Site C Clean Energy Project

Site C Reservoir (Mon-8) and Peace River (Mon-9) Water and Sediment Quality Monitoring Program

Task 2a – Water and Sediment Quality

Construction Year 8 (2022)

Kevin Ganshorn, M.Sc., R.P.Bio.
Ecofish Research Ltd.

Raïssa Philibert, Ph.D.
Ecofish Research Ltd.

Christina Suzanne, M.Sc., P.Biol., R.P.Bio.
Ecofish Research Ltd.

Casey Doucet, M.A.Sc.
Ecofish Research Ltd.

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BC Hydro
333 Dunsmuir Street, 13th Floor
Vancouver, BC V6B 5R3

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Prepared by:

Ecofish Research Ltd. and Aski Reclamation LP

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For inquiries contact: Technical lead documentcontrol@ecofishresearch.com 250-334-3042

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Certification: *Certified - stamped version on file.*

Senior Reviewer:

Kevin Ganshorn, M.Sc., R.P.Bio. No. 2448

Biologist

Technical Leads:

Christina Suzanne, M.Sc., P.Biol., R.P.Bio. No. 3749

Aquatic Scientist

Raïssa Philibert, Ph.D.

Senior Water Quality Scientist

Casey Doucet, M.A.Sc.

Aquatic Scientist

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EXECUTIVE SUMMARY

In accordance with Provincial Environmental Assessment Certificate (EAC) Schedule B Condition No. 7[1] and Federal Decision Statement (FDS) Condition Nos. 8.4.3[2] and 8.4.4[3] for BC Hydro and Power Authority's (BC Hydro) Site C Clean Energy Project (the Project), BC Hydro has developed the Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program (FAHMFP; BC Hydro 2015). The FAHMFP is designed to monitor different aspects of Peace River fish habitat or the response of the Peace River fish community to the construction and operation of the Project. The Project is located along the Peace River near the City of Fort St. John between the Districts of Hudson's Hope and Taylor, BC.

The Site C Reservoir Water and Sediment Quality Monitoring Program (Mon-8) and the Peace River Water and Sediment Quality Monitoring Program (Mon-9) represent two components of the FAHMFP, and data collection for these programs represents one task (Task 2a) within each of Mon-8 and Mon-9. Mon-8 will investigate the effects of reservoir formation on water and sediment quality upstream of the Project, whereas Mon-9 will investigate the effects of the Project on water and sediment quality in the Peace River downstream of the Project. Mon-8 and Mon-9 were developed to monitor water and sediment quality in the Site C Reservoir and Peace River and to address the fisheries management questions listed in the FAHMFP; several years of data collection are required before the questions can be definitively addressed. This report is the fifth year of data collection for these two monitoring programs under the FAHMFP.

The Mon-8 study area includes eight sites in the Peace River and tributaries within the Site C Reservoir Reach, defined as the portion of the Peace River that will be inundated by the Project and includes the Peace River from the Peace Canyon Dam downstream to the Project, and those sections of the Halfway and Moberly rivers that will be inundated following reservoir creation. Two of the Mon-8 sites are reference sites that were selected to monitor water flowing into the Site C Reservoir Reach and they are located near the Dinosaur and Williston reservoirs near their outlets. The Mon-9 study area includes nine Peace River and tributary sites within the Downstream Reach, defined as the portion of the Peace River downstream of the Project to Many Islands, Alberta.

In 2022, water quality monitoring was conducted during six sampling events from early June to October at all 15 river sites (Peace River and tributaries) and two reservoir sites (Williston and Dinosaur). Water quality sampling consisted of collecting in situ measurements and samples for laboratory analysis for a full suite of water quality parameters (including physical tests,

[1] The EAC Holder must develop a Fisheries and Aquatic Habitat Monitoring and Follow-up Program to assess the effectiveness of measures to mitigate Project effects on healthy fish populations in the Peace River and tributaries, and, if recommended by a Qualified Environmental Professional (QEP) or the BC Ministry of Forests, Lands and Natural Resources Operations (FLNR), to assess the need to adjust those measures to adequately mitigate the Project's effects.

[2] "The plan shall include: an approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area."

[3] "The plan shall include: an approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and fish habitat."

nutrients, anions, organic carbon, chlorophyll-*a*, total metals, and dissolved metals; total and dissolved metals are only measured in the first and last sampling month of the year). Water quality data were screened against the applicable short-term maximum BC Water Quality Guidelines for the Protection of Aquatic Life (BC WQG-AL). Sediment quality monitoring was conducted during one sampling event in October at all 15 river sites (Peace River and tributaries) and two reservoir sites (Williston and Dinosaur). Sediment quality samples were collected for laboratory analysis from nearshore depositional areas at each site using a grab sampling device or shovel, and were collected from surficial sediments (i.e., top 5 cm). Sediment quality parameters were laboratory-analyzed and included particle size, nutrients, organic/inorganic carbon, physical tests, and metals. Sediment quality data were screened against the BC Working Sediment Quality Guidelines (BC WSQG) for Freshwater Aquatic Life.

Within the Site C Reservoir Reach, exceedances of the BC WQG-AL were only observed for total iron, total zinc, and dissolved oxygen. These water quality parameters were also exceeded in the Downstream Reach where dissolved iron and total silver were also above the BC WQG-AL. Instances where dissolved oxygen concentrations did not meet the 9 mg/L BC WQG-AL minimum applicable level to buried embryo and alevin life stages were prevalent throughout all sampling periods, while metal exceedances only occurred during freshet in early June. Consistent with results from previous years, elevated concentrations and increased variability of water quality parameters were generally observed during freshet.

All sediment quality parameters met the BC Working Freshwater Probable Effect Level, and most parameters met the BC Working Freshwater Interim Sediment Quality Guideline, except for arsenic, cadmium, nickel, copper, and iron. Exceedances of arsenic, cadmium, and nickel were common throughout the Upstream Reservoirs, Site C Reservoir Reach, and Downstream Reach of the Peace River.

Overall, the objectives of Mon-8 and Mon-9 in 2022 were successfully met by contributing to the FAHMFP through characterizing the water and sediment quality conditions within the Peace River and its tributaries as it relates to the Project.

ACKNOWLEDGEMENTS

We acknowledge this research was conducted on the traditional territory of Treaty 8 First Nations of Dunne Zaa, Cree, and Tse'khene cultural descent.

Site C Reservoir and Peace River Water and Sediment Quality Monitoring (Task 2a) is funded by BC Hydro's Site C Clean Energy Project. Ecofish Research Ltd. and Aski Reclamation LP would like to thank the following individuals for their contributions to the program:

BC Hydro

Michael McArthur Vancouver, BC
Dave Hunter Vancouver, BC
Brent Mossop Vancouver, BC
Nich Burnett Vancouver, BC

The following employees of Ecofish Research Ltd. and Aski Reclamation LP contributed to the collection of data and preparation of this report:

Kevin Ganshorn	Biologist/Project Director/Reviewer	Luke Storey	Environmental Technician
Duane Coombs	Project Manager	Brendan Armstrong	Environmental Technician
Agoziem Okoye	Project Manager	Paula Lane	Office Administration
Regina Krohn (Aski)	Project Manager	Nicole Wolsey (Aski)	Environmental Technician
Raïssa Philibert	Senior Water Quality Scientist	Casey Doucet	Aquatic Scientist
Christina Suzanne	Aquatic Scientist	Sarah Kennedy	Environmental Technician/ Task Manager
Julian Krick	Senior Environmental Technician	Tess Ward	Environmental Technician
Patrick Beaupre (Aski)	Biological Technician	John Humphries	Project Coordinator
Brad Minielly	GIS Analyst/ Environmental Technician	Tera Kasubuchi	Environmental Technician/ Data Manager
Leah Hull	Environmental Technician/Task Manager	Larissa Clayton (Aski)	Environmental Technician

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	Description
# Exc	Number of exceedances of guideline
%	Percent
<	Less than
>	Greater than
±	Plus or minus
×	Times
°C	Degrees Celsius
ALS	ALS Environmental
Aski	Aski Reclamation LP
Avg.	Average
BC	British Columbia
BC ENV	BC Ministry of Environment and Climate Change Strategy
BC Hydro	BC Hydro and Power Authority
BC MOE	BC Ministry of Environment
BC WQG-AL	BC Water Quality Guidelines for the Protection of Aquatic Life
BC WSQG	BC Working Sediment Quality Guidelines
CALA	Canadian Association for Laboratory Accreditation
CCME	Canadian Council of Ministers of the Environment
DO	Dissolved oxygen
DOC	Dissolved organic carbon
EAC	Environmental Assessment Certificate
EBA	Economic Benefits Agreement
Ecofish	Ecofish Research Ltd.
EDQA	Environmental Data Quality Assurance
EHT	Exceeded ALS recommended hold time prior to analysis
EHTR	Exceeded ALS recommended hold time prior to sample receipt
EIS	Site C Environmental Impact Statement
EQ	Equation
FAHMFP	Fisheries and Aquatic Habitat Monitoring and Follow-up Program
FDS	Federal Decision Statement
FLNR	BC Ministry of Forests, Lands and Natural Resources Operations
GIS	Geographic Information System
Golder	Golder Associates Ltd.
Gov BC	Government of BC
ISQG	Interim Sediment Quality Guideline
km	Kilometre
m	Metre
Max.	Maximum

Acronym	Description
MDL	Method detection limit
Med.	Median
mEq/L	Milliequivalents per litre
mg/kg	Milligram per kilogram
mg/L	Milligram per litre
Min.	Minimum
mm	Millimetre
Mon-6	Site C Reservoir Fish Food Organisms Monitoring Program
Mon-7	Peace River Fish Food Organisms Monitoring Program
Mon-8	Site C Reservoir Water and Sediment Quality Monitoring Program
Mon-9	Peace River Water and Sediment Quality Monitoring Program
mV	Millivolt
n	Sample size
n<MDL	Number of samples below the MDL
NAD	North American Datum
NTU	Nephelometric turbidity unit
PEL	Probable effect level
ppt	Parts per thousand
QA/QC	Quality assurance and quality control
QEP	Qualified Environmental Professional
RFQ	Request for quotation
RISC	Resource Inventory Standards Committee
RPD	Relative percent difference
RSD	Relative standard deviation
SD	Standard deviation
SEES JV	Saulteau EBA Environmental Services Joint Venture
Task 2a	Site C Reservoir and Peace River Water and Sediment Quality Monitoring
TCU	True colour unit
TDS	Total dissolved solids
TEL	Threshold effect level
the Project	Site C Clean Energy Project
TOC	Total organic carbon
TSS	Total suspended solids
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WQG	Water quality guidelines
WSQG	Working sediment quality guidelines
µg/L	Microgram per litre
µS/cm	Microsiemens per centimetre

1. INTRODUCTION

In accordance with Provincial Environmental Assessment Certificate (EAC) Schedule B Condition No. 7[1] and Federal Decision Statement (FDS) Condition Nos. 8.4.3[2] and 8.4.4[3] for BC Hydro and Power Authority's (BC Hydro) Site C Clean Energy Project (the Project), BC Hydro has developed the Site C Fisheries and Aquatic Habitat Monitoring and Follow-up Program (FAHMFP; BC Hydro 2015). The FAHMFP is designed to monitor different aspects of Peace River fish habitat or the response of the Peace River fish community to the construction and operation of the Project. The Project is located along the Peace River near the City of Fort St. John between the Districts of Hudson's Hope and Taylor, BC.

The Site C Reservoir Water and Sediment Quality Monitoring Program (Mon-8) and the Peace River Water and Sediment Quality Monitoring Program (Mon-9) represent two components of the FAHMFP, and data collection for these programs represents one task (Task 2a) within each of Mon-8 and Mon-9. Mon-8 will investigate the effects of reservoir formation on water and sediment quality upstream of the Project (Map 1), whereas Mon-9 will investigate the effects of the Project on water and sediment quality in the Peace River downstream of the Project as far as the Many Islands area in Alberta, a distance of approximately 120 km (Map 2). Reference sites will monitor water flowing into the reach of the Peace River upstream of the Project from Dinosaur and Williston reservoirs, and into the Peace River via tributaries that are located both upstream and downstream of the Project. These two programs will collect information to support the interpretation of the Project's effects on water and sediment quality and ultimately on fish and fish habitat upstream and downstream of the Project during both Project construction and operation.

In the Site C Environmental Impact Statement (EIS), concentrations of total suspended solids (TSS), dissolved oxygen (DO), and nutrients (orthophosphate, ammonia, and nitrate) were predicted for Dinosaur Reservoir and for the Peace River upstream and downstream of the Project. The level of uncertainty regarding predictions was considered to be moderate[4]. Data from Mon-8 and Mon-9 will be used to evaluate predictions of these water quality parameters. Data collected as part of these programs will be used to confirm predictions of these water quality parameters, address uncertainties regarding the Project's effects on fish and fish habitat during both Project construction and operation,

[1] The EAC Holder must develop a Fisheries and Aquatic Habitat Monitoring and Follow-up Program to assess the effectiveness of measures to mitigate Project effects on healthy fish populations in the Peace River and tributaries, and, if recommended by a Qualified Environmental Professional (QEP) or the BC Ministry of Forests, Lands and Natural Resources Operations (FLNR), to assess the need to adjust those measures to adequately mitigate the Project's effects.

[2] "The plan shall include: an approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area."

[3] "The plan shall include: an approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and fish habitat."

[4] EIS, Volume 2, Appendix P, Part 2.

and assess the effectiveness of fish and fish habitat mitigation. The temporal scope of these programs encompasses Construction Years 2 to 9 and Operation Years 1 to 10.

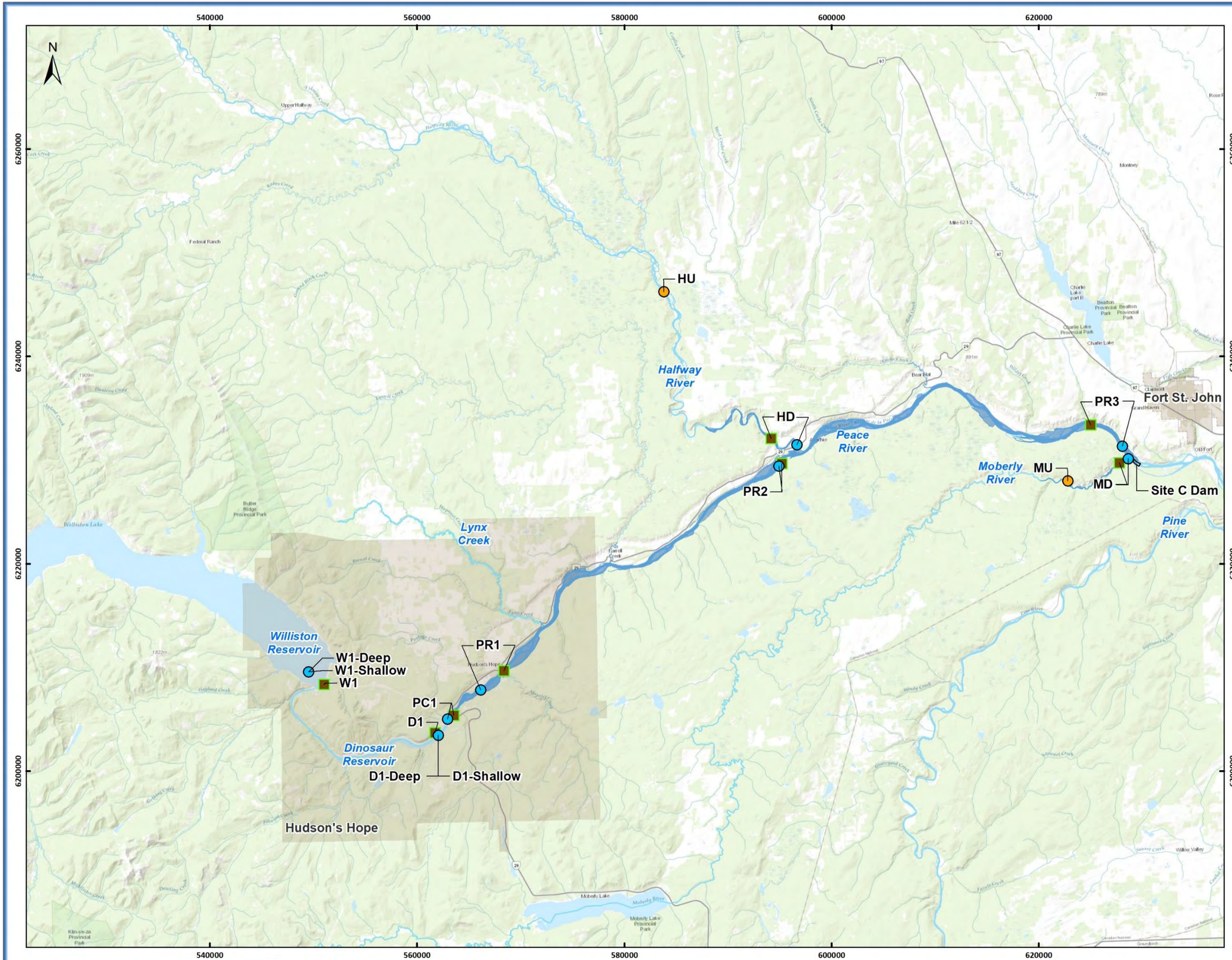
Data from water quality samples will be used by the Site C Reservoir Fish Food Organisms Monitoring Program (Mon-6) and the Peace River Fish Food Organisms Monitoring Program (Mon-7); therefore, these samples are expected to be collected between May and October of each study year to ensure compatibility with that program. Water quality sampling will focus on measuring parameters that may change in concentration throughout the growing season. Sampling will generally follow the parameters collected during baseline sampling. General water quality sampling includes a mixture of field-based measured parameters (e.g., specific conductivity (µS/cm), pH, redox potential (mV), and DO (mg/L % saturation), and collection of samples for laboratory analysis of nutrients and general parameters.

Sediment will be collected from surficial sediments (i.e., top 5 cm) in depositional areas (i.e., areas of predominantly fine substrates). Samples will be analyzed for particle size, nutrients, and total metals. These samples will be collected during the fall to collate sediment data with data collected under Mon-6 and Mon-7.

Prior to 2022, Saulteau EBA Environmental Services Joint Venture (SEES JV) conducted the water and sediment quality sampling and reporting for Task 2a of Mon-8 and Mon-9. SEES JV conducted sampling each year from 2016 to 2019 (Construction Years 2 to 5). Mon-8 and Mon-9 were suspended in 2020 and 2021 (Construction Years 6 and 7) during the Covid-19 pandemic. Sampling resumed in 2022 (Construction Year 8), with Ecofish Research Ltd. (Ecofish) and Aski Reclamation LP (Aski) conducting the water and sediment quality sampling and reporting. This report is an overview of the Mon-8 and Mon-9 sampling conducted in Construction Year 8 (2022).

SITE C CLEAN ENERGY PROJECT

Site C Mon-8 Water Quality and Sediment Quality Monitoring Locations



Legend

- Water Quality
- Sediment Quality
- Post-Inundation Monitoring Site
- Site C Dam
- Future Site C Reservoir
- Cities
- Highway
- Municipalities

MAP SHOULD NOT BE USED FOR LEGAL OR NAVIGATIONAL PURPOSES

0 2.5 5 10 15 km

Scale: 1:350,000

NO.	DATE	REVISION	BY
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2			
3			
4			
5			

Date Saved: 2023-07-05
Coordinate System: NAD 1983 UTM Zone 10N

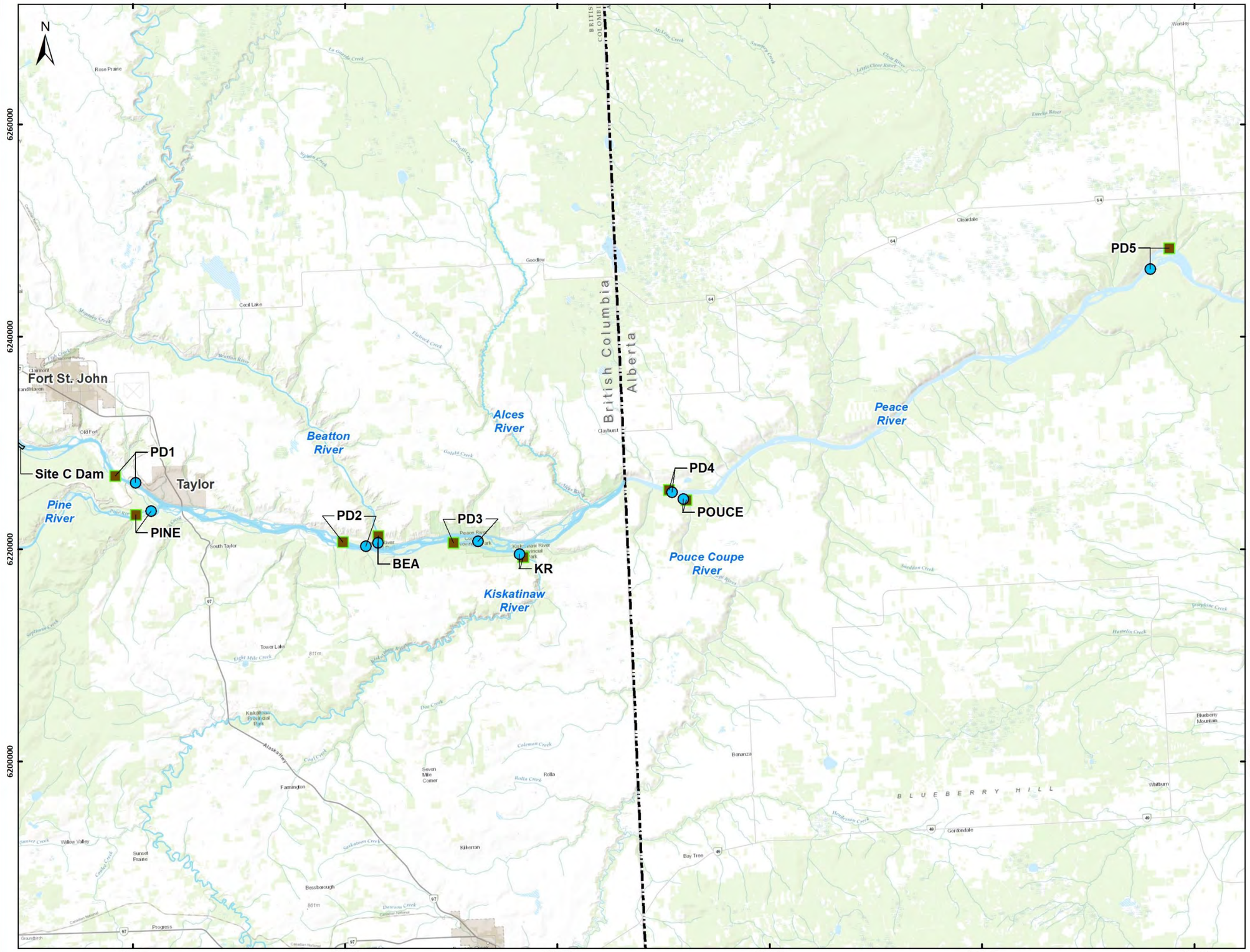
ECOFISH RESEARCH

Map 1

Path: M:\Projects-Active\1200_SiteC\MXD\WaterQuality\1200_STC_Mon8Mon9_Sites_5718_20230705.mxd

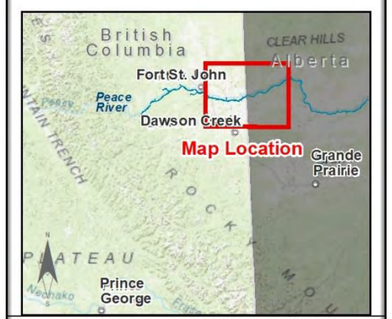
SITE C CLEAN ENERGY PROJECT

Site C Mon-9 Water Quality and Sediment Quality Monitoring Locations



Legend

- Water Quality
- Sediment Quality
- Site C Dam
- BC-Alberta Border
- Cities
- Highway
- Municipalities



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Date Saved: 2023-07-05
Coordinate System: NAD 1983 UTM Zone 10N

ECOFISH RESEARCH

Map 2

Path: M:\Projects-Active\1200_SiteC\MXD\WaterQuality\1200_STC_Mon8Mon9_Sites_5718_20230705.mxd

1.1. Fisheries Management Questions

1.1.1. Mon-8

The primary fisheries management question to be addressed by this program is as follows:

- Does the construction and operation of the Project affect fish and fish habitat (as measured through water and sediment quality) in the reservoir and lower sections of reservoir tributaries?

This broad question requires a number of smaller questions to be answered because of the various ways that the Project can affect fish and fish habitat:

1. Is there a change in water or sediment quality in the Site C reach during the construction of the Project?
2. Is there a change in water or sediment quality in the Site C reach during the operation of the Project?
3. How effective are proposed mitigation methods in maintaining/protecting water and sediment quality in the Site C reach?

1.1.2. Mon-9

The primary fisheries management question to be addressed by this program is as follows:

- Does the construction and operation of the Project affect fish and fish habitat (as measured through water and sediment quality) in the Peace River downstream of the Project?

This broad question requires a number of smaller questions to be answered because of the various ways that the Project can affect fish and fish habitat:

1. Is there a change in water or sediment quality in the Peace River between the Site C dam site and the Many Islands area in Alberta during the construction of the Project?
2. Is there a change in water or sediment quality in the Peace River between the Site C dam site and the Many Islands area in Alberta during the operation of the Project?
3. How effective are proposed mitigation methods in maintaining/protecting water and sediment quality in the Peace River between the Site C dam site and the Many Islands area in Alberta?

1.2. Management Hypotheses

1.2.1. Mon-8

This program focuses on monitoring that addresses the following hypotheses:

H_1: During construction, modeled water quality predictions presented in the EIS are similar to measured water quality in the Site C reach.

H_2: During operation, modeled water quality predictions presented in the EIS are similar to measured water quality in the Site C reach.

H_3: During construction, water and sediment quality for non-modeled parameters remain within background ranges of concentrations, or comply with relevant environmental guidelines[1] in the Site C reach.

H_4: During operation, water and sediment quality for non-modeled parameters remain within background ranges of concentrations, or comply with relevant environmental guidelines in the Site C reach.

Two hypotheses related to the effectiveness of mitigation measures for water and sediment quality.

H_5: During construction, mitigation methods employed are effective in maintaining/protecting water and sediment quality in the Site C reach.

H_6: During operation, mitigation methods employed are effective in maintaining/protecting water and sediment quality in the Site C reach.

1.2.2. Mon-9

This program focuses on monitoring that addresses the following hypotheses:

H_1: During construction, modeled water quality predictions presented in the EIS are similar to measured water quality in the Peace River between the Site C dam site and the Many Islands area in Alberta.

H_2: During operation, modeled water quality predictions presented in the EIS are similar to measured water quality in the Peace River between the Site C dam site and the Many Islands area in Alberta.

H_3: During construction, water and sediment quality for non-modeled parameters remain within background ranges of concentrations, or comply with relevant environmental guidelines in the Peace River between the Site C dam site and the Many Islands area in Alberta.

H_4: During operation, water and sediment quality for non-modeled parameters remain within background ranges of concentrations, or comply with relevant environmental guidelines in the Peace River between the Site C dam site and the Many Islands area in Alberta.

Two hypotheses related to the effectiveness of mitigation measures for water and sediment quality.

H_5: During construction, mitigation methods employed are effective in maintaining/protecting water and sediment quality in the Peace River between the Site C dam site and the Many Islands area in Alberta.

H_6: During operation, mitigation methods employed are effective in maintaining/protecting water and sediment quality in the Peace River between the Site C dam site and the Many Islands area in Alberta.

[1] As described in the Construction Environmental Management Plan for the Project.

1.3. Key Mitigation and Offsetting Questions Affected

Information from these programs regarding water and sediment quality upstream and downstream of the Project, together with information from other components of the FAHMFP, will inform decisions on fish habitat in the reservoir and in the downstream Peace River. In addition, the information will be used to verify predictions in the EIS[1] and provide supporting data for conditions listed in the Provincial EAC[2] and the Federal Decision Statement[3].

2. METHODS

2.1. Monitoring Sites Overview

Historical pre-construction data collected in 2007, 2008, 2010, 2011, and 2015 were used as a design template to establish site locations, sampling frequency, and parameters analyzed for the programs. Historical data collected prior to 2015 are documented within the "Site C Clean Energy Project Environmental Impact Statement Technical Appendix: Water Quality Baseline Conditions in the Peace River Volume 2 Appendix E" (Golder 2012).

In Construction Year 8 (2022), water and sediment quality samples were collected from 17 sites located in the portion of the Peace River between the Peace Canyon Dam and the Many Islands area in Alberta and reference sites (Table 1 and Map 1 for Mon-8; Table 2 and Map 2 for Mon-9). Reference sites include those situated upstream in Dinosaur (D1) and Williston (W1) reservoirs and in several tributaries to the Peace River (Halfway and Moberly rivers upstream of Site C, and the Pine, Beatton, Kiskatinaw, and Pouce Coupe rivers downstream of Site C). All monitoring sites are accessible by boat via public boat launches (road accessible). Sites between the Peace River Canyon Dam and the Project are in the Site C Reservoir Reach, while those between the Project and the Many Islands area in Alberta are in the Downstream Reach.

The Site C Reservoir Reach is defined as the portion of the Peace River that will be inundated by the Project and includes the Peace River from the Peace Canyon Dam downstream to the Project, and those sections of the Halfway and Moberly rivers that will be inundated following reservoir creation (approximately 15 km in the Halfway River and 12 km in the Moberly River). There is an upstream site in each of Williston and Dinosaur reservoirs, and four sites in the Peace River between Peace Canyon Dam and the Project. There are two sites within each of the Halfway and Moberly rivers; however, only the lower site which will be located in the footprint of the Site C Reservoir will be sampled during construction; following construction an additional site in the Halfway and Moberly rivers upstream of the influence of the reservoir will be sampled.

[1] EIS, Volume 2, Section 12.

[2] EAC, Condition #7, Pages 8 to 9.

[3] Decision Statement, October 14, 2014, Section 8 Fish and Fish Habitat.

The Downstream Reach is defined as the portion of the Peace River and tributaries located downstream of the Project to the Many Islands area in Alberta, approximately 120 km. There are five sites in the Peace River in this reach, and sites in the lower portion of four tributaries just upstream of their confluence with the Peace River (Pine, Beatton, Kiskatinaw, and Pouce Coupe rivers).

Table 1. Mon-8 upstream reservoir, Peace River, and tributary water quality and sediment quality sampling site description, location, and sampling dates.

Site Abbreviation	Description	UTM Coordinates (m)					Sampling Dates	
		Zone	Water Quality		Sediment Quality		Water Quality	Sediment Quality
			Easting	Northing	Easting	Northing		
W1-Shallow and W1-Deep	Williston Reservoir reference site. Water quality samples collected 0.2 m (W1-Shallow) and 5 m (W1-Deep) below the surface at the same site as W-01 in Golder (2012).	10V	549,540	6,209,610	551,011	6,208,398	01-Jun-22, 27-Jun-22, 25-Jul-22, 16-Aug-22, 23-Sep-22, 19-Oct-22	19-Oct-22
D1-Shallow and D1-Deep	Dinosaur Reservoir reference site. Water quality samples collected 0.2 m (D1-Shallow) and 5 m (D1-Deep) below the surface.	10V	562,028	6,203,491	561,712	6,203,713	01-Jun-22, 27-Jun-22, 25-Jul-22, 16-Aug-22, 23-Sep-22, 19-Oct-22	19-Oct-22
PC1[1]	Upper boundary of the Site C Local Assessment Area in the Peace River below Peace Canyon Dam.	10V	562,934	6,205,050	563,532	6,205,417	02-Jun-22, 26-Jul-22, 17-Aug-22, 21-Sep-22, 21-Oct-22	21-Oct-22
PR1	Upper Site C reservoir near the community of Hudson's Hope. Same as Peace-01 site from Golder (2012).	10V	566,122	6,207,857	568,356	6,209,693	02-Jun-22, 28-Jun-22, 26-Jul-22, 17-Aug-22, 21-Sep-22, 21-Oct-22	18-Oct-22
PR2	Middle Site C Reservoir upstream of the Halfway River confluence. Same as Peace-02 site from Golder (2012).	10V	594,889	6,229,426	624,989	6,233,415	02-Jun-22, 28-Jun-22, 26-Jul-22, 18-Aug-22, 21-Sep-22, 21-Oct-22	21-Oct-22
HU	In the Halfway River upstream of the Project. After reservoir creation, this site will monitor water quality upstream of the Site C reservoir embayment that will be created by the inundation of the Halfway River. This site will only be monitored after inundation.							
HD	Halfway River, downstream site. After reservoir creation, this site will monitor water quality in the reservoir embayment created by the inundation of the Halfway River. Same as Halfway-DS from Golder (2012).	10V	596,649	6,231,488	594,140	6,232,115	02-Jun-22, 28-Jun-22, 26-Jul-22, 18-Aug-22, 21-Sep-22, 21-Oct-22	21-Oct-22
PR3[2]	Peace 3 site, lower Site C Reservoir upstream of the Moberly River confluence. Same as Peace-03 in Golder (2012).	10V	627,372	6,232,207	595,196	6,229,687	03-Jun-22, 28-Jun-22, 26-Jul-22, 18-Aug-22, 20-Sep-22, 18-Oct-22	21-Oct-22
MU	In the Moberly River upstream of the Project. After reservoir creation, this site will monitor water quality upstream of the Site C reservoir embayment created by the inundation of the Moberly River. This site will only be monitored after inundation.							
MD	In the Moberly River whose confluence with the Peace River is upstream of the Project. After reservoir creation, this site will monitor water quality in the reservoir embayment created by the inundation of the Moberly River. Same as Moberly-DS in Golder (2012).	10V	628,620	6,230,146	627,763	6,229,742	03-Jun-22, 27-Jun-22, 25-Jul-22, 22-Aug-22, 20-Sep-22, 18-Oct-22	18-Oct-22

[1] PC1 was inaccessible due to low river flows when sampling was attempted on June 28, 2022

[2] Prior to September 2020 (i.e., prior to Peace River diversion), PR3 water quality was located at 628,028 E, 6,231,374 m N. Following river diversion, the site was inaccessible due to the presence of a debris boom, and has been relocated after September 2020 to ~2.1 km upstream of the original site at the coordinates provided in the table.

Table 2. Mon-9 Peace River and tributary water quality and sediment quality sampling site description, location, and sampling dates.

Site Abbreviation	Description	UTM Coordinates (m)					Sampling Dates	
		Zone	Water Quality		Sediment Quality		Water Quality	Sediment Quality
			Easting	Northing	Easting	Northing		
PD1	Peace River downstream of Site C and immediately upstream of Pine River confluence. Located ~1.44 km upstream of the Peace-04 site from Golder (2012).	10V	640,247	6,226,276	638,312	6,226,922	03-Jun-22, 29-Jun-22, 27-Jul-22, 19-Aug-22, 22-Sep-22, 22-Oct-22	22-Oct-22
PINE	In the Pine River whose confluence with the Peace River is downstream of the Project.	10V	641,710	6,223,596	640,293	6,223,259	03-Jun-22, 29-Jun-22, 27-Jul-22, 19-Aug-22, 22-Sep-22, 22-Oct-22	22-Oct-22
PD2	Peace River downstream of the Pine River confluence and upstream of the Beatton River confluence with the Peace River. Located ~700 m upstream of the Peace-14 site from Golder (2012).	10V	661,946	6,220,293	659,757	6,220,678	03-Jun-22, 29-Jun-22, 27-Jul-22, 19-Aug-22, 19-Sep-22, 20-Oct-22	20-Oct-22
BEA	In the Beatton River whose confluence with the Peace River is downstream of the Project.	10V	663,060	6,220,613	663,114	6,221,245	03-Jun-22, 29-Jun-22, 27-Jul-22, 19-Aug-22, 19-Sep-22, 17-Oct-22	17-Oct-22
PD3	Peace River downstream of the Beatton River confluence and upstream of the Kiskatinaw River confluence with the Peace River. Located ~ 175 m downstream of the Peace-15 site from Golder (2012).	10V	672,509	6,220,751	670,198	6,220,627	04-Jun-22, 29-Jun-22, 27-Jul-22, 23-Aug-22, 19-Sep-22, 20-Oct-22	20-Oct-22
KR	In the Kiskatinaw River whose confluence with the Peace River is downstream of the Project.	10V	676,408	6,219,559	676,772	6,219,255	04-Jun-22, 29-Jun-22, 27-Jul-22, 23-Aug-22, 19-Sep-22, 17-Oct-22	17-Oct-22
PD4	Peace River downstream of the confluence with the Alces River and upstream of the Pouce Coupe River confluence with the Peace River.	11V	317,951	6,224,982	317,680	6,225,246	04-Jun-22, 29-Jun-22, 27-Jul-22, 23-Aug-22, 19-Sep-22, 17-Oct-22	17-Oct-22
POUCE	In the Pouce Coupe River whose confluence with the Peace River is downstream of the Project.	11V	318,943	6,224,275	319,217	6,224,136	04-Jun-22, 29-Jun-22, 27-Jul-22, 23-Aug-22, 19-Sep-22, 17-Oct-22	17-Oct-22
PD5	Peace River near Many Islands, Alberta. This site is the lower boundary of the Site C Local Assessment Area.	11V	364,652	6,242,006	366,595	6,243,813	04-Jun-22, 30-Jun-22, 28-Jul-22, 24-Aug-22, 20-Sep-22, 20-Oct-22	20-Oct-22

2.2. Field Methods

2.2.1. Overview

Standard practices available from the BC Field Sampling Manual (Part E: Water and Wastewater Sampling; Gov BC 2013 and Part D2: Sediment Sampling; Gov BC 2020) were used to develop the procedures described below for water (Section 2.2.2) and sediment quality (Section 2.2.3) sampling, respectively. Furthermore, water and sediment quality sampling protocols were consistent with methods used in previous years of sampling for the program (e.g., SEES JV 2020a) to maintain data continuity.

2.2.2. Water Quality

During the six sampling events in 2022 (early June[1], late June, July, August, September, and October; also referred to as sampling periods in this report), water quality samples were collected at all 15 river sites and two reservoir sites (Williston and Dinosaur) listed in Table 1 and Table 2. No samples were collected from site PC1 in late June due to accessibility issues related to low water levels in the Peace River at the time of sampling. Water quality samples were collected in the main flow of the channel away from watercourse banks for river sites when conditions allowed, and areas with unusual flow characteristics (e.g., eddies or backwater areas) or floating debris were avoided.

Water quality sampling consisted of collecting in situ measurements and samples for laboratory analysis. Sampling was typically conducted from a boat; however, in shallower waters, sampling was conducted by wading into the channel or using a telescopic metal pole from shore. Where boat sampling was conducted, samples were collected off the side of the middle of the boat, with the boat pointed upstream to collect water that had not been influenced by the boat. When wading, the sampler collected samples from upstream of where they were wading. Where samples were collected by wading or from shore with a pole, care was taken to collect samples from representative flowing water conditions.

The following in situ water quality parameters were field measured at 0.2 m below the surface in triplicate for all river and reservoir sites: water temperature (°C), DO (mg/L, % saturation), specific conductivity (µS/cm), electrical conductivity (µS/cm), salinity (ppt), total dissolved solids (TDS; mg/L), pH (pH units), redox potential (mV), and turbidity (NTU). All parameters were measured using a YSI ProDSS Multimeter. Sample depth (m) and total depth (m) were also measured at each site using a sonar (i.e., fish finder). At the reservoir sites, water transparency was recorded by measuring the depth of visibility of a Secchi disk. Additional in situ measurements (including all parameters listed above) were collected in triplicate from the reservoir sites at the following depths (meters below water surface): 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0 as per the requirements of the Request for Quotation (RFQ; BC Hydro 2019).

[1] Due to sampling logistics, water quality sites were not sampled in May 2022, as planned under Mon - 8/9 (BC Hydro 2015); sampling was conducted in both early June and late June instead.

In 2022, a silicone intake tube, a peristaltic pump (Waterra Spectra Field Pro Peristaltic Pump), and a silicone outlet tube were used to fill the sample bottles, and for parameters that require filtration, a Pall Gelman GWV high-capacity groundwater 0.45 µm filter was installed on the outlet tube. A new filter was used at each sample site. This methodology marks a change from the equipment that was previously used under Mon-8/9. SEES JV (2020a) states:

> "In September 2017, as per BC Hydro direction, collection by grab sampling (i.e., submerging sample bottle directly into flow 0.2 m below surface from the side of the vessel) was replaced by a peristaltic pump and HDPE tubing with a 5 m intake length. In October 2017, the peristaltic pump was replaced with an electric diaphragm-operated pump (Pentair Shurflo; Model 4048-153-E75) and inert platinum-rinsed silicone tubing operating at 15 L/minute. The purpose of this apparatus was for collecting and analyzing low-level concentrations of dissolved and total forms of mercury and methylmercury but was inherently used for collecting all water samples. The extension of the tubing allowed samples to be collected at least 5 m away from the aluminum hull of the jet boat, which could impact the results of low-level metals analysis."

In 2020, Ecofish began conducting monitoring for a scope of water quality work in relation to the City of Fort St. John and the District of Taylor water supplies that was previously carried out for BC Hydro by SEES JV (SEES JV 2020b). At this time, Ecofish inherited the Pentair Shurflo pump that SEES JV had been using for Mon-8 and Mon-9. Ecofish observed that the pressure exerted by the Pentair Shurflo pump, 15 L/min, rated at 65 PSI was above the specifications for the inline 0.45 µm Gelman GWV filters (i.e., 50 psi according to the specification sheet provided by Hoskins Scientific). Pressure exerted by the pump could therefore result in sample contamination for dissolved parameters due to filter break through. Furthermore, the Pentair pump was subject to contamination itself; unlike a peristaltic pump, sample water enters internal parts of the Pentair pump and it was found that suspended sediment would accumulate inside the pump thereby affecting its performance on occasion. The sampling program that SEES JV had been doing in relation to the City of Fort St. John and the District of Taylor scope of work identified field blank detections and higher DOC concentrations compared to TOC concentrations as an ongoing QA/QC issue which persisted when Ecofish began using the Pentair pump in 2020 (Ganshorn *et al.* 2021). These detections were low and unlikely to impact sample results; however, the cause of the detections was previously unclear.

For the sampling that SEES JV did for the City of Fort St. John and the District of Taylor water supplies, the Pentair Shurflo Model 4048 pump was replaced with a Waterra Spectra Field Pro Peristaltic Pump in September 2021 to meet the psi rating of the inline filters. The Waterra pump has a low flow rate ranging from 0.050 L/min to 1.9 L/min. The Waterra pump was rented from Hoskin Scientific for the September 2021 sampling event and the same model was purchased for use in November 2021 and moving forward in the monitoring program. The maximum theoretical vacuum that a peristaltic pump can create is -1 atmosphere, which at sea level is equal to 14.7 psi (https://waterra.com/peristaltic-groundwater-sampling-pump/). When Ecofish was using the Pentair pump in the water supply sampling program, there was detection of 13.5% of parameters in the field blanks in 2020 (Ganshorn *et al.* 2021); however, after switching to the Waterra pump, detections in

field blanks were reduced to only 3.3% of parameters (Ganshorn *et al.* In Prep), similar to what was observed for Mon-8/9 in 2022 (3.4% of parameters in the field blanks had detections, Table 7).

Upon arrival at a sample site for Mon-8/9, the tubing used with the peristaltic pump was flushed with river water for 15 minutes prior to sample collection, and each filter was flushed with a minimum of 2 L of river water to clear any residual carbon from the filters prior to sample collection. In most cases, sites were accessible by boat and samples were collected upstream of any effects related to the boat/boat motor, in the main flow of the watercourse away from any back eddy effects or floating debris. Occasionally, tributary flow was considered too low for boat access, at which point field staff collected samples by wading into the edge of the main flow and sampling from upstream of where the technician was standing. Samples were stored in coolers with ice packs and delivered to the ALS Environmental (ALS) depot in Fort St. John following standard chain of custody procedures. Samples were then shipped to ALS in either Calgary or Vancouver for analysis.

Water quality samples for laboratory analysis were collected from the surface (0.2 m depth) at all sites, as well as from a depth of 5.0 m at the reservoir sites using a peristaltic pump and were sent to ALS for analysis. Decontamination of tubing for the peristaltic pump was completed at each site by running source water through the tubing for a minimum of 15 minutes prior to sampling. Reservoir samples were collected at least 25 m from the shoreline. Laboratory water quality parameters analyzed in 2022 are presented in Table 3 and Table 4, including both total and dissolved metals (early June and October sampling events only), and physical tests, anions, nutrients, and organic carbon (collected during all six sampling events). In addition, chlorophyll-*a* samples were collected from surface (0.2 m depth) and deep (5.0 m depth) sites in the reservoirs during each of the six sampling events. Chlorophyll-*a* is commonly used as an indicator of algal abundance and productivity in aquatic environments. On occasion, water quality parameters that were requested for analysis in the RFQ (BC Hydro 2019) were not measured in situ or analyzed at the laboratory for a specific site or sampling period; further details on these instances are described in Section 3.2.4.

In situ and laboratory sampling procedures, chain of custody procedures, and quality assurance and quality control (QA/QC) procedures adhered to the guidelines of the BC Field Sampling Manual (Gov BC 2013). Site photos were collected and archived for all sites, and detailed information (e.g., location, date and time, persons involved) was recorded for all data collected. In addition, data screening and management followed the QA/QC procedures outlined below in Section 2.4. Typically, triplicate readings were collected for in situ data, and two duplicate samples, one field blank, and one travel blank for laboratory analysis were also collected for each sampling event, consistent with SEES JV (2020a).

Table 3. Anions, nutrients, organic carbon, physical tests, and chlorophyll-*a* water quality parameters analyzed in samples collected from Mon-8/9 monitoring sites in 2022.

Scheduled Sampling Events	Analyte Group	Parameter	Units	Method Detection Limits
Early June, late June, July, August, September, and October	Anions and Nutrients	Ammonia, Total (as N)	mg/L	0.0050
		Chloride (Total)		0.50 - 2.5
		Fluoride (F)		0.020 - 0.10
		Nitrate (as N)		0.0050 - 0.025
		Nitrite (as N)		0.0010 - 0.0050
		Orthophosphate - Dissolved (as P)		0.0010
		Phosphorus (P) - Total[1]		0.0020 - 0.040
		Phosphorus (P) - Total Dissolved		0.0020
		Silicate (as SiO_2)		0.50
		Sulfate (SO_4)		0.30 - 1.5
		Total Kjeldahl Nitrogen		0.050 - 0.30
		Total Nitrogen		0.030 - 0.30
	Ion Balance[2]	Anion Sum	mEq/L	0.10
		Cation - Anion Balance	% difference	0.010
		Cation Sum	mEq/L	0.10
	Organic Carbon	Dissolved Organic Carbon	mg/L	0.50 - 1.0
		Total Organic Carbon		0.50 - 2.5
	Physical Tests	Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	1.0
		Alkalinity, Carbonate (as $CaCO_3$)		1.0
		Alkalinity, Hydroxide (as $CaCO_3$)		1.0
		Alkalinity, Total (as $CaCO_3$)		1.0
		Dissolved Hardness (as $CaCO_3$)		0.50 - 0.60
		Total Dissolved Solids		10 - 20
		Total Suspended Solids		3.0 - 7.5
		Colour, True	TCU[3]	5.0 - 50
		Specific Conductivity (lab)	µS/cm	2.0
		pH (lab)	pH units	0.10
	Plant Pigments	Chlorophyll-*a*[4]	µg/L	0.010 - 0.028

[1] Phosphorus (P) - Total was analyzed using two different methods having different method detection limit ranges.

[2] Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not requested as part of the RFQ but were included for the late June, August, September, and October sampling events.

[3] TCU = True Colour Units.

[4] Requested only for samples collected from the reservoir sites (Williston and Dinosaur) as part of the RFQ.

Table 4. Dissolved and total metals water quality parameters analyzed in samples collected from Mon-8/9 monitoring sites in 2022.

Scheduled Sampling Events	Parameter	Method Detection Limits (mg/L)	
		Dissolved Metals	Total Metals
Early June and October	Aluminum (Al)	0.0010	0.0030
	Antimony (Sb)	0.00010	0.00010
	Arsenic (As)	0.00010	0.00010
	Barium (Ba)	0.00010	0.00010
	Beryllium (Be)	0.000020	0.000020 - 0.00010
	Bismuth (Bi)	0.000050	0.000050
	Boron (B)	0.010	0.010
	Cadmium (Cd)	0.0000050	0.0000050
	Calcium (Ca)	0.050 - 0.10	0.050
	Cesium (Cs)	0.000010	0.000010
	Chromium (Cr)	0.00050	0.00050
	Cobalt (Co)	0.00010	0.00010
	Copper (Cu)	0.00020	0.00050
	Ferrous Iron (Fe (II))	0.020	-
	Iron (Fe)	0.010	0.010
	Lead (Pb)	0.000050	0.000050
	Lithium (Li)	0.0010	0.0010
	Magnesium (Mg)	0.0050 - 0.010	0.0050
	Manganese (Mn)	0.00010	0.00010
	Mercury (Hg)	0.00000050	0.00000050 - 0.000020
	Methylmercury (MeHg)	0.000000020 - 0.000000040	0.000000020 - 0.00000020
	Molybdenum (Mo)	0.000050	0.000050
	Nickel (Ni)	0.00050	0.00050
	Phosphorus (P)	0.050	0.050
	Potassium (K)	0.050	0.050
	Rubidium (Rb)	0.00020	0.00020
	Selenium (Se)	0.000050	0.000050
	Silicon (Si)	0.050	0.10
	Silver (Ag)	0.000010	0.000010 - 0.000030
	Sodium (Na)	0.050	0.050
	Strontium (Sr)	0.00020	0.00020
	Sulfur (S)	0.50	0.50
	Tellurium (Te)	0.00020	0.00020
	Thallium (Tl)	0.000010	0.000010
	Thorium (Th)	0.00010	0.00010
	Tin (Sn)	0.00010	0.00010
	Titanium (Ti)	0.00030	0.00030 - 0.0081
	Tungsten (W)	0.00010	0.00010
	Uranium (U)	0.000010	0.000010
	Vanadium (V)	0.00050	0.00050
	Zinc (Zn)	0.0010	0.0030
	Zirconium (Zr)	0.00030 - 0.00090	0.00020 - 0.00060

Dashes (-) indicate that the parameter was not analyzed.

2.2.3. Sediment Quality

Sediment quality samples were collected in October 2022 from each of the 15 river sites and two reservoir sites (Williston and Dinosaur) listed in Table 1 and Table 2. Sediment quality samples were collected from nearshore depositional areas (i.e., areas of predominantly fine substrates) at each river and reservoir sampling site using a grab sampling device (i.e., petite Ponar), and were exclusively collected from surficial sediments (i.e., top 5 cm). When conditions were not suitable for grab sampling, samples were collected using a small, spaded shovel as per SEES JV (2020a). Sample depth (m) was also recorded. Sediment quality samples were composited in the field from three grabs at each site and mixed in a stainless-steel bowl using a stainless-steel spoon and sent to ALS where they were analyzed for the sediment quality parameters listed in Table 5. Sampling equipment was washed with Liquinox soap using deionized water, then rinsed clean with deionized water in between samples.

Sediment quality sampling procedures, chain of custody procedures, and QA/QC procedures adhered to the guidelines of the BC Field Sampling Manual (Part D2: Sediment Sampling; Gov BC 2020). Site photos were collected and archived for all sampling sites, and detailed information (e.g., location, date and time, persons involved) was recorded to accompany all data collected. In addition, data screening and management followed the QA/QC procedures outlined below in Section 2.4. Duplicate samples for laboratory analysis were collected at two sites, and an equipment blank for laboratory analysis was collected at one site.

Table 5. Sediment quality parameters analyzed from samples collected from Mon-8/9 monitoring sites in October 2022.

Analyte Group	Parameter	Units	Method Detection Limits
Anions and Nutrients	Total Nitrogen	%	0.020
Organic / Inorganic Carbon	Inorganic Carbon (as $CaCO_3$)	%	0.40
	Organic / Inorganic Carbon		0.083 - 0.45
	Organic Matter		0.10 - 0.45
	Total Carbon		0.050
	Total Inorganic Carbon		0.050
	Total Organic Carbon		0.083 - 0.45
Particle Size	% Clay (<4 µm)	%	1.0
	% Gravel (>2 mm)		1.0
	% Sand (0.063 mm - 0.125 mm)		1.0
	% Sand (0.125 mm - 0.25 mm)		1.0
	% Sand (0.25 mm - 0.50 mm)		1.0
	% Sand (0.50 mm - 1.0 mm)		1.0
	% Sand (1.0 mm - 2.0 mm)		1.0
	% Silt (0.004 mm - 0.0312 mm)		1.0
	% Silt (0.0312 mm - 0.063 mm)		1.0
Physical Tests	pH (lab)	pH units	0.10
Plant Available Nutrients	Available Ammonium as N	mg/kg	1.0
	Available Nitrate as N		2.0 - 2.5
	Available Nitrate and Nitrite as N		1.0 - 2.5
	Available Nitrite as N		0.40 - 0.99
	Available Phosphate as P		2.0

Table 5. Continued.

Analyte Group	Parameter	Units	Method Detection Limits
Metals	Aluminum (Al)	mg/kg	50
	Antimony (Sb)		0.10
	Arsenic (As)		0.10
	Barium (Ba)		0.50
	Beryllium (Be)		0.10
	Bismuth (Bi)		0.20
	Boron (B)		5.0
	Cadmium (Cd)		0.020
	Calcium (Ca)		50
	Chromium (Cr)		0.50
	Cobalt (Co)		0.10
	Copper (Cu)		0.50
	Iron (Fe)		50
	Lead (Pb)		0.50
	Lithium (Li)		2.0
	Magnesium (Mg)		20
	Manganese (Mn)		1.0
	Mercury (Hg)		0.0500
	Molybdenum (Mo)		0.10
	Nickel (Ni)		0.50
	Phosphorus (P)		50
	Potassium (K)		100
	Selenium (Se)		0.20
	Silver (Ag)		0.10
	Sodium (Na)		50
	Strontium (Sr)		0.50
	Sulfur (S)		1,000
	Thallium (Tl)		0.050
	Tin (Sn)		2.0
	Titanium (Ti)		1.0
	Tungsten (W)		0.50
	Uranium (U)		0.050
	Vanadium (V)		0.20
	Zinc (Zn)		2.0
	Zirconium (Zr)		1.0

2.3. Data Analysis

Water quality data collected in 2022 were compiled and compared to short-term maximum BC Water Quality Guidelines for the Protection of Aquatic Life (BC WQG-AL) (BC ENV 2021a), where applicable (see Section 2.3.1.1 for more details). Depth profile measurements collected from Williston and Dinosaur reservoirs were tabulated and replicate measurements were averaged for each depth, where available. Note that the depth profile measurements focused only on the upper 5 m of Williston and Dinosaur reservoirs, as per the requirements of the RFQ (BC Hydro 2019). This limits the assessment of vertical stratification in these deep reservoirs. As such, only temporal trends in water temperature in the upper 5 m of the two reservoirs throughout 2022 are discussed in Section 3.2.1.

In addition, annual summary statistics (average, minimum, maximum, and standard deviation) were calculated for each sampling location (Upstream Reservoirs, Site C Reservoir Reach, and Downstream Reach; see Section 2.1). Within each sampling location, statistics were calculated separately for each site group (Upstream Reservoirs, Peace River, or Tributaries) and were based on all the data collected at sites within each location in 2022. Parameters with a concentration below the method detection limit (MDL) were assumed to have a concentration equal to the MDL for calculation of the summary statistics. The 2022 annual summary statistics tables also include the number of samples below the MDL and the number of samples exceeding the applicable short-term maximum BC WQG-AL (BC ENV 2021a).

Consistent with SEES JV (2020a), scatterplots were generated to illustrate water quality results for five parameters: total nitrogen, total phosphorus, total organic carbon (TOC), total iron, and chlorophyll-*a*. In consultation with BC Hydro, these parameters were selected for plotting by SEES JV (2020a) to characterize the trophic status in the Peace River and tributaries and water quality parameters that may influence fish health. The scatterplots present the water quality results for each month and site, within the site groups (Peace River Upstream, Peace River Downstream, Tributaries Upstream, Tributaries Downstream and Upstream Reservoirs; see Section 2.1) displayed as separate panels. Furthermore, summary statistics calculated for the pre-construction (2007, 2008, 2010, 2011, and 2015) and construction phases (2016 – 2019) for the five parameters were extracted from SEES JV (2020a) and the average and range of values observed within each site group were included on the scatterplot for comparison with the 2022 results.

Sediment quality data collected in 2022 were compiled and compared to the BC Working Sediment Quality Guidelines (BC WSQG) for Freshwater Aquatic Life (BC ENV 2021b), specifically the lower and upper WSQGs (see Section 2.3.1.2 for more details).

2.3.1. Regulatory Guidelines

BC ENV (2021a) states that:

> *"WQGs provide policy direction to those making decisions affecting water quality. Although WQGs do not have any direct legal standing, once approved, BC WQGs must be considered in any decision affecting water quality made within the ENV. WQGs are used to assess water quality and may be used as the basis for determining the allowable limits in waste discharge authorizations. Exceeding a WQG does not imply that unacceptable risk exists, but rather that the potential for adverse effects may be increased and additional investigation may be required."*

Sections 2.3.1.1 and 2.3.1.2 describe the application of the regulatory guidelines used in comparison with the data collected under Mon-8 and Mon-9.

2.3.1.1. BC Water Quality Guidelines for the Protection of Aquatic Life

Water quality data were screened against the applicable short-term maximum BC WQG-AL (BC ENV 2021a). Several water quality parameters have BC WQG-AL that are calculated based on an equation (denoted by "EQ" in the summary tables provide in Appendix A) that depends on the value of another parameter (e.g., pH, dissolved hardness (as $CaCO_3$), dissolved organic carbon (DOC), chloride). These guidelines are calculated based on the water chemistry associated with each sampling site/date. Where applicable, triplicate in situ pH and water temperature were averaged for the calculation of the guidelines. Any exceedances of the short-term maximum BC WQG-AL are highlighted in yellow in the data summary tables. The number of samples exceeding the guidelines within each site group are shown in the annual summary statistics tables and highlighted in grey if there were any exceedances.

2.3.1.2. BC Working Sediment Quality Guidelines

Sediment quality data were screened against the applicable BC WSQGs (BC ENV 2021b). Selenium concentrations measured in sediments were screened against an "Alert Concentration" established because there was insufficient scientific literature to support a full or interim guideline for aquatic life (BC ENV 2021a).

Definitions related to BC WSQGs are reproduced below (BC ENV 2021b).

> "*Most sediment quality variables have two WSQG:*
>
> - "*Lower WSQG—a concentration that will protect aquatic life from the adverse effects of a toxic substance in most situations (equivalent to Canadian Council of Ministers of the Environment's (CCME) Threshold Effect Level or Interim Sediment Quality Guideline (TEL or ISQGs))* (CCME 2001).

- *Upper WSQGs—a concentration that if exceeded will likely cause severe effects on aquatic life (equivalent to CCME's Probable Effect Level (PEL))* (CCME 2001).

  The two values provide three ranges of concentrations to support sediment decision making (CCME 2001)*:*

- *Concentrations < WSQG are rarely associated with adverse biological effects;*
- *Concentrations > Lower WSQG but < Upper WSQG are occasionally associated with adverse biological effects; and*
- *Concentrations > Upper WSQG are frequently associated with adverse biological effects."*

These guidelines are not based on cause-effect studies, but on levels of toxic substances found in the sediment where biological effects have been measured. Caution should be exercised in the application of these guidelines (BC ENV 2021b).

2.4. QA/QC

To ensure accurate and reliable results, all data collection and analyses undergo rigorous QA/QC. In situ measurements are recorded in triplicate for each parameter. In situ meters are maintained and calibrated as per manufacturer's guidelines; repair and calibration data are recorded and stored in a detailed log. QA/QC samples are included in water and sediment quality sampling for laboratory analysis as required based on sampling frequency. For water quality, QA/QC samples include replicates (duplicates/triplicates), travel blanks, and field blanks. Sediment quality QA/QC samples include duplicates and equipment blanks. Equipment blanks are obtained following the collection of each sample by washing the sediment sampling equipment (including the grab device or shovel and the Rubbermaid tote) with a mild dish soap, triple rinsing the equipment with deionized water, and collecting the rinse water from a fourth and final rinse. Laboratory analysis of samples collected from the reservoirs, tributaries, and main stem of the Peace River is completed by ALS. ALS is registered with the Canadian Association for Laboratory Accreditation (CALA) and conforms with requirements of ISO/IEC 17025:2017. Additionally, ALS is qualified under the British Columbia *Environmental Management Act* Environmental Data Quality Assurance (EDQA) Regulation to perform the suite of chemical analyses included for water quality monitoring. All samples are transported under standard chain of custody procedures and comprehensive QC checks are completed by the laboratory with every analysis.

Data are entered into EcoDAT, Ecofish's proprietary data management system, where comprehensive manual and automated QA/QC procedures are implemented. Detailed information (e.g., collection date, persons involved, and analytical methods, techniques, or procedures employed) is recorded for all analyses. Sample data and QA/QC results are evaluated based on the BC Guidelines for Interpreting Water Quality Data (RISC 1998) and BC Field Sampling Manual (Gov BC 2013).

The following overall QA/QC objectives were established for the program:

- % QA/QC samples (e.g., replicates, field blanks, travel blanks, and equipment blanks) collected should be at least 10% of the overall sampling program (Gov BC 2013).
- Field, travel, and equipment blanks should not exceed the MDL for any parameter, not including pH which is detectable in both samples and blanks.
- Precision between duplicates is expected to meet the Government of BC (Gov BC 2013) guideline, unless variability between replicates is a natural occurrence (e.g., during highly turbid flow, TSS, metals, and turbidity may be highly variable):
  - Relative percent difference (RPD) between duplicates should be <20%; and
  - This metric is only calculated if at least one of the replicates was >5× the MDL.
- Precision between triplicates is expected to meet the Resource Inventory Standards Committee (RISC 1998) guideline, unless variability between replicates is a natural occurrence (e.g., during highly turbid flow, TSS, metals, and turbidity may be highly variable):
  - Relative standard deviation (RSD) between triplicates should be <18%; and
  - This metric is only calculated if at least one of the replicates was >5× the MDL.
- The cation - anion balance (% difference) should be <10% for water quality samples that include the necessary major anions and cations for this calculation. The total anion sum and cation sum are expected to be within 10% of each other (ALS ND).
- Considering the water quality parameters having paired dissolved and total concentrations, the dissolved concentration should be <1.2× the total concentration. This metric was calculated if the dissolved concentration was >5× the MDL.

Additional QA/QC checks and procedures in 2022 included:

- Review of field data sheets, QA/QC of in situ data manually entered into EcoDAT;
- Review of electronically uploaded ALS laboratory data;
- Review of laboratory hold time exceedances and sample qualifiers, the hold time for pH is 15 minutes and therefore exceedance of this hold time is unavoidable for all field samples; and
- Review of in situ measurements and corresponding laboratory results for pH, turbidity, and specific conductivity. These data are evaluated to ensure that they are comparable. It is expected that these values will vary due to differences in analytical methods and precision between in situ meters and laboratory instruments. This comparison is therefore completed by a Qualified Professional, and is largely qualitative, ensuring that values measured in the field and in the laboratory are within reasonable agreement.

Laboratory hold time exceedances, sample qualifiers, field, travel, and equipment blank results, and precision between replicates are reviewed by a Qualified Professional for QA/QC issues that may affect interpretation of the data presented in this report. Another subject matter expert reviews all results and data interpretations. Customized automated data routines, including spreadsheet calculations and pivot tables, and coding in the statistical analysis software R, are utilized to reduce transcription or other data errors.

3. RESULTS

3.1. Overview

Tabulated water and sediment quality results for each site and sampling period (sampling event) are presented in Appendix A, where values are compared to BC WQG-AL and BC WSQGs, respectively. Water and sediment quality results are discussed below in Sections 0 and 3.3, respectively. Water quality results are discussed for the Upstream Reservoirs, the Site C Reservoir Reach, and the Downstream Reach. Within each reach, results are compared between Peace River and tributary sites. Representative site photos from each site are shown in Appendix B.

A summary of QA/QC results for water and sediment quality are provided in Appendix C and are discussed below in Section 3.2.4 (Water Quality) and Section 3.3.4 (Sediment Quality). Furthermore, ALS laboratory reports of water quality and sediment quality data are provided in Appendix D and Appendix E, respectively.

3.2. Water Quality Sampling

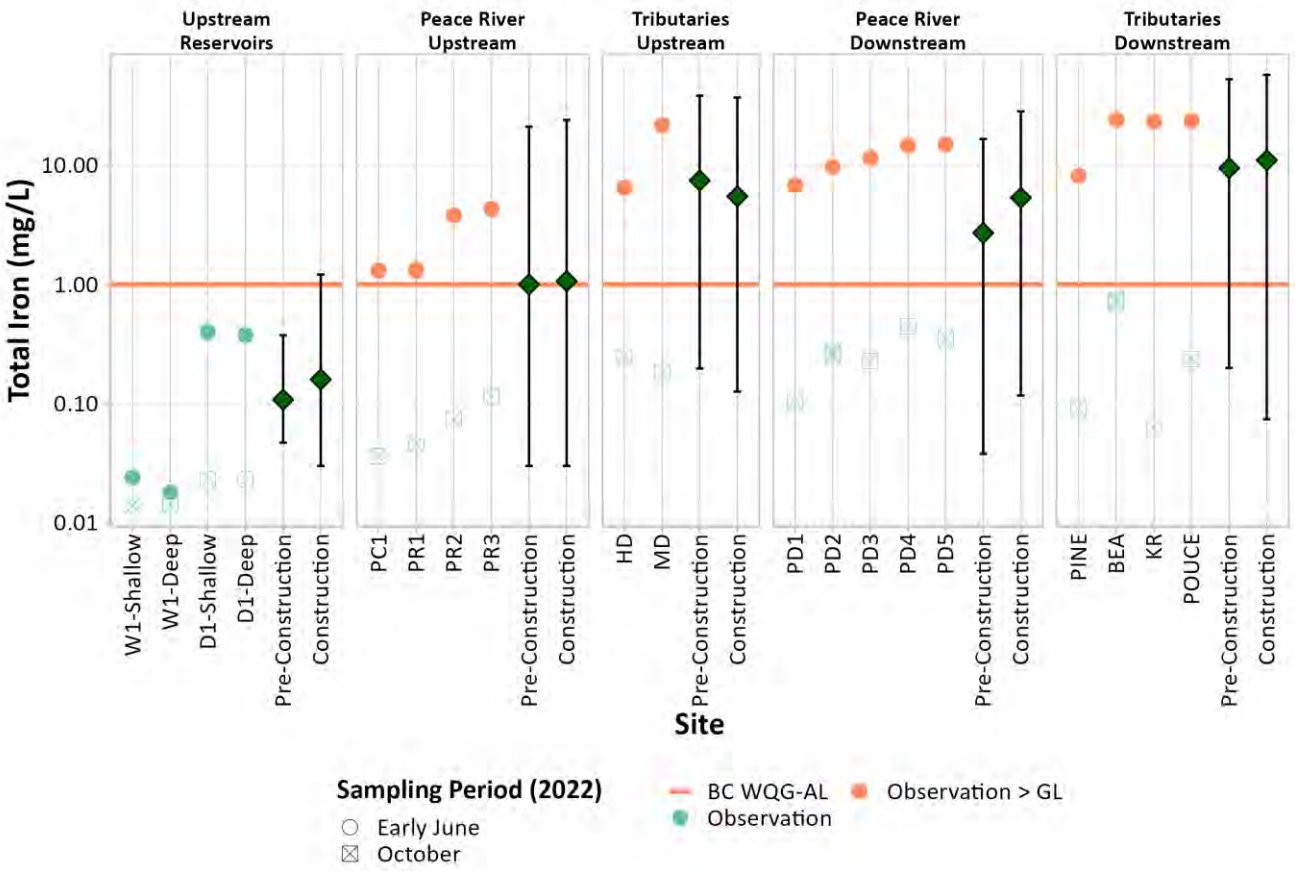
The parameters that were selected for plotting by SEES JV (2020a) in consultation with BC Hydro to characterize the trophic status in the Peace River and tributaries and water quality parameters that may influence fish health include total nitrogen, total phosphorus, TOC, total iron, and chlorophyll-*a*. Summary statistics (i.e., the mean ± standard deviation) for each of these parameters are provided by site type (Upstream Reservoirs, Peace River Upstream, Tributaries Upstream, Peace River Downstream, and Tributaries Downstream) and by monitoring period (Pre-Construction (2007-2015), Construction (2016–2019), and for 2022) in Table 6. Scatterplots showing all of the data collected in 2022 for these parameters, along with mean values and ranges for each of the Pre-Construction (2007-2015) and Construction (prior to 2022) periods are provided below in Figure 1 through Figure 5. Data shown in Table 6 and in Figure 1 through Figure 5 are discussed in Section 3.2.1 (Williston and Dinosaur reservoirs), Section 3.2.2 (Peace River Site C Reservoir Reach), and Section 3.2.3 (Peace River Downstream Reach).

Table 6. Summary statistics for select water quality parameters among site types during the pre-construction, construction, and 2022 periods.

Parameter	Site Type	Mean Concentration ± SD		
		Pre-Construction	Construction	2022
Total Nitrogen (mg/L)	Upstream Reservoirs	0.17 ± 0.10	0.15 ± 0.03	0.16 ± 0.04
	Peace River Upstream	0.23 ± 0.22	0.18 ± 0.11	0.19 ± 0.05
	Tributaries Upstream	0.64 ± 0.82	0.42 ± 0.59	0.36 ± 0.42
	Peace River Downstream	0.35 ± 0.29	0.26 ± 0.24	0.23 ± 0.09
	Tributaries Downstream	1.03 ± 1.03	0.73 ± 0.54	0.59 ± 0.35
Phosphorus (P) - Total (mg/L)	Upstream Reservoirs	0.01 ± 0.00	0.01 ± 0.01	0.01 ± 0.01
	Peace River Upstream	0.05 ± 0.12	1.01 ± 2.13	0.03 ± 0.04
	Tributaries Upstream	0.21 ± 0.23	0.21 ± 0.44	0.23 ± 0.40
	Peace River Downstream	0.12 ± 0.23	0.17 ± 0.31	0.11 ± 0.13
	Tributaries Downstream	0.22 ± 0.29	0.42 ± 1.39	0.17 ± 0.25
Total Organic Carbon (mg/L)	Upstream Reservoirs	-	3.0 ± 0.6	2.9 ± 0.5
	Peace River Upstream	3.4 ± 1.7	2.9 ± 3.9	3.4 ± 1.2
	Tributaries Upstream	10.1 ± 13.6	9.6 ± 9.4	6.2 ± 5.6
	Peace River Downstream	3.8 ± 1.6	6.7 ± 6.7	4.8 ± 3.1
	Tributaries Downstream	-	21.7 ± 17.2	17.9 ± 13.2
Iron (Fe) - Total (mg/L)	Upstream Reservoirs	0.1 ± 0.1	0.2 ± 0.3	0.1 ± 0.2
	Peace River Upstream	1.0 ± 3.3	1.1 ± 3.5	1.4 ± 1.5
	Tributaries Upstream	7.4 ± 12.1	5.5 ± 9.1	7.2 ± 10.1
	Peace River Downstream	2.7 ± 4.0	5.3 ± 8.0	5.4 ± 6.3
	Tributaries Downstream	9.5 ± 16.0	11.0 ± 15.9	9.0 ± 11.3
Chlorophyll-*a* (µg/L)	Upstream Reservoirs	-	0.96 ± 0.44	1.84 ± 1.15
	Peace River Upstream	0.78 ± 0.28	1.00 ± 0.52	-
	Tributaries Upstream	0.37 ± 0.24	3.16 ± 1.07	-
	Peace River Downstream	0.87 ± 0.28	1.51 ± 0.34	-
	Tributaries Downstream	-	4.31 ± 2.15	-

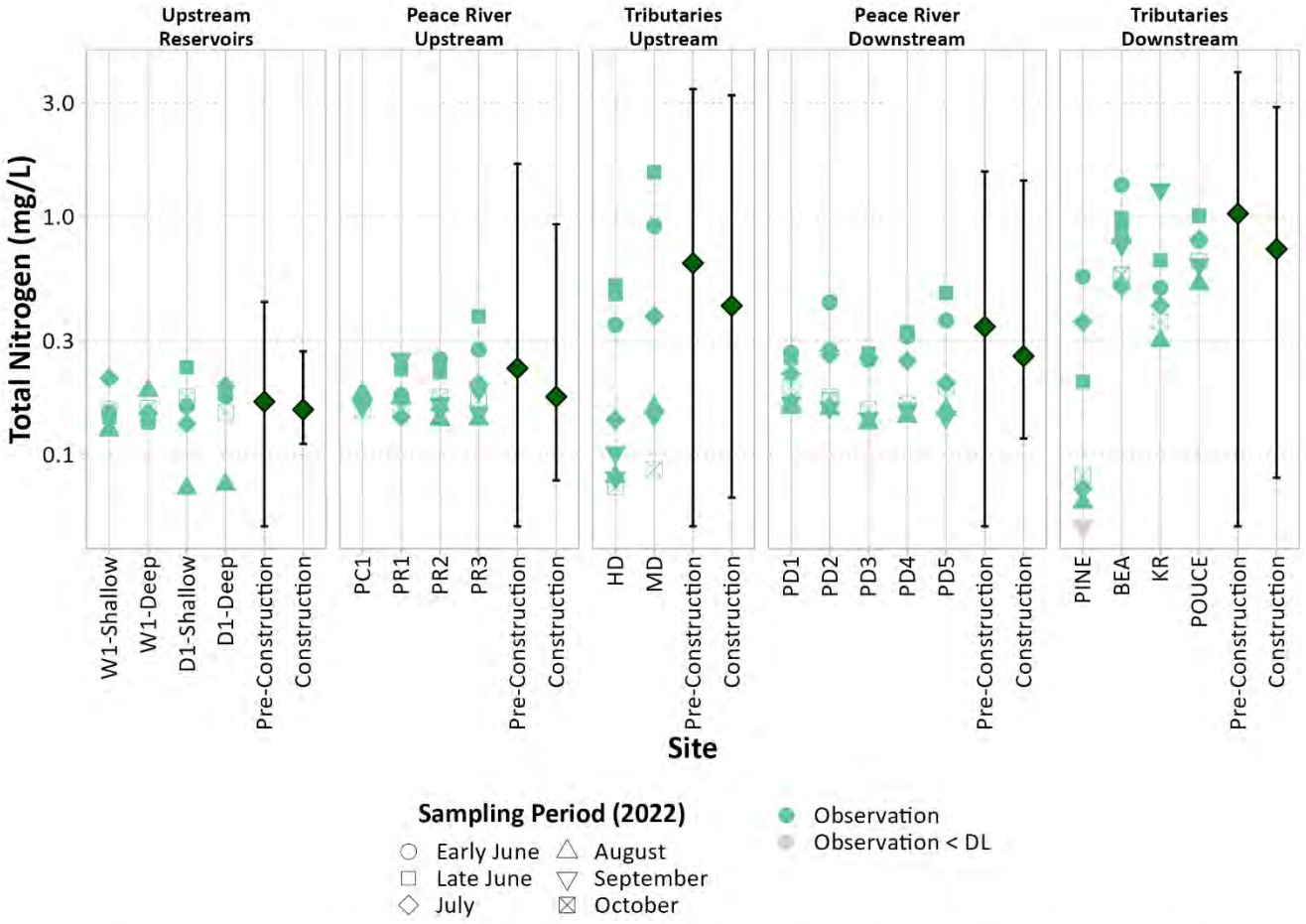
The average ± standard deviation are shown for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) phases, and for 2022. Summary statistics for the pre-construction and construction phases were extracted from SEES JV (2020a), and represent data collected once a month between May and October (with the exception of iron, which is only measured in May and October of each year). All values are shown in mg/L except where indicated otherwise. "-" indicates that the parameter was not collected at the given site type during the sampling period.

Figure 1. **Total iron (mg/L) in water quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) during pre-construction, construction, and 2022 sampling periods. GL = guideline.**



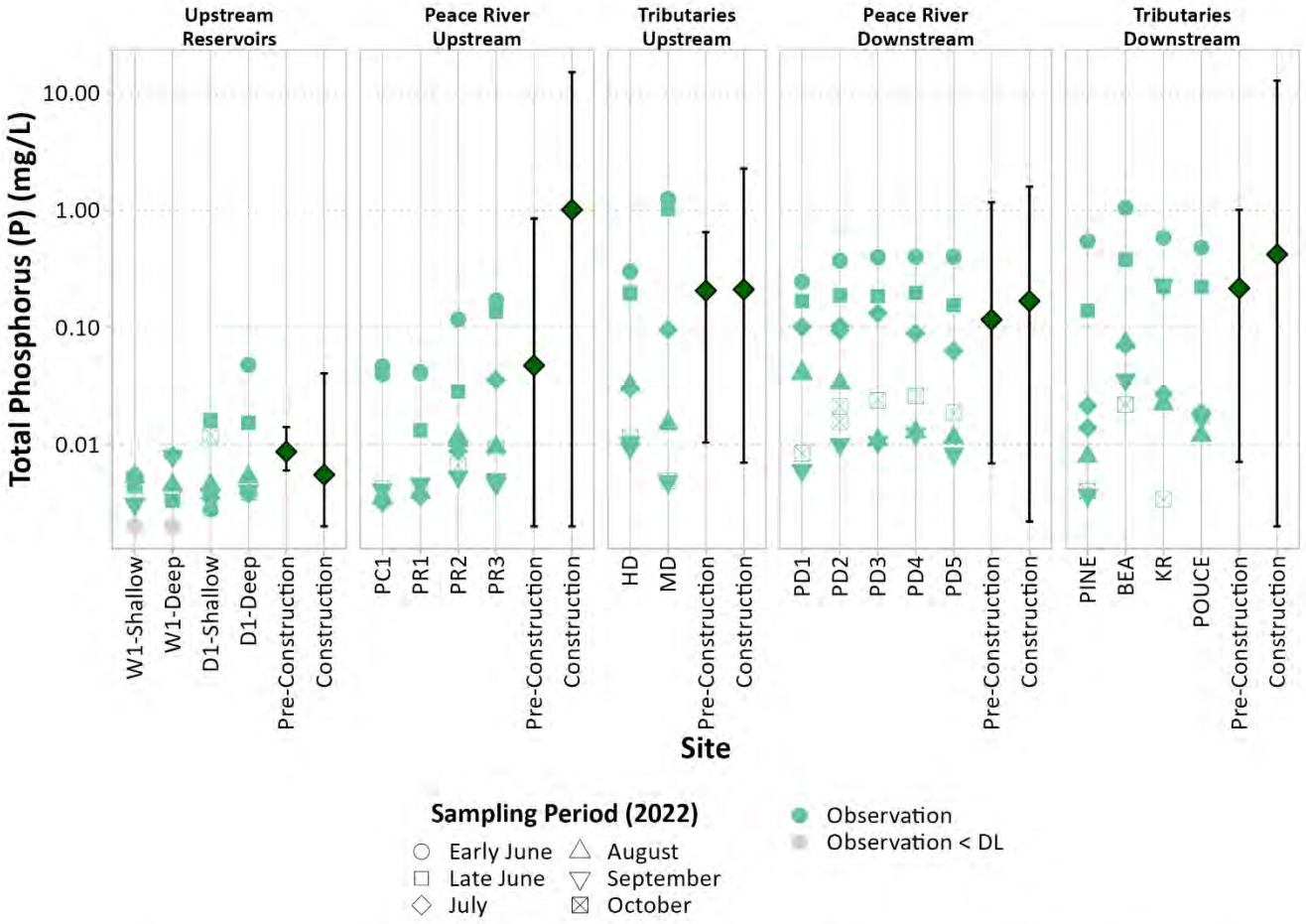
BC WQG-AL is the short-term maximum British Columbia Water Quality Guideline for the protection of aquatic life (BC ENV 2021a). The average concentrations for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) periods for each group is shown as a dark green diamond. The error bars in black represent the range of values observed. Summary statistics were extracted from SEES JV (2020).

Figure 2. **Total nitrogen (mg/L) in water quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) during pre-construction, construction, and 2022 sampling periods. DL = detection limit.**



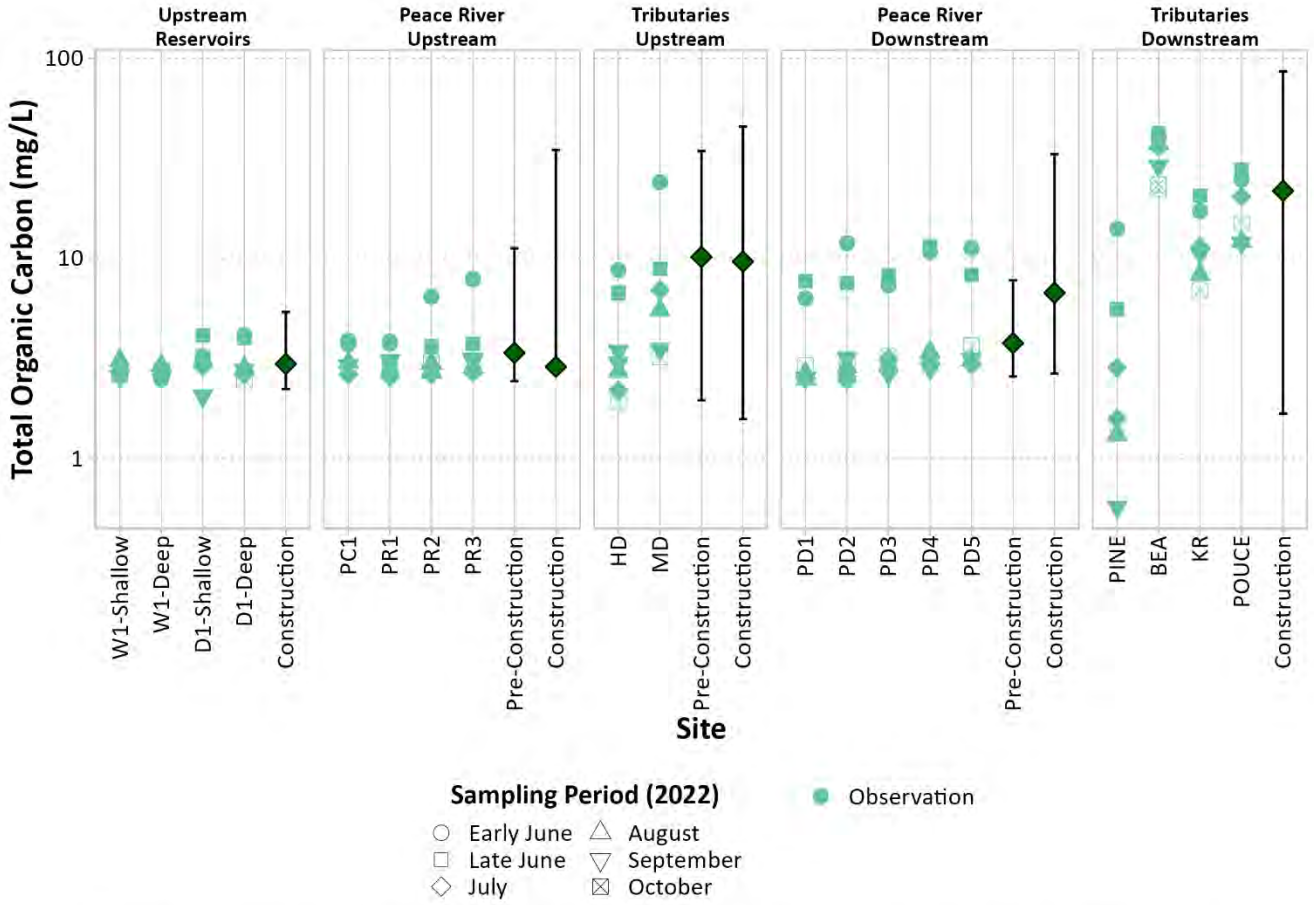
The average concentrations for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) periods for each group is shown as a dark green diamond. The error bars in black represent the range of values observed. Summary statistics were extracted from SEES JV (2020).

Figure 3. **Total phosphorus (mg/L) in water quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) during pre-construction, construction, and 2022 sampling periods. DL = detection limit.**



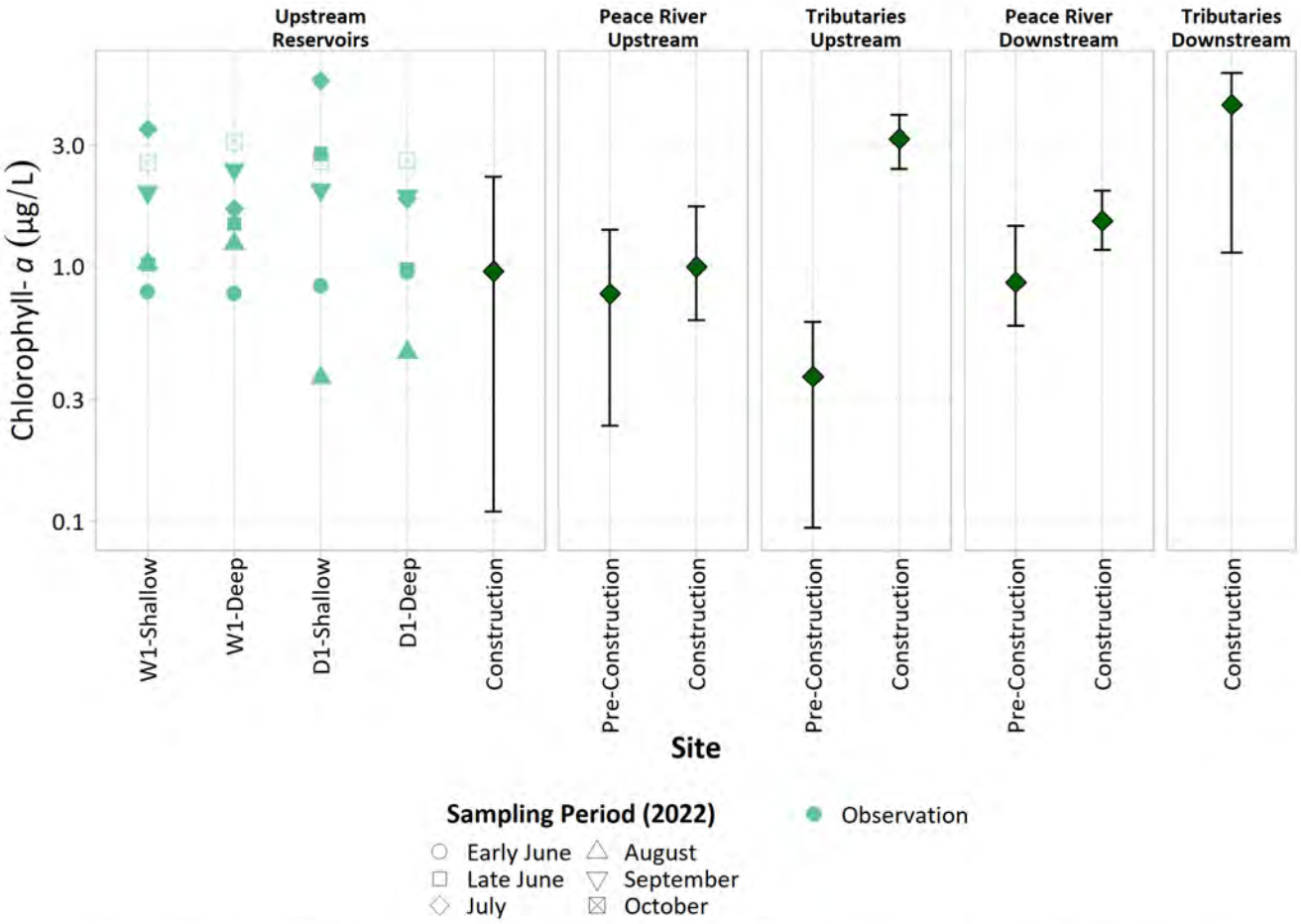
The average concentrations for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) periods for each group is shown as a dark green diamond. The error bars in black represent the range of values observed. Summary statistics were extracted from SEES JV (2020).

Figure 4. **Total organic carbon (mg/L) in water quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) during pre-construction, construction, and 2022 sampling periods.**



The average concentrations for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) periods for each group is shown as a dark green diamond. The error bars in black represent the range of values observed. Summary statistics were extracted from SEES JV (2020).
The minimum value observed during the Construction period at Peace River Upstream sites (0.0025 mg/L) is not shown due to scale.

Figure 5. **Chlorophyll-*a* (µg/L) in water quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) during pre-construction, construction, and 2022 sampling periods.**



The average concentrations for the pre-construction (2007, 2008, 2010, 2011 and 2015) and construction (2016 - 2019) periods for each group is shown as a dark green diamond. The error bars in black represent the range of values observed. Summary statistics were extracted from SEES JV (2020).

3.2.1. Williston and Dinosaur Reservoirs

During Mon-8 water quality monitoring within the Upstream Reservoir Reach in Williston and Dinosaur reservoirs in 2022, all parameters were within appliable BC WQG-AL (Tables 3 – 12 and 33 – 35 of Appendix A). Results are discussed in further detail below.

In situ measurements focused on the upper 5 m of Williston and Dinosaur reservoirs as per the requirements of the RFQ (BC Hydro 2019). As such, vertical stratification patterns were not studied. Temporal trends in water temperature in the upper 5 m of the two reservoirs throughout 2022 are discussed here. At both reservoir sites, water temperatures generally increased then decreased with seasonal changes from early June to October (Figure 1 and Tables 1 and 2 of Appendix A). At W1, the lowest temperatures were observed in early June 2022 and the highest temperatures in August 2022 (Figure 1 and Table 1 of Appendix A). Within the upper 5 m of the reservoir in September and October, there was little to no variation in temperature with increasing depth.

At D1, the lowest temperatures were observed in early June 2022 and the highest in July 2022 (Figure 1 and Table 2 of Appendix A). Water temperature in August 2022 was colder than that in July, September and October 2022 (Figure 1 and Table 2 of Appendix A). Within the upper 5 m of the reservoir in September and October, there was little to no variation in temperature with increasing depth.

In situ measurements of DO, redox potential, TDS, electrical conductivity, and specific conductivity collected throughout the water column at W1 and D1 remained relatively stable for all sampling periods (early June to October 2022) (Tables 1 and 2 of Appendix A). The water column remained well-oxygenated between June and October with DO levels remaining above the minimum BC WQG-AL of 9 mg/L. pH values at W1 ranged from 7.59 in early June 2022 to 8.58 in October 2022. pH values at D1 ranged from 7.72 in October 2022 to 8.28 in July 2022. pH values at both sites were within the BC WQG-AL 6.5 – 9 range, outside of which below changes due to human activities are restricted (BC ENV 2021a).

Colour, TSS, TDS, and turbidity were low at the two reservoir sites in 2022 (Tables 3 and 6 – 10 of Appendix A). Concentrations of TSS were below the MDL in most samples except from samples collected in June at D1 (both shallow and deep) and in July in the deep sample at W1. Concentrations of TSS at D1 were higher in early June (18.0 mg/L at D1-Deep and 11.0 mg/L at D1-Shallow) than later in June (5.20 mg/L at D1-Deep and 3.20 mg/L at D1-Shallow). Secchi depths ranged from 1.95 m in July to 5.00 m in early June at W1 and from 0.40 m in early June to 5.17 m in August at D1 (Tables 1 and 2 of Appendix A). Secchi depths were consistent with TSS measurements with lower Secchi readings during sampling periods when TSS concentrations were detectable, and turbidity was highest (July at W1 and early and late June at D1).

Total and dissolved metals analysis was conducted in early June and October 2022. There were no exceedances of the BC WQG-AL at the upstream reservoir sites in 2022 (Tables 4, 5, 11, and 12 of Appendix A). Dissolved hardness concentrations ranged from 84.2 mg/L to 96.0 mg/L within the two reservoirs in early June and October 2022 (Tables 3 and 6 – 10 of Appendix A), indicating water

in the reservoirs is moderately soft (BC MOE 2013). Water quality guidelines for cadmium, fluoride, lead, manganese, and zinc are hardness-dependent and would be relatively low in moderately soft waters (BC ENV 2021a). Despite these relatively low hardness-dependent guidelines, these parameters remained below the BC WQG-AL in all samples collected from the upstream reservoirs.

Concentrations of the five parameters selected for plotting in 2022 (total iron, total nitrogen, total phosphorus, TOC, and chlorophyll-*a*; Section 2.3) were generally comparable to previous concentrations from the pre-construction (2007, 2008, 2010, 2011, and 2015) and construction (2016 – 2019) periods (Table 6, Figure 1 – Figure 5). Note that the pre-construction and construction data in this table and these figures are from May through October (May and October only for total iron, SEES JV 2020a). Concerns had been raised in previous sampling years regarding potential contamination of organic carbon samples (SEES JV 2020a); however, there were no QA/QC concerns related to TOC measurements at the two reservoir sites in 2022.

The highest concentrations of total iron measured in the reservoirs were observed in early June with concentrations at W1 (0.024 mg/L at W1-Shallow and 0.018 mg/L at W1-Deep) being markedly lower than at D1 (0.399 mg/L at D1–Shallow and 0.376 mg/L at D1-Deep). This is consistent with previous observations (SEES JV 2020a), and with typical seasonal patterns in the Peace River whereby metal concentrations are highest at times where sediment loads are elevated due to spring freshet. Furthermore, total iron concentrations in 2022 were similar to previous measurements during the pre-construction and construction phases (Table 6 and Figure 1).

Concentrations of total nitrogen, total phosphorus, and TOC were generally consistent from early June to October 2022 at W1 (Figure 2, Figure 3, and Figure 4). At D1, concentrations of total iron, total phosphorus, and TOC were markedly higher in samples collected in early and late June than in other sampling periods (consistent with the highest turbidity/TSS measurements) (Figure 1, Figure 3, and Figure 4).

In 2022, chlorophyll-*a* concentrations at both depths were at their lowest in early June at W1 and in August at D1 (Figure 5; Tables 3 and 6 – 10 of Appendix A). In shallow samples (W1-Shallow and D1-Shallow), chlorophyll-*a* concentrations peaked in July (3.46 µg/L at W1 and 5.37 µg/L at D1). In deep samples (W1-Deep and D1-Deep), chlorophyll-*a* concentrations generally increased from early June to July, declined in August and increased until October when the highest concentrations for the year were observed (3.08 µg/L at W1 and 2.60 µg/L at D1). In previous years of the construction phase (2016 – 2019), median concentrations of chlorophyll-*a* were highest in September and October with increases from August through to October (SEES JV 2020a). In 2022, chlorophyll-*a* concentrations also increased from August to October; however, the median concentrations considering all reservoir samples was highest in July.

3.2.2. Peace River Site C Reservoir Reach

During Mon-8 water quality monitoring within the Site C Reservoir Reach in 2022, most parameters were within appliable BC WQG-AL (Tables 13 – 22 and 36 – 38 of Appendix A). Exceedances were

only observed for total iron, total zinc, and DO. Parameters with exceedances of the BC WQG-AL as well as related parameters (TSS and dissolved hardness) are discussed in further detail below.

Seasonal water quality in the Peace River its tributaries has been well documented in baseline studies for the Project (Golder 2012), and previous water quality monitoring reports (e.g., SEES JV 2017, 2018, 2019, 2020a and Ganshorn *et al.* 2022, 2023). Typically, changes in water quality follow seasonal patterns in the suspended sediment load of the Peace River. The suspended sediment load of the Peace River is low during winter months and is typically low in the fall months; tributaries deliver large inputs of suspended sediment to the Peace River during spring freshet and rain events in the spring, summer, and early fall months.

Water quality results in 2022 followed typical seasonal clear/turbid flow patterns in the Peace River and its tributaries (Tables 13 and 16 – 20 of Appendix A). Generally, the tributaries and sites downstream of the tributaries were more turbid than sites upstream of the tributaries. The Moberly River was the most turbid (TSS ranging from <3.0 mg/L from August to October to 1,200 mg/L in early June) and PC1 the least turbid (TSS ranging from <3.0 mg/L from July to October to 24.3 mg/L in early June). Overall, TSS concentrations were highest in June with turbid flows at all sites except PR1 and PR2 in early June, and at PR3, HD, and MD in late June (Tables 13 and 16 – 20 of Appendix A). Clear flows (TSS <25 mg/L) were observed at all sites in August, September, and October 2022, and at all sites in July, except for MD (TSS of 60.2 mg/L).

In general, in situ measurements indicate that sites within the Site C Reservoir Reach are well-oxygenated with DO concentrations ranging between 8.12 mg/L at MD in August to 12.51 mg/L at PR1 in early June. However, DO concentrations were below the 9 mg/L BC WQG-AL minimum guideline for the concentration in the water column that is applicable to buried embryo and alevin life stages in July and August at MD (8.47 mg/L and 8.12 mg/L, respectively), and at HD (8.81 mg/L and 8.75 mg/L, respectively). The BC WQG-AL for DO are largely based on the United States Environmental Protection Agency (US EPA) information on fishery production impairment levels modified to be sufficiently conservative for protecting cold water fisheries in BC (BC MOE 1997). The BC WQG-AL of 9 mg/L assumes that DO concentration in the pore water is approximately 3 mg/L lower than water column concentrations. The literature reviewed by BC MOE (1997) shows that lethal DO concentrations are ~1.5–3.0 mg/L for free swimming juvenile salmonids, as well as buried embryos/alevins for which the lethal range applies to interstitial waters, implying a lethal range of ~4.5–6.0 mg/L in overlying surface water. Concentrations of DO at HD and MD in July and August were only slightly below the guideline and as such acute toxic effects are unlikely.

Within the Peace River, dissolved hardness ranged from 81.2 mg/L at PC1 in October to 135 mg/L at PR3 in early June (Tables 13 and 16 – 20 of Appendix A), indicating that the water is moderately soft (BC MOE 2013). Within the tributaries (Halfway and Moberly rivers), dissolved hardness was generally higher than in the Peace River and ranged from 110 mg/L at MD in early June to 254 mg/L at MD in October with most samples being classified as very hard water. Dissolved hardness at PR3 was generally higher than dissolved hardness at sites upstream of the confluence with the

Halfway River. This spatial pattern was more pronounced in early June and late June and is likely due to increased inputs from the Halfway River (and other smaller tributaries) during freshet.

Total zinc only exceeded the BC WQG-AL at MD in early June 2022 with a concentration of 0.111 mg/L; the guideline value was 0.0488 mg/L and was calculated based on a dissolved hardness of 111 mg/L (Table 15 of Appendix A). This exceedance coincided with the highest TSS concentration observed at MD and represented the highest total zinc concentration observed within the Site C Reservoir Reach. Dissolved zinc concentrations were below the MDL at all sites within the Site C Reservoir Reach from early June to October 2022 (Tables 14 and 21 of Appendix A).

The total iron BC WQG-AL short-term maximum of 1 mg/L was exceeded at all Site C Reservoir Reach sites in early June, with the highest concentrations occurring in the tributaries at HD (6.47 mg/L) and MD (21.7 mg/L), coinciding with highly turbid flow (TSS of 289 mg/L and 1,200 mg/L, respectively) (Figure 1; Tables 13 and 15 of Appendix A). Total iron concentrations were low in October 2022 during clear flow periods. This is consistent with previous observations at sites sampled within the Site C Reservoir Reach (SEES JV 2020a), and the typical seasonal patterns in the Peace River whereby metal concentrations are highest at times where sediment loads are elevated due to spring freshet. Furthermore, total iron concentrations in 2022 were similar to previous measurements during the pre-construction and construction phases (Table 6 and Figure 1). Naturally occurring exceedances of the BC WQG-AL for total iron have been well established in previous baseline (Golder 2012) and water quality monitoring reports (e.g., SEES JV 2017, 2018, 2019, 2020a and Ganshorn *et al.* 2022, 2023). Natural exceedances occur predominantly during the freshet period (April to the end of June) and are most often associated with elevated concentrations of suspended sediment in the Peace River and tributaries.

On average, total nitrogen in 2022 (0.36 ± 0.42 mg/L for the tributaries and 0.19 ± 0.05 mg/L for the Peace River sites) and TOC (6.2 ± 5.6 mg/L for the tributaries and 3.4 ± 1.2 mg/L for the Peace River sites) were comparable to the range of values observed during the pre-construction and construction phases (Table 6, Figure 2, and Figure 4). Total phosphorus, total nitrogen, and TOC were generally consistent throughout the sampling periods in 2022 at the Peace River sites and at HD. However, a peak in concentration was observed for all three parameters in early June and late June at the tributary sites, HD and MD, and for TOC in early June at PR2 and PR3 (Figure 1, Figure 2, and Figure 3); this peak was most pronounced at MD.

The average total phosphorus concentration (0.23 ± 0.40 mg/L) for upstream tributary sites in 2022 was comparable to the pre-construction (0.206 ± 0.226 mg/L) and construction (0.211 ± 0.436 mg/L) phases (Table 6). In contrast, total phosphorus concentrations (average of 0.03 ± 0.04 mg/L) in the Peace River within the Site C Reservoir Reach were lower in 2022 than during the construction phase (average of 1.01 ± 2.13 mg/L), but comparable to the pre-construction phase (average of 0.05 ± 0.13 mg/L). The high average for the construction phase appears to be driven by elevated total phosphorus concentrations (maximum of ~15 mg/L) observed between 2016 and 2019 (SEES JV 2020a and Figure 3).

3.2.3. Peace River Downstream Reach

During 2022 Mon-9 water quality monitoring within the Downstream Reach, most parameters were within appliable BC WQG-AL (Tables 23 – 32 and 39 – 41 of Appendix A). Exceedances were only observed for dissolved and total iron, total zinc, total silver, and DO. Parameters with exceedances of the BC WQG-AL as well as related parameters (TSS and dissolved hardness) are discussed in further detail below.

Water quality results in 2022 followed typical seasonal clear/turbid flow patterns in the Peace River and tributaries (Tables 23 – 32 of Appendix A). Generally, the tributaries and sites downstream of the tributaries were more turbid than sites upstream of the tributaries. On average, the Beatton River (BEA) was the most turbid (TSS ranging from <3.0 mg/L in September and October to 1,080 mg/L in early June) and PD1 the least turbid (TSS ranging from <3.0 mg/L in October to 240 mg/L in early June). Overall, TSS concentrations were highest in early and late June with turbid conditions observed at all sites (Table 23 and 26 of Appendix A). Clear flows (TSS <25 mg/L) were observed at all sites within the tributaries in July 2022, while all Peace River sites showed turbid flows (Table 27 of Appendix A). Furthermore, clear flows were observed at all sites in August (except PD1, PD2, KR), and at all sites in September and October 2022.

In general, in situ measurements indicate that Peace River sites within the Downstream Reach are well-oxygenated with DO concentrations ranging from 9.62 mg/L at PD5 in July to 10.78 mg/L at PD1 in early June. Concentrations of DO in the tributaries were lower than the Peace River, ranging from 7.88 mg/L at POUCE in August to 12.34 mg/L at KR in October. Concentrations of DO were below the 9 mg/L BC WQG-AL minimum applicable to buried embryo and alevin life stages in at least one tributary site from early June to August 2022 (Tables 23 and 26 – 30 of Appendix A). As described in Section 3.2.2, lethal effects are expected at DO concentrations below 6.0 mg/L. The lowest DO concentrations observed (7.88 mg/L at POUCE) were above potentially lethal DO concentrations and as such acute toxic effects are unlikely.

Within the Peace River, dissolved hardness ranged from 86.2 mg/L at PD2 in October to 122 mg/L at PD1 in late June (Tables 23 and 26 – 30 of Appendix A) indicating that the water is moderately soft (BC MOE 2013). Within the tributaries, dissolved hardness was generally higher than in the Peace River and ranged from 51.6 mg/L at BEA in late June to 536 mg/L at POUCE in October with water hardness ranging from soft to very hard. Dissolved hardness within the tributaries, especially at POUCE, was generally higher than dissolved hardness within the Peace River.

Total zinc only exceeded the BC WQG-AL at PD3, PD4, PD5, KR, BEA, and POUCE in early June with concentrations ranging between 0.0604 mg/L (guideline value of 0.037 mg/L) at PD3 to 0.117 mg/L at BEA (guideline value of 0.033 mg/L) (Table 25 of Appendix A). Exceedances coincided with the highest TSS concentrations observed at those sites and represented the highest total zinc concentrations observed within the Downstream Reach. Total zinc was detected in early June at PD1 (0.0352 mg/L), PD2 (0.0467 mg/L), and PINE (0.0414 mg/L) but did not exceed the

BC WQG-AL. Dissolved zinc concentrations were below the MDL at all sites within the Downstream Reach in early June and October 2022 (Tables 24 and 31 of Appendix A).

The total iron BC WQG-AL short-term maximum of 1 mg/L was exceeded at all Downstream Reach sites in early June 2022 with the highest concentration occurring at BEA (24.1 mg/L), coinciding with highly turbid flow (TSS of 1,080 mg/L) (Figure 1; Table 25 of Appendix A). Total iron concentrations were lower in October 2022 during clear flow periods. This is consistent with previous observations for sites within the Downstream Reach (SEES JV 2020a), and the typical seasonal patterns in the Peace River whereby metal concentrations are highest at times where sediment loads are elevated due to spring freshet. Total iron concentrations in 2022 were similar to previous measurements during the pre-construction and construction phases (Table 6 and Figure 1).

In early June 2022, dissolved iron ranged from 0.038 mg/L at PD1 to 0.449 mg/L at BEA, where it exceeded the BC WQG-AL of 0.35 mg/L (Table 24 of Appendix A). In October 2022, dissolved iron concentrations were low and below the MDL at all sites except BEA (0.046 mg/L – 0.066 mg/L) (Table 31 of Appendix A). The highest concentration of dissolved iron and single exceedance of the BC WQG-AL coincided with the highest turbidity in the tributaries.

On average, total nitrogen (0.59 ± 0.35 mg/L for the downstream tributaries and 0.23 ± 0.09 mg/L for the Peace River downstream sites), total phosphorus (0.17 ± 0.25 mg/L for the downstream tributaries and 0.11 ± 0.13 mg/L for the Peace River downstream sites), and TOC (17.9 ± 13.2 mg/L for the downstream tributaries and 4.8 ± 3.1 mg/L for the Peace River downstream sites) were comparable to the range of values observed during the pre-construction and construction phases (Table 6, Figure 2, Figure 3, and Figure 4). Total nitrogen and TOC were generally consistent throughout the sampling periods in 2022 at the downstream Peace River sites and within the tributaries (Figure 2 and Figure 4). The only exceptions were elevated total nitrogen concentrations at BEA in early June and at KR in September.

3.2.4. QA/QC

QA/QC objectives for water quality analysis in 2022 were not consistently met but the deviations were minor. All QA/QC issues were reviewed and are discussed below. A summary of QA/QC results for water quality analysis is provided in Table 7, with detailed results provided in Appendix C.

Table 7. Summary of 2022 QA/QC water quality analysis objectives and outcomes.

QA/QC Procedure	Objective	Observation
Data Collection	Monitoring data are successfully recorded and collected.	Objective was not consistently met. See Figures 1–5 of Appendix C.
Sample Integrity	Recommended lab sample holding times are not exceeded (except for pH).	Objective was not consistently met. See Table 1 of Appendix C.
	In situ and laboratory results are comparable.	Objective was met.
Field and Travel Blanks	Blanks should not exceed the detection limit for any parameter.	Objective was not met for 3.4 % of the field blank data and for 0.4% of the travel blank data. See Tables 2-6 of Appendix C.
Field Replicates	Duplicate Relative Percent Difference (RPD) should be <20%[2].	Objective was not met on 2.9% of occasions. See Table 7 of Appendix C.
	Triplicate Relative Standard Deviation (RSD) should be <18%[2].	Objective was not met on 0.88% of occasions. See Table 8 of Appendix C.
Ion Balance	The total anion sum and cation sum are expected to be within ±10% of each other (ALS ND).	Objective was not met on one occasion.
D > T	Dissolved concentrations should be <1.2x the total concentrations[1].	Objective was not met in 0.4% of dissolved/total metal parameter pairs. See Table 9 of Appendix C.

[1] The D>T metrics are only calculated for dissolved (D) and total (T) pairs if the dissolved (D) analytical result is >5x the method detection limit (MDL).

[2] These metrics are only calculated if at least one of the replicates is >5x MDL; RPD criterion is as per Gov BC (2013) and RSD criterion is as per RISC (1998).

3.2.4.1. Review of Outliers

The nitrate concentration at KR in September 2022 was higher than those observed from any other month or site (Table 29 of Appendix A). However, this value was not flagged as anomalous as there were no QA/QC failures related to this parameter and the observed nitrate concentration was within the range of historical measurements within Peace River tributaries (e.g., Ganshorn *et al.* 2022). Outliers that are excluded are discussed below.

3.2.4.2. Omissions

Water quality parameters that were requested for analysis in the RFQ (BC Hydro 2019) but were not collected in situ or analyzed at the laboratory in 2022 are summarized below and in Figures 1 – 5 of Appendix C.

In early June, dissolved ferrous iron was not analyzed at any site, and dissolved hardness was not analyzed in the travel blank. Additionally, duplicate (rather than triplicate) measurements of redox potential and DO were collected at POUCE and PR3, respectively, and an elevated turbidity replicate from PD4 was flagged as an outlier and excluded from the dataset. In late June, PC1 was not sampled due to site access limitations caused by low river flows; colour was only analyzed at the reservoir sites (W1-Shallow, W1-Deep, D1-Shallow, D1-Deep) and in the travel blank. In July, orthophosphate and colour were not analyzed at MD. In August, dissolved hardness was not analyzed in the travel blank. In September, total nitrogen was not analyzed at the reservoir sites (W1-Shallow, W1-Deep, D1-Shallow, D1-Deep) nor in the travel blank. In October, dissolved hardness was not analyzed in the travel blank. Additionally, Secchi depth was not recorded at either reservoir site in September or October due to inclement weather conditions.

3.2.4.3. Field Sampling Issues

Field crews encountered various challenges while sampling during 2022, including adverse field conditions (e.g., wind, swift currents, wildfire smoke) and equipment limitations. Site conditions (e.g., swift currents, wind) frequently prevented the YSI meter from being submerged to the desired depth to collect in situ measurements. In September, the deep samples collected from the reservoir sites were collected from a depth of 3.5 m rather than 5.0 m due to the limited length of the sampling tube. The sampling site locations were kept as consistent as possible each month; however, unavoidable factors (i.e., inadequate water levels, and site access challenges) periodically resulted in field crews having to conduct sampling at alternate sites (typically within ~200 m). Due to site access issues in early June, field crews had to collect water quality samples for POUCE near the confluence of the Pouce Coupe River and the Peace River, and they noted that the samples may be influenced by water from the Peace River. In August, BEA and HD sampling was conducted ~1 km upstream of their original site locations.

3.2.4.4. QA/QC Objectives

Results of the water quality QA/QC checks and procedures completed in 2022 are provided in summary tables in Appendix C. The number of QA/QC laboratory samples (12 replicates, six field blanks, and eight travel blanks) comprised 18.7% (26 of 139 samples) of the overall sampling program based on the total number of water quality samples collected in 2022. The number of QA/QC in situ measurements is 66% (2/3) based on the triplicate measurement for each parameter. Overall, sampling in 2022 has surpassed the QA/QC objective of at least 10% QA/QC effort.

On occasion, hold times were exceeded for sample analysis for total ammonia (one sample date), chlorophyll-*a* (three sample dates), colour (six sample dates), dissolved ferrous iron (six sample dates), nitrate (six sample dates), nitrite (seven sample dates), orthophosphate (eight sample dates), total phosphorus (one sample date), TDS (one sample date), total Kjeldahl nitrogen (one sample date), total nitrogen (one sample date), TOC (one sample date), and TSS (one sample date) in 2022 due to field sampling logistics, shipping delays, and delayed sample analysis because the variable was omitted from the initial laboratory analysis. Where hold times were exceeded, results were reviewed to ensure

parameter values were consistent with previous sampling results, and no data were flagged in 2022 due to hold time exceedances. The number of samples affected by potential hold time exceedances which occurred in 2022 are summarized in Table 1 of Appendix C, with the exception of pH which has a hold time of only 15 minutes (laboratory analysis within this time frame is not practical).

The 2022 field blank and travel blank results were non-detectable (below the MDL) for 96.6% of the field blank data (312/323) and 99.6% of the travel blank data (228/229) (Tables 2 – 6 of Appendix C). The travel blank detection of total ammonia and the field blank detections of DOC, TOC, total ammonia, and select dissolved metals were all <5× the MDL. Additionally, the field blank detections of alkalinity (bicarbonate) and total alkalinity were at the MDL. As such, no substantial effect on data quality is expected.

Elevated variability between duplicate laboratory samples (RPD >20%) was observed on several occasions for the following water quality parameters: TSS, total phosphorus, total nitrogen, total Kjeldahl nitrogen, TOC, DOC, total ammonia, total methylmercury, and select total and dissolved metals, during turbid and clear flow conditions (Table 7 of Appendix C). Variability exceeding the QA/QC objective threshold occurred on 19 of 662 occasions (2.9%). Results are within historical ranges and are thought to reflect natural heterogeneity in the Peace River and its tributaries. No substantial effect on data quality is expected.

Variability among triplicate in situ measurements exceeded the QA/QC objective of RSD <18% on 11 of 1,253 occasions (0.88%). Turbidity was the only parameter to exceed this objective (Table 8 of Appendix C). The elevated triplicate RSD for turbidity at PD4 on June 4, 2022, was due to an outlier that was removed from all subsequent analyses. No substantial effect on data quality is expected from the remaining ten occasions for the following reasons: the turbidity triplicate RSD was only slightly greater than 18% at PD3 on June 29 and September 19 and at PD5 on October 20; the replicates at PD3 on July 27 were all within historical ranges; and, turbidity measurements were low (triplicate mean <8 NTU) at PC1 (on July 26), PR1 (on July 26), PR2 (on September 21 and October 21), PINE (on September 27), and at PD1 (on October 22).

The cation - anion balance was 12.6% in the sample collected from D1-Shallow in late June; the cation - anion balance was less than ± 10% in all other samples where this metric was calculated. This single exceedance is not expected to have a substantial impact on data quality as it is only slightly above the ± 10% objective and may be attributable to the presence of less common species or organic salts within the sample (ALS ND).

Only 0.4% of the dissolved/total parameter pairs had dissolved concentrations >1.2× the total concentrations where the dissolved concentration was also >5× the MDL (8 out of a total of 1,929 parameter pairs). Dissolved concentrations >1.2× total concentrations were observed on four occasions in early June 2022: molybdenum at D1-Deep and D1-Shallow and selenium at W1-Deep and PC1, as well as on four occasions in October 2022: organic carbon at MD and PR3, methylmercury at BEA, and selenium at D1-Shallow. No substantial effect on data quality is expected

as the dissolved concentrations were only slightly greater than 1.2× the total concentration and all results were within historical ranges (Table 9 of Appendix C).

3.3. Sediment Quality

3.3.1. Williston and Dinosaur Reservoirs

Sediment quality samples were collected from nearshore depositional areas (i.e., areas of predominantly fine substrates) at sites within Dinosaur (D1) and Williston (W1) reservoirs in October 2022. Particle size distributions at W1 and D1 were similar; silt was the dominant substrate reported at both sites (82.5% at W1 and 73.9% at D1; Table 42 and Figure 2 in Appendix A).

Carbon content and nutrient concentrations were generally low at both reservoir sites. Nutrient concentrations (nitrate, nitrite, phosphate, and ammonium) were below the MDL for all parameters at both sites for except for ammonium at D1. Furthermore, sediment pH was slightly alkaline at both sites and ranged from 8.14 at D1 to 8.27 at W1 (Table 42 of Appendix A).

Arsenic, cadmium, and nickel concentrations in sediments collected at D1 and W1 exceeded the BC Working Freshwater ISQG but were below the BC Working Freshwater PEL. No other exceedances of the BC WSQG were observed in 2022 (Table 43 of Appendix A).

3.3.2. Peace River Site C Reservoir Reach

Sediment quality samples were collected from nearshore depositional areas (i.e., areas of predominantly fine substrates) at all Site C Reservoir Reach (Peace River and Upstream Tributaries) sites in October 2022. Particle size distributions varied among sites; sediments generally consisted mostly of sand at PR3 and MD, and mostly of silt at PR1, PR2 and HD. Sediments at PC1 below the Dinosaur Reservoir were generally coarser than other sites with gravel being the dominant substrate (Table 42 and Figure 2 in Appendix A).

Carbon content and nutrient concentrations were generally low at all Site C Reservoir Reach sites. Nutrient concentrations (nitrate, nitrite, phosphate) were below the MDL for all parameters at all sites (Table 42 of Appendix A). However, ammonium concentrations were above the MDL and ranged from 1.3 mg/kg at MD to 10.4 mg/kg at PR2. pH was slightly alkaline across all sites and ranged from 8.08 at PR1 and PR2 to 8.70 at PC1 (Table 42 of Appendix A).

Arsenic (PC1, PR3, HD, MD), cadmium (PR2, HD), copper (PC1), iron (PC1), and nickel (PC1, PR1, PR2, PR3, HD, MD) exceeded the BC Freshwater ISQG but not the PEL. No other exceedances of the BC WSQG were observed in October 2022 (Table 43 of Appendix A).

3.3.3. Peace River Downstream Reach

Sediment quality samples were collected from nearshore depositional areas (i.e., areas of predominantly fine substrates) at all sites within the Downstream Reach (Peace River and Downstream Tributaries). Particle size distributions varied among sites. Aside from PINE and PD5, where sediments were comprised mostly of silt (59.3% silt at PINE and 68.1% silt at PD5), sand was the dominant substrate at all sites within the Downstream Reach (% sand ranged between 44.2% at PD1 and 90.6% at POUCE; Table 42 and Figure 2 in Appendix A).

Carbon content and nutrient concentrations were generally low at all Downstream Reach sites. Nutrient concentrations (nitrate, nitrite, phosphate) were below the MDL at all sites except for phosphate at BEA and ammonium concentrations which were above the MDL at all sites and ranged from 1.1 mg/kg at KR to 11.8 mg/kg at PD1 (Table 42 of Appendix A). pH was slightly alkaline across all sites and ranged from 7.93 at PD1 to 8.51 at KR (Table 42 of Appendix A).

Arsenic (all sites), cadmium (PD1 and PD5), and nickel (all sites except POUCE) exceeded the BC Freshwater ISQG but not the PEL. No other exceedances of the BC WSQG were observed in October 2022 (Table 43 of Appendix A).

3.3.4. QA/QC

Overall QA/QC objectives for sediment quality analysis were met in 2022. All QA/QC issues were reviewed, and no data were excluded due to QA/QC failures in 2022. In contrast to water quality sampling, there were no outliers, omitted parameters, or field sampling issues associated with sediment quality sampling. Details regarding QA/QC objectives are described below.

Results of the sediment quality analysis QA/QC checks and procedures completed in 2022 are provided in summary tables in Appendix C. The number of QA/QC laboratory samples (two replicates and one equipment blank) comprised 15% (three of 20 samples) of the overall sampling program based on the total number of sediment quality samples collected in 2022, thus surpassing the QA/QC objective of at least 10% QA/QC effort.

No hold time exceedances occurred in 2022 for sediment quality samples, apart from pH which has a hold time of only 15 minutes (laboratory analysis within this time frame is not practical).

The 2022 equipment blank results were non-detectable (below the MDL) for 73.1% (38/52) of the results. Out of the 14 observed detections, there were five detections that were >5× the MDL, namely aluminum, barium, iron, magnesium, and manganese. These parameter values were comparable to those previously reported by SEES JV (2020a); therefore, no substantial effect on data quality is expected (Tables 2 and 4 of Appendix C). Note that the equipment blank was not analyzed for the following sediment quality parameters: available nitrate and nitrite as N (although nitrate and nitrite were analyzed individually), inorganic carbon (as $CaCO_3$), organic matter, and pH.

Elevated variability between duplicate laboratory samples (RPD >20%) was observed at site PC1 for % Clay (<4 µm), % Sand (0.125 mm – 0.25 mm), % Sand (0.25 mm – 0.50 mm), % Sand (1.0 mm – 2.0 mm), % Silt (0.004 mm – 0.0312 mm), aluminum, beryllium, calcium, copper, lead, lithium, strontium, titanium, and zinc (Table 10 of Appendix C). Variability greater than the QA/QC objective thresholds occurred in 14 of 112 measurements (12.5%). These results are thought to reflect real heterogeneity in the Peace River; therefore, no substantial effect on data quality is expected.

4. DISCUSSION

The objectives of Mon-8 and Mon-9 in 2022 were successfully met by contributing to the FAHMFP through characterizing the water and sediment quality conditions within the Peace River and its tributaries as it relates to the Project.

4.1. Fisheries Management Questions and Management Hypotheses

Mon-8 and Mon-9 were developed to monitor water and sediment quality in the Site C Reservoir and Peace River to address the fisheries management questions listed in the FAHMFP (see Section 1).

The management questions and hypotheses outlined in Section 1.1 and Section 1.2 will require several years of data collection before the questions can be definitively addressed. This report is the fifth year of data collection for these two monitoring programs under the FAHMFP.

4.2. Discussion of Results

Within both the Site C Reservoir and Downstream reaches, the tributaries generally showed more turbid waters with higher metals concentrations than the mainstem of the Peace River; this observation is consistent with water quality monitoring in previous years (SEES JV 2020a). Within the Site C Reservoir Reach, exceedances of the BC WQG-AL were only observed for total iron, total zinc, and DO. These water quality parameters were also exceeded in the Downstream Reach where dissolved iron and total silver were also above the BC WQG-AL. Instances where DO concentrations did not meet the 9 mg/L BC WQG-AL minimum applicable to buried embryo and alevin life stages were prevalent throughout all sampling periods, while metal exceedances only occurred during freshet in early June. No exceedances of the BC WQG-AL were observed in the Upstream Reservoirs.

All sediment quality parameters met the BC Working Freshwater PEL and most parameters met the BC Working Freshwater ISQG, with the exception of arsenic, cadmium, nickel, copper, and iron. Exceedances of arsenic, cadmium, and nickel were common throughout the Upstream Reservoirs, Site C Reservoir Reach, and Downstream Reach of the Peace River.

The 2022 results for the five selected water quality parameters which characterize the trophic status in the Peace River and tributaries and which may influence fish health (total nitrogen, total phosphorus, TOC, total iron, and chlorophyll-*a*) were comparable to the pre-construction and construction phases. Consistent with results from previous years (SEES JV 2020a), elevated concentrations and increased variability were generally observed during freshet in early June (sampled instead of May in 2022).

5. CLOSURE

We trust that this report meets your requirements with respect to an annual data summary of water and sediment quality data collected under Mon-8 and Mon-9 for Construction Year 8 (2022).

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APPENDICES

Appendix A. 2022 Water Quality Data Tables and Sediment Quality Monitoring Data Tables and Figures

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1. 2022 UPSTREAM RESERVOIR DEPTH PROFILES

Figure 1. Water temperature profiles for Dinosaur and Williston Reservoirs in 2022

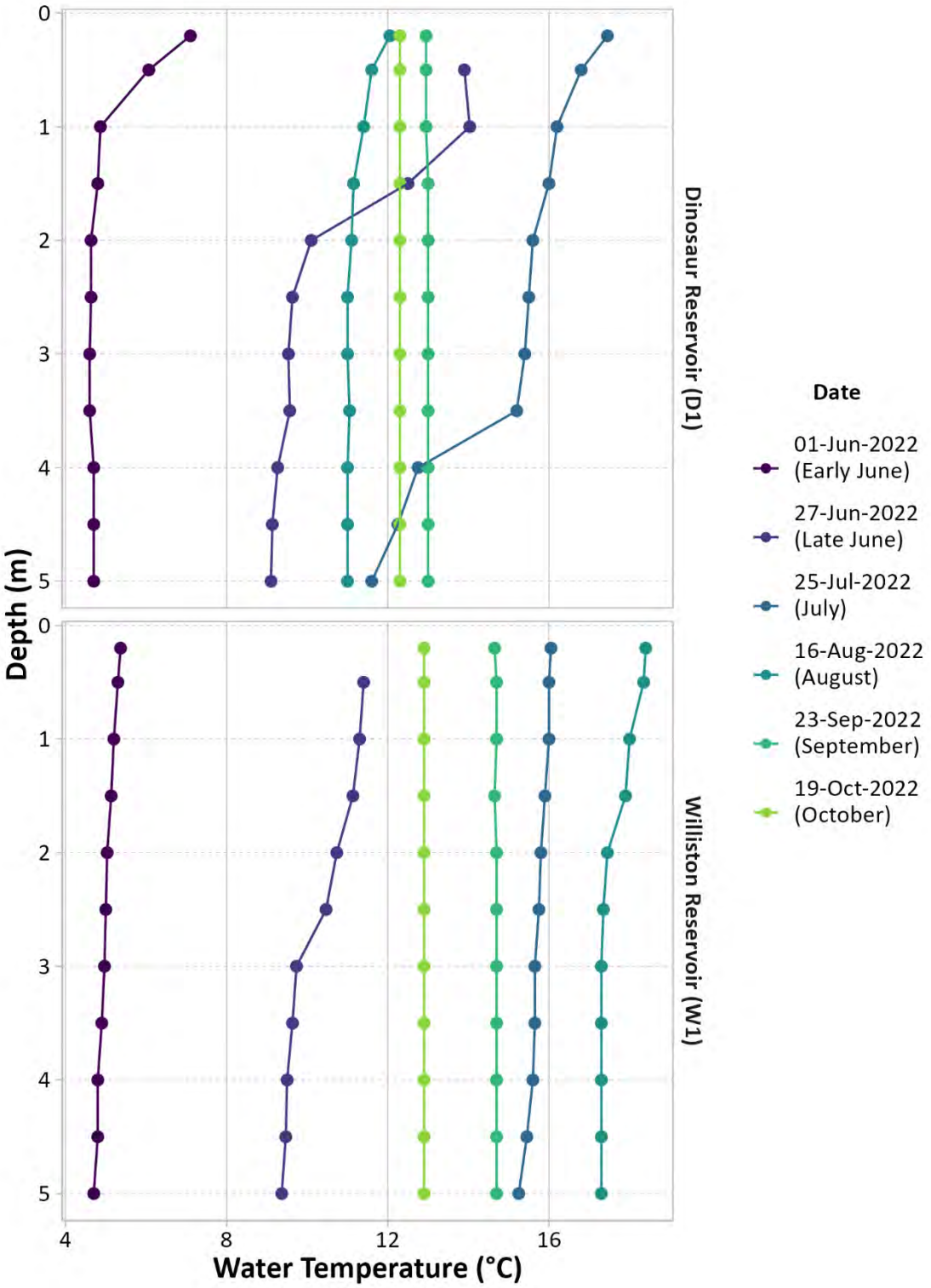


Table 1. Summary of depth profile measurements of general *in situ* parameters at Williston Reservoir (W1).

Parameter				Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)	pH (pH units)	Redox Potential (mV)	Electrical Conductivity (µs/cm)	Specific Conductivity (µs/cm)	Turbidity (NTU)	TDS (mg/L)
BC WQG Short-Term Max[1]						>5/>9[2]		6.5 - 9.0[3]					
Sampling Date	Secchi Depth (m)	Total Depth (m)	Sample Depth (m)										
01-Jun-2022	5.00	60.0	0.2	5.37	0.09	11.7	-	7.62	151	115	184	0.327	120
			0.5	5.30	0.09	11.7	-	7.62	151	115	184	0.343	120
			1.0	5.20	0.09	11.7	-	7.61	150	115	184	0.353	120
			1.5	5.13	0.09	11.7	-	7.62	149	114	184	0.347	120
			2.0	5.03	0.09	11.7	-	7.61	148	114	184	0.357	120
			2.5	5.00	0.09	11.7	-	7.60	147	114	184	0.333	120
			3.0	4.97	0.09	11.7	-	7.60	146	114	184	0.323	120
			3.5	4.90	0.09	11.7	-	7.59	144	114	184	0.360	120
			4.0	4.80	0.09	11.7	-	7.59	142	113	184	0.380	120
			4.5	4.80	0.09	11.7	-	7.59	140	113	184	0.347	120
			5.0	4.70	0.09	11.7	-	7.60	136	113	184	0.383	120
27-Jun-2022	3.20	52.2	0.5	11.4	0.09	10.9	99.8	8.01	157	137	185	1.90	120
			1.0	11.3	0.09	10.9	99.6	7.99	157	136	185	1.73	120
			1.5	11.1	0.09	10.9	99.5	7.98	157	136	185	1.86	120
			2.0	10.7	0.09	11.0	99.0	7.99	157	134	184	1.89	120
			2.5	10.5	0.09	11.1	99.0	7.98	156	133	184	1.59	120
			3.0	9.73	0.09	11.1	98.0	7.96	157	130	184	1.09	119
			3.5	9.63	0.09	11.2	98.2	7.96	156	130	184	1.03	120
			4.0	9.50	0.09	11.2	98.2	7.96	155	130	184	1.01	120
			4.5	9.47	0.09	11.2	98.3	7.96	153	130	184	0.940	120
			5.0	9.37	0.09	11.2	98.1	7.96	152	129	184	0.940	120
25-Jul-2022	1.95	121	0.2	16.0	0.09	9.89	100	8.17	137	153	185	1.88	120
			0.5	16.0	0.09	9.88	100	8.16	138	153	185	2.42	120
			1.0	16.0	0.09	9.88	100	8.16	139	153	185	2.33	120
			1.5	15.9	0.09	9.90	100	8.16	139	152	185	2.22	120
			2.0	15.8	0.09	9.91	100	8.16	139	152	185	2.10	120
			2.5	15.8	0.09	9.91	99.9	8.14	139	152	185	1.98	120
			3.0	15.6	0.09	9.91	99.6	8.14	139	152	185	2.01	120
			3.5	15.6	0.09	9.90	99.5	8.13	139	152	185	1.98	120
			4.0	15.6	0.09	9.89	99.3	8.13	139	151	185	1.80	120
			4.5	15.4	0.09	9.88	98.8	8.11	139	151	184	1.99	120
			5.0	15.2	0.09	9.87	98.5	8.11	138	150	184	2.22	120

[1]BC WQG Short-Term Max is the short-term acute British Columbia Water Quality Guideline for the protection of aquatic life (BC WQG-AL; BC ENV 2021a)

[2]The >5 mg/L guideline is for all life stages other than buried embryo/alevin and the >9 mg/L guideline is for buried embryo/alevin life stages. The dissolved oxygen guidelines are minimum guidelines.

[3]The BC WQG-AL specify that no statistically significant change from background should occur if pH is outside of the range 6.5-9.0.

"-" indicates the parameter was not measured.

Table 1. Continued (2 of 2).

Parameter				Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)	pH (pH units)	Redox Potential (mV)	Electrical Conductivity (µs/cm)	Specific Conductivity (µs/cm)	Turbidity (NTU)	TDS (mg/L)
BC WQG Short-Term Max[1]						>5/>9[2]		6.5 - 9.0[3]					
Sampling Date	Secchi Depth (m)	Total Depth (m)	Sample Depth (m)										
16-Aug-2022	3.11	57.1	0.2	18.4	0.09	9.06	96.4	8.12	154	161	185	0.905	120
			0.5	18.4	0.09	9.06	96.4	8.10	155	161	185	0.795	120
			1.0	18.0	0.09	9.10	96.1	8.10	154	160	184	0.770	120
			1.5	17.9	0.09	9.09	95.9	8.10	154	159	184	0.805	120
			2.0	17.4	0.09	9.12	95.4	8.11	153	158	184	0.745	120
			2.5	17.4	0.09	9.12	95.1	8.10	153	157	184	0.845	120
			3.0	17.3	0.09	9.10	94.9	8.12	153	157	184	0.835	120
			3.5	17.3	0.09	9.09	94.8	8.10	154	157	184	0.870	120
			4.0	17.3	0.09	9.10	94.8	8.09	155	157	184	0.815	120
			4.5	17.3	0.09	9.07	94.6	8.09	155	157	184	0.880	120
			5.0	17.3	0.09	9.07	94.4	8.09	155	157	184	0.825	120
23-Sep-2022	-	67.9	0.2	14.6	0.08	9.16	90.3	7.80	113	144	179	0.980	116
			0.5	14.7	0.08	9.16	90.2	7.80	113	144	179	0.955	116
			1.0	14.7	0.08	9.16	90.2	7.80	112	144	179	0.920	116
			1.5	14.6	0.08	9.16	90.2	7.79	112	144	179	0.885	116
			2.0	14.7	0.08	9.14	90.1	7.78	112	144	179	0.775	116
			2.5	14.7	0.08	9.14	90.1	7.78	112	144	179	0.745	116
			3.0	14.7	0.08	9.14	90.0	7.78	112	144	179	0.585	116
			3.5	14.7	0.08	9.14	90.0	7.78	112	144	179	0.530	116
			4.0	14.7	0.08	9.14	90.0	7.78	112	144	179	0.415	116
			4.5	14.7	0.08	9.14	90.0	7.78	112	144	179	0.365	116
			5.0	14.7	0.08	9.13	90.0	7.78	111	144	179	0.240	116
19-Oct-2022	-	133	0.2	12.9	0.08	9.58	90.7	8.58	136	130	169	0.320	110
			0.5	12.9	0.08	9.57	90.6	8.46	145	130	169	0.345	110
			1.0	12.9	0.08	9.56	90.4	8.45	145	130	169	0.335	110
			1.5	12.9	0.08	9.56	90.6	8.44	146	130	169	0.340	110
			2.0	12.9	0.08	9.56	90.6	8.43	146	130	169	0.340	110
			2.5	12.9	0.08	9.56	90.6	8.44	146	130	169	0.355	110
			3.0	12.9	0.08	9.55	90.5	8.44	146	130	169	0.460	110
			3.5	12.9	0.08	9.54	90.4	8.43	146	130	169	0.335	110
			4.0	12.9	0.08	9.54	90.4	8.44	146	130	169	0.355	110
			4.5	12.9	0.08	9.54	90.4	8.43	146	130	169	0.360	110
			5.0	12.9	0.08	9.55	90.5	8.43	146	130	169	0.335	110

[1]BC WQG Short-Term Max is the short-term acute British Columbia Water Quality Guideline for the protection of aquatic life (BC WQG-AL; BC ENV 2021a)

[2]The >5 mg/L guideline is for all life stages other than buried embryo/alevin and the >9 mg/L guideline is for buried embryo/alevin life stages. The dissolved oxygen guidelines are minimum guidelines.

[3]The BC WQG-AL specify that no statistically significant change from background should occur if pH is outside of the range 6.5-9.0.

"-" indicates the parameter was not measured.

Table 2. Summary of depth profile measurements of general *in situ* parameters at Dinosaur Reservoir (D1).

Parameter				Water Temperature (°C)	Salinity (ppt)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)	pH (pH units)	Redox Potential (mV)	Electrical Conductivity (µs/cm)	Specific Conductivity (µs/cm)	Turbidity (NTU)	TDS (mg/L)
BC WQG Short-Term Max[1]						>5/>9[2]		6.5 - 9.0[3]					
Sampling Date	Secchi Depth (m)	Total Depth (m)	Sample Depth (m)										
01-Jun-2022	0.400	35.0	0.2	7.10	0.09	11.8	-	7.91	187	120	182	21.6	118
			0.5	6.07	0.09	11.7	-	7.90	190	117	184	24.5	119
			1.0	4.87	0.09	11.9	-	7.91	192	112	182	24.0	119
			1.5	4.80	0.09	11.9	-	7.91	193	112	182	24.5	119
			2.0	4.63	0.09	11.9	-	7.93	193	112	182	22.1	119
			2.5	4.63	0.09	11.9	-	7.91	195	111	182	21.1	119
			3.0	4.60	0.09	11.9	-	7.90	197	111	182	21.3	119
			3.5	4.60	0.09	11.9	-	7.91	197	111	182	22.4	118
			4.0	4.70	0.09	12.0	-	7.89	199	111	181	29.7	118
			4.5	4.70	0.09	12.0	-	7.92	198	111	181	34.6	117
			5.0	4.70	0.09	12.0	-	7.91	200	110	180	34.8	117
27-Jun-2022	0.710	39.5	0.5	13.9	0.09	10.5	102	7.98	165	147	187	10.7	122
			1.0	14.0	0.09	10.5	102	7.97	166	148	187	10.5	121
			1.5	12.5	0.09	10.7	100	7.92	168	143	188	9.99	122
			2.0	10.1	0.09	11.0	98.1	7.90	168	133	185	10.4	121
			2.5	9.63	0.09	11.2	98.0	7.89	168	130	185	9.76	120
			3.0	9.53	0.09	11.2	97.9	7.86	169	130	184	9.52	120
			3.5	9.57	0.09	11.2	97.8	7.86	169	130	184	9.80	120
			4.0	9.27	0.09	11.2	97.5	7.86	169	129	184	10.6	120
			4.5	9.13	0.09	11.2	97.2	7.86	169	128	184	11.9	120
			5.0	9.10	0.09	11.2	97.3	7.87	168	128	184	11.0	120
25-Jul-2022	4.15	36.8	0.2	17.4	0.09	10.3	108	8.28	146	161	188	0.160	122
			0.5	16.8	0.09	10.4	107	8.25	147	159	188	0.305	122
			1.0	16.2	0.09	10.5	107	8.26	147	156	188	0.385	122
			1.5	16.0	0.09	10.5	107	8.24	147	155	188	0.415	122
			2.0	15.6	0.09	10.6	106	8.24	148	154	187	0.400	122
			2.5	15.5	0.09	10.6	106	8.23	148	153	187	0.360	122
			3.0	15.4	0.09	10.6	106	8.22	148	153	187	0.320	122
			3.5	15.2	0.09	10.6	105	8.20	148	152	187	0.340	122
			4.0	12.8	0.09	10.8	102	8.10	146	143	187	0.370	121
			4.5	12.2	0.09	10.8	101	8.06	150	141	186	0.330	121
			5.0	11.6	0.09	10.8	99.0	8.04	150	138	185	0.320	120

[1]BC WQG Short-Term Max is the short-term acute British Columbia Water Quality Guideline for the protection of aquatic life (BC WQG-AL; BC ENV 2021a)

[2]The >5 mg/L guideline is for all life stages other than buried embryo/alevin and the >9 mg/L guideline is for buried embryo/alevin life stages. The dissolved oxygen guidelines are minimum guidelines.

[3]The BC WQG-AL specify that no statistically significant change from background should occur if pH is outside of the range 6.5-9.0.

"-" indicates the parameter was not measured.

2. 2022 WATER QUALITY TABLES

Table 3. Field measurements, physical tests, anions, nutrients, organic carbon, and chlorophyll-*a* in water quality samples collected from the Williston and Dinosaur reservoirs in early June 2022.

Date	Units	01-Jun-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		60.0						35.0						
Sample Depth (m)		0.2			5.0			0.2			5.0			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	115.2	115.1	115.1	112.8	112.8	112.8	119.7	120.2	120.2	110.4	110.5	110.4	
Oxygen Dissolved (in situ)	mg/L	11.69	11.69	11.69	11.7	11.69	11.7	11.75	11.78	11.74	11.96	11.96	11.96	>5/>9
Redox Potential (in situ)	mV	151.1	151.2	151.3	135.3	136.4	137.1	187.9	187.5	186.6	200.1	199.6	199.3	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Secchi Depth	m	5.0			5.0			0.4			0.4			
Specific Conductivity (in situ)	µS/cm	184.4	184.4	184.3	184.3	184.4	184.4	182.3	182.5	182.2	180.5	180.5	180.5	
Temperature (in situ)	°C	5.4	5.3	5.4	4.7	4.7	4.7	7.0	7.1	7.2	4.7	4.7	4.7	
Total Dissolved Solids (in situ)	mg/L	120	120	120	120	120	120	118	119	118	117	117	117	
Turbidity (in situ)	NTU	0.35	0.32	0.31	0.39	0.39	0.37	21.49	21.89	21.53	34.66	34.93	34.74	
pH (in situ)	pH units	7.62	7.62	7.63	7.61	7.60	7.60	7.91	7.91	7.92	7.91	7.91	7.91	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	84.7			85.1			83.6			83.5			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	84.7			85.1			83.6			83.5			
Colour, True	TCU[1]	12.1			7.4			10.8			13.5			
Dissolved Hardness (as $CaCO_3$)	mg/L	94.7			96.0			95.8			94.4			
Specific Conductivity (lab)	µS/cm	192			189			189			189			
Total Dissolved Solids	mg/L	112			108			115			118			
Total Suspended Solids	mg/L	<3.0			<3.0			11.0			18.0			
pH (lab)	pH units	8.12			8.11			8.11			8.10			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	<0.0050			<0.0050			0.0155			0.0143			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.042			0.043			0.045			0.046			EQ
Nitrate (as N)	mg/L	0.0774			0.0763			0.0782			0.0833			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			0.0015			0.0022			
Phosphorus (P) - Total	mg/L	<0.0020			<0.0020			0.0028			0.0478			
Phosphorus (P) - Total Dissolved	mg/L	0.0024			0.0026			0.0332			0.0038			
Sulfate (SO_4)	mg/L	15.2			15.3			15.0			14.7			
Total Kjeldahl Nitrogen	mg/L	0.074			0.061			0.082			0.093			
Total Nitrogen	mg/L	0.151			0.137			0.160			0.176			
Organic Carbon														
Dissolved Organic Carbon	mg/L	2.64			2.92			3.77			3.74			
Total Organic Carbon	mg/L	2.58			2.49			3.20			4.11			
Plant Pigments														
Chlorophyll-*a*	µg/L	0.795			0.782			0.838			0.946			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

Dissolved oxygen saturation (Oxygen Dissolved (in situ) (%)) was not recorded during the early June sampling event.

Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the early June sampling event. These parameters were not required as part of the RFQ and were added to the analysis during subsequent sampling events in 2022.

[1]True Colour Units.

Table 4. Dissolved metals concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in early June 2022.

Date	Units	01-Jun-2022				BC Short-Term Maximum WQG
Site		W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	
Total Depth (m)		60.0		35.0		
Sample Depth (m)		0.2	5.0	0.2	5.0	
Replicate		A	A	A	A	
Dissolved Metals						
Aluminum (Al) - Dissolved	mg/L	0.0038	0.0040	0.0169	0.0188	
Antimony (Sb) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As) - Dissolved	mg/L	0.00016	0.00016	0.00018	0.00017	
Barium (Ba) - Dissolved	mg/L	0.0302	0.0308	0.0365	0.0409	
Beryllium (Be) - Dissolved	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	mg/L	<0.010	<0.010	<0.010	<0.010	
Cadmium (Cd) - Dissolved	mg/L	0.0000145	0.0000106	0.0000160	0.0000154	EQ
Calcium (Ca) - Dissolved	mg/L	28.1	28.6	28.2	27.8	
Cesium (Cs) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Copper (Cu) - Dissolved	mg/L	0.00062	0.00063	0.00066	0.00071	EQ
Iron (Fe) - Dissolved	mg/L	<0.010	<0.010	0.019	0.031	0.35
Lead (Pb) - Dissolved	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li) - Dissolved	mg/L	0.0011	0.0011	0.0013	0.0013	
Magnesium (Mg) - Dissolved	mg/L	5.95	5.97	6.16	6.08	
Manganese (Mn) - Dissolved	mg/L	0.00080	0.00092	0.00203	0.00273	
Mercury (Hg) - Dissolved	mg/L	<0.00000050	<0.00000050	0.00000085	0.00000096	
Methylmercury (MeHg) - Dissolved	mg/L	<0.000000020	<0.000000020	<0.000000020	<0.000000020	
Molybdenum (Mo) - Dissolved	mg/L	0.000816	0.000792	0.000760	0.000720	
Nickel (Ni) - Dissolved	mg/L	0.00076	0.00076	0.00083	0.00087	
Phosphorus (P) - Dissolved	mg/L	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	mg/L	0.425	0.443	0.450	0.455	
Rubidium (Rb) - Dissolved	mg/L	0.00028	0.00029	0.00025	0.00026	
Selenium (Se) - Dissolved	mg/L	0.000307	0.000353	0.000291	0.000275	
Silicon (Si) - Dissolved	mg/L	2.26	2.32	2.33	2.26	
Silver (Ag) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	mg/L	1.10	1.10	1.14	1.13	
Strontium (Sr) - Dissolved	mg/L	0.110	0.112	0.108	0.109	
Sulfur (S) - Dissolved	mg/L	4.87	5.04	4.91	4.72	
Tellurium (Te) - Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	mg/L	<0.00030	<0.00030	0.00030	0.00031	
Tungsten (W) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	mg/L	0.000477	0.000464	0.000473	0.000464	
Vanadium (V) - Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn) - Dissolved	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 5. Total metals concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in early June 2022.

Date	Units	01-Jun-2022				BC Short-Term Maximum WQG
Site		W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	
Total Depth (m)		60.0		35.0		
Sample Depth (m)		0.2	5.0	0.2	5.0	
Replicate		A	A	A	A	
Total Metals						
Aluminum (Al) - Total	mg/L	0.0197	0.0135	0.333	0.168	
Antimony (Sb) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As) - Total	mg/L	0.00020	0.00019	0.00035	0.00034	
Barium (Ba) - Total	mg/L	0.0301	0.0302	0.0570	0.0644	
Beryllium (Be) - Total	mg/L	<0.000020	<0.000020	0.000022	0.000022	
Bismuth (Bi) - Total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Total	mg/L	<0.010	<0.010	<0.010	<0.010	1.2
Cadmium (Cd) - Total	mg/L	0.0000146	0.0000170	0.0000456	0.0000534	
Calcium (Ca) - Total	mg/L	28.7	29.2	28.1	28.0	
Cesium (Cs) - Total	mg/L	<0.000010	<0.000010	0.000066	0.000037	
Chromium (Cr) - Total	mg/L	<0.00050	<0.00050	0.00071	<0.00050	
Cobalt (Co) - Total	mg/L	<0.00010	<0.00010	0.00024	0.00028	0.11
Copper (Cu) - Total	mg/L	0.00064	0.00063	0.00116	0.00135	
Iron (Fe) - Total	mg/L	0.024	0.018	0.399	0.376	1
Lead (Pb) - Total	mg/L	<0.000050	<0.000050	0.000364	0.000460	EQ
Lithium (Li) - Total	mg/L	0.0012	0.0012	0.0016	0.0016	
Magnesium (Mg) - Total	mg/L	6.18	6.03	6.34	6.40	
Manganese (Mn) - Total	mg/L	0.00178	0.00176	0.00977	0.0132	EQ
Mercury (Hg) - Total	mg/L	<0.00000050	<0.00000050	0.00000249	0.00000374	
Methylmercury (MeHg) - Total	mg/L	0.000000038	<0.000000020	0.000000026	0.000000038	
Molybdenum (Mo) - Total	mg/L	0.000841	0.000826	0.000593	0.000417	46
Nickel (Ni) - Total	mg/L	0.00080	0.00081	0.00150	0.00192	
Phosphorus (P) - Total	mg/L	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Total	mg/L	0.418	0.430	0.549	0.515	
Rubidium (Rb) - Total	mg/L	0.00026	0.00033	0.00095	0.00067	
Selenium (Se) - Total	mg/L	0.000344	0.000282	0.000309	0.000267	
Silicon (Si) - Total	mg/L	2.31	2.46	2.95	2.48	
Silver (Ag) - Total	mg/L	<0.000030	<0.000030	<0.000020	<0.000020	EQ
Sodium (Na) - Total	mg/L	1.07	1.12	1.13	1.20	
Strontium (Sr) - Total	mg/L	0.122	0.123	0.124	0.120	
Sulfur (S) - Total	mg/L	4.80	4.96	4.90	4.94	
Tellurium (Te) - Total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	mg/L	<0.00060	<0.00030	<0.00810	0.00156	
Tungsten (W) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	mg/L	0.000476	0.000485	0.000511	0.000514	
Vanadium (V) - Total	mg/L	<0.00050	<0.00050	0.00150	0.00099	
Zinc (Zn) - Total	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	EQ
Zirconium (Zr) - Total	mg/L	<0.00020	<0.00020	0.00040	<0.00020	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

Table 6. Field measurements, physical tests, anions, nutrients, organic carbon, chlorophyll-*a*, and dissolved metal concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in late June 2022.

Date	Units	27-Jun-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		66.5			52.2			33.7			39.5			
Sample Depth (m)		0.2			5.0			0.2			5.0			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	136.8	136.5	136.8	129.4	129.4	129.5	148.5	148.1	148.5	128.2	128.3	128.4	
Oxygen Dissolved (in situ)	mg/L	10.89	10.9	10.9	11.21	11.21	11.21	10.43	10.49	10.41	11.19	11.19	11.19	>5/>9
Oxygen Dissolved (in situ)	%	99.9	99.8	99.9	98	98	98	101.4	101.8	101.1	97.1	97.1	97.2	
Redox Potential (in situ)	mV	159.9	159.9	159.8	146.8	147.1	147.7	168	167.7	166.7	162.7	162.6	162.9	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Secchi Depth	m	2.9			3.2			0.8			0.7			
Specific Conductivity (in situ)	µS/cm	184.5	184.4	184.5	184.2	184.2	184.3	187.7	187.6	187.9	184.3	184.4	184.2	
Temperature (in situ)	°C	11.5	11.4	11.5	9.4	9.4	9.4	14.1	14.0	14.0	9.1	9.1	9.1	
Total Dissolved Solids (in situ)	mg/L	120	120	120	120	120	120	122	122	122	120	120	120	
Turbidity (in situ)	NTU	1.42	1.45	1.34	1	0.95	0.92	10.84	10.96	10.86	10.7	10.23	10.7	
pH (in situ)	pH units	7.97	7.96	7.97	7.96	7.96	7.96	7.97	7.96	7.97	7.86	7.86	7.85	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	90.5			85.1			111			98.7			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	90.5			85.1			111			98.7			
Colour, True	TCU[1]	5.3			6.2			11.0			11.0			
Dissolved Hardness (as $CaCO_3$)	mg/L	93.4			92.2			93.7			94.1			
Specific Conductivity (lab)	µS/cm	182			181			185			182			
Total Dissolved Solids	mg/L	114			112			121			125			
Total Suspended Solids	mg/L	<3.0			<3.0			3.2			5.2			
pH (lab)	pH units	8.03			8.04			7.99			7.99			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	<0.0050			<0.0050			<0.0050			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.031			0.027			0.034			0.031			EQ
Nitrate (as N)	mg/L	0.0636			0.0666			0.0397			0.0590			32.8
Nitrite (as N)	mg/L	0.0010			<0.0010			<0.0010			<0.0010			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			0.0022			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0044			0.0033			0.0161			0.0153			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			0.0024			<0.0020			
Silicate (as SiO_2)	mg/L	4.63			4.65			4.69			4.70			
Sulfate (SO_4)	mg/L	13.3			13.2			13.8			12.9			
Total Kjeldahl Nitrogen	mg/L	0.078			0.070			0.193			0.126			
Total Nitrogen	mg/L	0.143			0.137			0.233			0.185			
Organic Carbon														
Dissolved Organic Carbon	mg/L	2.70			2.59			4.01			4.04			
Total Organic Carbon	mg/L	2.66			2.72			4.11			3.99			
Ion Balance														
Anion Sum	mEq/L	2.09			1.98			2.51			2.25			
Cation - Anion Balance	% difference	3.98			2.06			12.6			7.14			
Cation Sum	mEq/L	1.93			1.90			1.95			1.95			
Plant Pigments														
Chlorophyll-*a*	µg/L	1.02			1.47			2.77			0.974			
Dissolved Metals														
Calcium (Ca) - Dissolved	mg/L	26.4			26.3			26.5			26.5			
Magnesium (Mg) - Dissolved	mg/L	6.68			6.44			6.69			6.79			
Potassium (K) - Dissolved	mg/L	0.483			0.467			0.522			0.509			
Sodium (Na) - Dissolved	mg/L	1.19			1.16			1.39			1.31			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

[1]True Colour Units.

Table 7. Field measurements, physical tests, anions, nutrients, organic carbon, chlorophyll-*a*, and dissolved metal concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in July 2022.

Date	Units	25-Jul-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		158.0			121.0			42.8			36.8			
Sample Depth (m)		0.2			5.0			0.2			5.0			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	152.6	152.7	152.7	149.5	149.5	149.5	159.8	160.1	159.8	138.6	138.9	139.4	
Oxygen Dissolved (in situ)	mg/L	9.9	9.9	9.9	9.84	9.84	9.84	10.37	10.37	10.39	10.77	10.75	10.76	>5/>9
Oxygen Dissolved (in situ)	%	100.2	100.2	100.2	97.7	97.7	97.7	107.3	107.6	107.6	99.4	99.4	99.8	
Redox Potential (in situ)	mV	133.8	134	134.3	147.9	147.7	147.5	140.1	140.2	139.7	144.4	144.5	144.5	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Secchi Depth	m	2.5			1.9			4.2			4.2			
Specific Conductivity (in situ)	µS/cm	184.6	184.6	184.6	184.6	184.7	184.7	188.7	188.5	188.6	185.5	185.5	185.7	
Temperature (in situ)	°C	15.9	15.9	16.0	15	15	15	17	17.1	17	11.8	11.9	11.9	
Total Dissolved Solids (in situ)	mg/L	120	120	120	120	120	120	123	123	123	121	121	121	
Turbidity (in situ)	NTU	1.65	1.64	1.63	2.57	2.54	2.59	0.30	0.26	0.27	0.30	0.31	0.35	
pH (in situ)	pH units	8.18	8.18	8.18	8.00	8.00	8.00	8.24	8.24	8.25	8.05	8.04	8.04	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	108			86.4			92.2			87.7			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	108			86.4			92.2			87.7			
Colour, True	TCU[1]	5.1			5.4			5.3			5.3			
Dissolved Hardness (as $CaCO_3$)	mg/L	89.6			90.0			91.6			90.6			
Specific Conductivity (lab)	µS/cm	174			175			177			178			
Total Dissolved Solids	mg/L	132			118			119			120			
Total Suspended Solids	mg/L	<3.0			4.5			<3.0			<3.0			
pH (lab)	pH units	8.08			8.05			8.09			8.03			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	0.0095			0.0092			<0.0050			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.036			0.036			0.040			0.037			EQ
Nitrate (as N)	mg/L	0.0422			0.0444			0.0376			0.0606			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0055			0.0080			0.0035			0.0038			
Phosphorus (P) - Total Dissolved	mg/L	0.0036			<0.0020			<0.0020			<0.0020			
Silicate (as SiO_2)	mg/L	4.33			4.33			4.38			4.46			
Sulfate (SO_4)	mg/L	14.1			14.1			14.6			14.1			
Total Kjeldahl Nitrogen	mg/L	0.168			0.106			0.097			0.134			
Total Nitrogen	mg/L	0.210			0.150			0.135			0.195			
Organic Carbon														
Dissolved Organic Carbon	mg/L	2.45			2.85			3.05			2.76			
Total Organic Carbon	mg/L	2.72			2.61			2.87			2.62			
Plant Pigments														
Chlorophyll-*a*	µg/L	3.46			1.68			5.37			1.84			
Dissolved Metals														
Calcium (Ca) - Dissolved	mg/L	25.6			25.7			26.1			25.9			
Magnesium (Mg) - Dissolved	mg/L	6.24			6.26			6.43			6.31			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the July sampling event; these parameters were not requested as part of the RFQ.

[1]True Colour Units.

Table 8. Field measurements, physical tests, anions, nutrients, organic carbon, chlorophyll-*a*, and dissolved metal concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in August 2022.

Date	Units	16-Aug-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		58.8			57.1			30.5			24.8			
Sample Depth (m)		0.2			5.0			0.2			5.0			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	156.8	156.8	156.8	156.8	156.8	156.8	143.7	143.8	143.9	140.1	140.2	140.2	
Oxygen Dissolved (in situ)	mg/L	9.05	9.05	9.05	9.03	9.04	9.04	10.09	10.09	10.11	10.21	10.21	10.21	>5/>9
Oxygen Dissolved (in situ)	%	94.2	94.1	94.1	94	94	94	93.8	94.0	94.0	92.6	92.6	92.7	
Redox Potential (in situ)	mV	168.6	168.8	168.7	173.3	174.1	174.7	176.1	176.5	176.1	196.6	196.3	195.9	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Secchi Depth	m	3.1			3.1			5.0			5.2			
Specific Conductivity (in situ)	µS/cm	184.1	184.0	184.0	184.1	184.0	184.1	190.8	190.7	191.0	191.4	191.4	191.3	
Temperature (in situ)	°C	17.2	17.2	17.2	17.2	17.2	17.2	12.1	12.1	12.1	11	11	11	
Total Dissolved Solids (in situ)	mg/L	120	120	120	120	120	120	124	124	124	124	124	124	
Turbidity (in situ)	NTU	0.77	0.77	0.80	0.83	0.80	0.82	0.45	0.43	0.48	0.42	0.49	0.52	
pH (in situ)	pH units	8.01	8.01	8.01	8.00	7.99	7.99	7.86	7.86	7.87	7.81	7.81	7.82	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	80.1			82.7			83.1			85.7			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	80.1			82.7			83.1			85.7			
Colour, True	TCU[1]	6.9			7.1			8.6			6.9			
Dissolved Hardness (as $CaCO_3$)	mg/L	84.2			89.6			90.4			92.0			
Specific Conductivity (lab)	µS/cm	166			166			174			167			
Total Dissolved Solids	mg/L	105			104			107			108			
Total Suspended Solids	mg/L	<3.0			<3.0			<3.0			<3.0			
pH (lab)	pH units	8.20			8.20			8.13			8.09			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	0.0140			0.0075			0.0064			0.0056			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.026			0.026			0.028			0.026			EQ
Nitrate (as N)	mg/L	0.0550			0.0553			0.0704			0.0729			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			0.0018			0.0022			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0053			0.0045			0.0045			0.0053			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020			
Silicate (as SiO_2)	mg/L	4.28			4.28			4.48			4.46			
Sulfate (SO_4)	mg/L	12.3			12.3			13.3			13.6			
Total Kjeldahl Nitrogen	mg/L	0.072			0.131			<0.050			<0.050			
Total Nitrogen	mg/L	0.127			0.186			0.072			0.075			
Organic Carbon														
Dissolved Organic Carbon	mg/L	3.18			2.73			2.78			3.29			
Total Organic Carbon	mg/L	3.08			2.90			3.10			2.82			
Ion Balance														
Anion Sum	mEq/L	1.86			1.91			1.94			2.00			
Cation - Anion Balance	% difference	3.33			1.60			1.84			2.56			
Cation Sum	mEq/L	1.74			1.85			1.87			1.90			
Plant Pigments														
Chlorophyll-*a*	µg/L	1.03			1.23			0.366			0.461			
Dissolved Metals														
Calcium (Ca) - Dissolved	mg/L	24.2			25.7			25.8			26.1			
Magnesium (Mg) - Dissolved	mg/L	5.77			6.18			6.30			6.52			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

[1]True Colour Units.

Table 9. Field measurements, physical tests, anions, nutrients, organic carbon, chlorophyll-*a,* and dissolved metal concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in September 2022.

Date	Units	23-Sep-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		67.9						44.0						
Sample Depth (m)		0.2			3.5[1]			0.2			3.5[1]			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	143.6	143.2	143.5	143.6	143.6	143.6	141.3	141.4	141.4	141.4	141.3	141.3	
Oxygen Dissolved (in situ)	mg/L	9.16	9.17	9.17	9.16	9.16	9.16	9.58	9.57	9.57	9.58	9.58	9.58	>5/>9
Oxygen Dissolved (in situ)	%	90.2	90.2	90.2	90.2	90.2	90.2	91.0	91.0	91.0	90.9	90.9	90.9	
Redox Potential (in situ)	mV	95.4	97.5	98.6	114.3	114.8	115.5	106.0	105.9	105.5	106.6	106.5	106.5	
Salinity (in situ)	ppt	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	
Specific Conductivity (in situ)	µS/cm	178.9	178.6	179.0	179.0	179.0	179.0	183.3	183.2	183.2	183.5	183.5	183.5	
Temperature (in situ)	°C	14.7	14.6	14.6	14.6	14.7	14.6	13.0	13.0	13.1	13.0	13.0	13.0	
Total Dissolved Solids (in situ)	mg/L	116	116	116	116	116	116	119	119	119	119	119	119	
Turbidity (in situ)	NTU	0.00	0.00	0.00	0.00	0.00	0.00	1.01	1.04	1.06	0.95	1.00	1.01	
pH (in situ)	pH units	7.76	7.75	7.75	7.76	7.76	7.77	7.73	7.74	7.74	7.73	7.73	7.73	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	76.0			78.8			81.4			79.1			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	76.0			78.8			81.4			79.1			
Colour, True	TCU[2]	7.3			7.5			6.7			7.1			
Dissolved Hardness (as $CaCO_3$)	mg/L	91.8			89.6			90.0			91.9			
Specific Conductivity (lab)	µS/cm	163			161			164			166			
Total Dissolved Solids	mg/L	92			84			92			93			
Total Suspended Solids	mg/L	<3.0			<3.0			<3.0			<3.0			
pH (lab)	pH units	7.90			7.89			7.89			7.90			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	0.0156			0.0137			0.0124			0.0109			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.031			0.032			0.033			0.033			EQ
Nitrate (as N)	mg/L	0.0487			0.0527			0.0566			0.0574			32.8
Nitrite (as N)	mg/L	0.0038			0.0038			0.0029			0.0029			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0031			0.0080			0.0037			0.0040			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020			
Silicate (as SiO_2)	mg/L	4.24			4.24			4.34			4.44			
Sulfate (SO_4)	mg/L	11.6			11.6			12.1			12.4			
Total Kjeldahl Nitrogen	mg/L	0.111			0.052			0.070			0.090			
Organic Carbon														
Dissolved Organic Carbon	mg/L	2.41			2.67			2.48			2.57			
Total Organic Carbon	mg/L	2.56			2.58			2.05			2.76			
Ion Balance														
Anion Sum	mEq/L	1.76			1.82			1.88			1.84			
Cation - Anion Balance	% difference	3.56			0.817			0.535			1.60			
Cation Sum	mEq/L	1.89			1.85			1.86			1.90			
Plant Pigments														
Chlorophyll-*a*	µg/L	1.96			2.40			2.00			1.89			
Dissolved Metals														
Calcium (Ca) - Dissolved	mg/L	26.8			25.9			26.0			26.7			
Magnesium (Mg) - Dissolved	mg/L	6.04			6.05			6.08			6.12			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

Secchi depth was not measured during the September sampling event.

[1] In situ measurements were collected at a depth of 5 m and laboratory samples at a depth of 3.5 m.

[2] True Colour Units.

Table 10. Field measurements, physical tests, anions, nutrients, organic carbon, and chlorophyll-*a* in water quality samples collected from the Williston and Dinosaur reservoirs in October 2022.

Date	Units	19-Oct-2022												BC Short-Term Maximum WQG
Site		W1-Shallow			W1-Deep			D1-Shallow			D1-Deep			
Total Depth (m)		133.0						42.2						
Sample Depth (m)		0.2			5.0[1]			0.2			5.0			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements														
Electrical Conductivity (in situ)	µS/cm	130.0	130.0	130.0	130.2	130.1	130.1	129.7	129.7	129.7	129.7	129.7	129.7	
Oxygen Dissolved (in situ)	mg/L	9.52	9.52	9.52	9.53	9.53	9.53	9.75	9.75	9.75	9.73	9.74	9.73	>5/>9
Oxygen Dissolved (in situ)	%	90.3	90.2	90.2	90.3	90.3	90.4	91.1	91.1	91.0	90.9	90.9	90.9	
Redox Potential (in situ)	mV	110.7	114.4	117.5	122.2	122.7	123.0	126.2	125.9	126.0	124.0	124.7	128.2	
Salinity (in situ)	ppt	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
Specific Conductivity (in situ)	µS/cm	169.1	169.1	169.1	169.1	169.1	169.1	171.4	171.4	171.4	171.4	171.4	171.4	
Temperature (in situ)	°C	12.9	12.9	12.9	12.9	12.9	12.9	12.3	12.3	12.3	12.3	12.3	12.3	
Total Dissolved Solids (in situ)	mg/L	110	110	110	110	110	110	111	111	111	111	111	111	
Turbidity (in situ)	NTU	0.94	0.93	0.98	0.88	0.92	0.90	1.27	1.27	1.26	1.31	1.34	1.34	
pH (in situ)	pH units	7.76	7.76	7.75	7.73	7.73	7.73	7.78	7.78	7.78	7.83	7.81	7.75	6.5 - 9
Physical Tests														
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	74.8			76.1			83.0			81.0			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	74.8			76.1			83.0			81.0			
Colour, True	TCU[2]	7.0			7.3			7.7			10.9			
Dissolved Hardness (as $CaCO_3$)	mg/L	92.2			89.8			92.8			90.2			
Specific Conductivity (lab)	µS/cm	159			159			163			163			
Total Dissolved Solids	mg/L	110			108			96			92			
Total Suspended Solids	mg/L	<3.0			<3.0			<3.0			<3.0			
pH (lab)	pH units	8.07			8.00			7.97			7.97			6.5 - 9
Anions and Nutrients														
Ammonia, Total (as N)	mg/L	<0.0050			<0.0050			0.0073			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.034			0.032			0.034			0.033			EQ
Nitrate (as N)	mg/L	0.0688			0.0615			0.0667			0.0654			32.8
Nitrite (as N)	mg/L	0.0017			0.0010			<0.0010			<0.0010			EQ
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0038			0.0036			0.0119			0.0039			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020			
Silicate (as SiO_2)	mg/L	4.16			4.17			4.24			4.26			
Sulfate (SO_4)	mg/L	11.9			11.6			12.0			12.0			
Total Kjeldahl Nitrogen	mg/L	0.084			0.094			0.108			0.086			
Total Nitrogen	mg/L	0.155			0.157			0.175			0.151			
Organic Carbon														
Dissolved Organic Carbon	mg/L	2.69			2.30			3.07			2.58			
Total Organic Carbon	mg/L	2.61			2.74			3.23			2.44			
Ion Balance														
Anion Sum	mEq/L	1.75			1.77			1.92			1.87			
Cation - Anion Balance	% difference	4.11			2.21			0.261			0.268			
Cation Sum	mEq/L	1.90			1.85			1.91			1.86			
Plant Pigments														
Chlorophyll-*a*	µg/L	2.56			3.08			2.58			2.60			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

Secchi depth was not recorded during the October sampling event.

[1] Windy conditions prevented equipment from sinking to the full depth of 5.0 m to measure in situ parameters.

[2] True Colour Units.

Table 11. Dissolved metals concentrations in water quality samples collected from the Williston and Dinosaur reservoirs in October 2022.

Date	Units	19-Oct-2022				BC Short-Term Maximum WQG
Site		W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	
Total Depth (m)		133.0		42.2		
Sample Depth (m)		0.2	5.0	0.2	5.0	
Replicate		A	A	A	A	
Dissolved Metals						
Aluminum (Al) - Dissolved	mg/L	0.0044	0.0047	0.0044	0.0043	
Antimony (Sb) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As) - Dissolved	mg/L	0.00019	0.00018	0.00019	0.00020	
Barium (Ba) - Dissolved	mg/L	0.0285	0.0275	0.0290	0.0292	
Beryllium (Be) - Dissolved	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	mg/L	<0.010	<0.010	<0.010	<0.010	
Cadmium (Cd) - Dissolved	mg/L	0.0000080	0.0000071	0.0000070	0.0000077	EQ
Calcium (Ca) - Dissolved	mg/L	26.6	25.9	26.8	26.1	
Cesium (Cs) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Copper (Cu) - Dissolved	mg/L	0.00060	0.00057	0.00059	0.00061	EQ
Ferrous Iron (Fe(II)) - Dissolved	mg/L	0.029	<0.020	<0.020	<0.020	
Iron (Fe) - Dissolved	mg/L	<0.010	<0.010	<0.010	<0.010	0.35
Lead (Pb) - Dissolved	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li) - Dissolved	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	
Magnesium (Mg) - Dissolved	mg/L	6.26	6.10	6.28	6.09	
Manganese (Mn) - Dissolved	mg/L	0.00021	0.00018	0.00051	0.00051	
Mercury (Hg) - Dissolved	mg/L	<0.00000050	<0.00000050	<0.00000050	<0.00000050	
Methylmercury (MeHg) - Dissolved	mg/L	<0.000000020	<0.000000020	<0.000000020	<0.000000020	
Molybdenum (Mo) - Dissolved	mg/L	0.000709	0.000708	0.000728	0.000702	
Nickel (Ni) - Dissolved	mg/L	0.00068	0.00061	0.00065	0.00062	
Phosphorus (P) - Dissolved	mg/L	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	mg/L	0.378	0.370	0.380	0.372	
Rubidium (Rb) - Dissolved	mg/L	0.00030	0.00031	0.00030	0.00031	
Selenium (Se) - Dissolved	mg/L	0.000244	0.000259	0.000281	0.000254	
Silicon (Si) - Dissolved	mg/L	2.11	2.04	2.12	2.10	
Silver (Ag) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	mg/L	1.00	0.985	1.01	1.01	
Strontium (Sr) - Dissolved	mg/L	0.106	0.101	0.104	0.102	
Sulfur (S) - Dissolved	mg/L	3.72	3.48	3.81	3.78	
Tellurium (Te) - Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	
Tungsten (W) - Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	mg/L	0.000404	0.000393	0.000404	0.000407	
Vanadium (V) - Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn) - Dissolved	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 12. Total metals concentrations in water quality samples collected from the Willison and Dinosaur reservoirs in October 2022.

Date	Units	19-Oct-2022				BC Short-Term Maximum WQG
Site		W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	
Total Depth (m)		133.0		42.2		
Sample Depth (m)		0.2	5.0	0.2	5.0	
Replicate		A	A	A	A	
Total Metals						
Aluminum (Al) - Total	mg/L	0.0166	0.0153	0.0212	0.0205	
Antimony (Sb) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As) - Total	mg/L	0.00021	0.00019	0.00022	0.00020	
Barium (Ba) - Total	mg/L	0.0291	0.0280	0.0298	0.0290	
Beryllium (Be) - Total	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Total	mg/L	<0.010	<0.010	<0.010	<0.010	1.2
Cadmium (Cd) - Total	mg/L	0.0000110	0.0000110	0.0000166	0.0000186	
Calcium (Ca) - Total	mg/L	27.8	27.6	28.2	27.8	
Cesium (Cs) - Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Total	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.11
Copper (Cu) - Total	mg/L	0.00067	0.00069	0.00077	0.00066	
Iron (Fe) - Total	mg/L	0.014	0.014	0.023	0.023	1
Lead (Pb) - Total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	EQ
Lithium (Li) - Total	mg/L	0.0013	0.0013	0.0014	0.0013	
Magnesium (Mg) - Total	mg/L	6.08	6.20	6.29	6.02	
Manganese (Mn) - Total	mg/L	0.00132	0.00127	0.00188	0.00206	EQ
Mercury (Hg) - Total	mg/L	0.00000051	<0.00000050	<0.00000050	0.00000052	
Methylmercury (MeHg) - Total	mg/L	<0.00000002	<0.00000002	<0.00000002	<0.00000002	
Molybdenum (Mo) - Total	mg/L	0.000808	0.000767	0.000765	0.000717	46
Nickel (Ni) - Total	mg/L	0.00072	0.00069	0.00075	0.00072	
Phosphorus (P) - Total	mg/L	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Total	mg/L	0.435	0.443	0.442	0.436	
Rubidium (Rb) - Total	mg/L	0.00034	0.00029	0.00030	0.00029	
Selenium (Se) - Total	mg/L	0.000241	0.000241	0.000211	0.000251	
Silicon (Si) - Total	mg/L	2.07	2.06	2.15	2.10	
Silver (Ag) - Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	EQ
Sodium (Na) - Total	mg/L	1.01	1.02	1.04	1.01	
Strontium (Sr) - Total	mg/L	0.106	0.104	0.109	0.106	
Sulfur (S) - Total	mg/L	4.67	4.54	4.71	4.73	
Tellurium (Te) - Total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	mg/L	0.00046	<0.00030	0.00066	0.00048	
Tungsten (W) - Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	mg/L	0.000412	0.000401	0.000420	0.000400	
Vanadium (V) - Total	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn) - Total	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	EQ
Zirconium (Zr) - Total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

Table 13. Field measurements, physical tests, anions, nutrients, and organic carbon in water quality samples collected from the Site C Reservoir Reach of the Peace River in early June 2022.

Date	Units	02-Jun-2022												03-Jun-2022						BC Short-Term Maximum WQG
Site		PC1			PR1			PR2			HD			PR3			MD			
Total Depth (m)		0.7			0.6			2.6			4.3			1.4			0.7			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																				
Electrical Conductivity (in situ)	µS/cm	111.6	111.3	112	113	112.9	112.9	118.7	119.4	119.1	233.5	233.2	233.8	153.4	152.0	152.5	169.8	169.5	169.9	
Oxygen Dissolved (in situ)	mg/L	11.99	11.99	11.99	12.05	12.05	12.05	11.7	11.69	11.7	10.08	10.08	10.08	-	10.78	10.77	9.22	9.23	9.23	>5/>9
Redox Potential (in situ)	mV	120.2	120.3	120.5	93	93.8	94.6	123.5	125.8	125.6	136	135.7	135.3	129.3	129.5	130.0	150.7	150.3	148.9	
Salinity (in situ)	ppt	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.15	0.15	0.15	0.10	0.10	0.10	0.1	0.1	0.1	
Specific Conductivity (in situ)	µS/cm	178.6	178	179.1	180.6	180.5	180.6	184.9	185.6	185.2	308.4	308.1	308.7	216.3	214.2	214.8	211.3	211.1	211.3	
Temperature (in situ)	°C	5.4	5.4	5.4	5.4	5.4	5.4	6.3	6.3	6.3	12.3	12.3	12.3	9.8	9.8	9.8	14.7	14.7	14.8	
Total Dissolved Solids (in situ)	mg/L	116	116	116	117	117	117	120	121	120	200	200	201	141	139	140	137	137	137	
Turbidity (in situ)	NTU	35.07	36.29	37.47	36.09	35.98	36.19	82.69	78.68	80.25	163.29	159.46	170.78	111.23	112.7	111.94	561.19	572.35	565.71	
pH (in situ)	pH units	7.87	7.88	7.87	7.84	7.84	7.83	7.98	7.95	7.69	8.11	8.11	8.12	8.00	8.00	8.00	7.9	7.9	7.8	6.5 - 9
Physical Tests																				
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	80.2	79.0		80.9	80.3		83.0			140			105			105			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0	<1.0		<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0	<1.0		<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	80.2	79.0		80.9	80.3		83.0			140			105			105			
Colour, True	TCU[1]	15.1	14.6		15.9	15.8		20.3			37.7			24.2			38.8			
Dissolved Hardness (as $CaCO_3$)	mg/L	98.0	95.2		97.4	96.6		94.6			172			123			111			
Specific Conductivity (lab)	µS/cm	185	186		187	186		193			319			235			218			
Total Dissolved Solids	mg/L	132	125		129	125		160			263			208			241			
Total Suspended Solids	mg/L	24.3	16.5		17.5	21.3		65.1			289			130			1,200			
pH (lab)	pH units	7.90	7.95		7.99	7.99		8.00			8.27			8.09			8.01			6.5 - 9
Anions and Nutrients																				
Ammonia, Total (as N)	mg/L	<0.0050	<0.0050		<0.0050	<0.0050		0.0062			0.0138			0.0080			0.0304			EQ
Chloride (Total)	mg/L	<0.50	<0.50		<0.50	<0.50		<0.50			0.83			<0.50			<0.50			600
Fluoride (F)	mg/L	0.046	0.040		0.041	0.040		0.045			0.093			0.063			0.086			EQ
Nitrate (as N)	mg/L	0.0837	0.0899		0.0844	0.0873		0.0865			0.0316			0.0715			0.0719			32.8
Nitrite (as N)	mg/L	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010			<0.0010			<0.0010			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	0.0022	0.0020		0.0022	0.0022		0.0033			0.0066			0.0043			0.0053			
Phosphorus (P) - Total	mg/L	0.0398	0.0466		0.0415	0.0405		0.117			0.300			0.170			1.25			
Phosphorus (P) - Total Dissolved	mg/L	0.0036	0.0033		0.0031	0.0035		0.0043			0.0095			0.0058			0.0088			
Sulfate (SO_4)	mg/L	14.5	14.5		14.4	14.4		15.5			32.6			21.4			13.2			
Total Kjeldahl Nitrogen	mg/L	0.088	0.084		0.088	0.091		0.166			0.319			0.204			0.840			
Total Nitrogen	mg/L	0.172	0.174		0.172	0.178		0.252			0.351			0.276			0.912			
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	3.43	3.58		3.59	3.79		4.76			8.58			6.13			9.05			
Total Organic Carbon	mg/L	3.73	3.87		3.83	3.74		6.42			8.71			7.86			24.0			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

Dissolved oxygen saturation (Oxygen Dissolved (in situ) (%)) was not recorded during the early June sampling event.

Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the early June sampling event. These parameters were not requested as part of the RFQ and were added to the analysis during subsequent sampling events in 2022.

All samples were collected at a depth of 0.2 m.

Black dashes (-) indicate that no data were collected.

[1]True Colour Units.

Table 14. Dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in early June 2022.

Date	02-Jun-2022						03-Jun-2022		BC Short-Term Maximum WQG
Site	PC1		PR1		PR2	HD	PR3	MD	
Total Depth (m)	0.7		0.6		2.6	4.3	1.4	0.7	
Replicate	A	B	A	B	A	A	A	A	
Dissolved Metals (mg/L)									
Aluminum (Al) - Dissolved	0.0263	0.0298	0.0232	0.0305	0.0315	0.0298	0.0230	0.0192	
Antimony (Sb) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00018	0.00012	0.00015	
Arsenic (As) - Dissolved	0.00020	0.00020	0.00019	0.00019	0.00021	0.00028	0.00021	0.00040	
Barium (Ba) - Dissolved	0.0409	0.0425	0.0440	0.0443	0.0414	0.0646	0.0513	0.0829	
Beryllium (Be) - Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	
Cadmium (Cd) - Dissolved	0.0000124	0.0000129	0.0000119	0.0000114	0.0000143	0.0000226	0.0000162	0.0000150	EQ
Calcium (Ca) - Dissolved	28.8	27.7	28.4	28.2	26.7	47.6	34.6	30.5	
Cesium (Cs) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00017	0.00012	0.00017	
Copper (Cu) - Dissolved	0.00074	0.00075	0.00078	0.00082	0.00094	0.00134	0.00118	0.00148	EQ
Iron (Fe) - Dissolved	0.040	0.041	0.032	0.037	0.044	0.064	0.039	0.047	0.35
Lead (Pb) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000054	
Lithium (Li) - Dissolved	0.0015	0.0015	0.0015	0.0015	0.0018	0.0054	0.0033	0.0040	
Magnesium (Mg) - Dissolved	6.34	6.32	6.44	6.37	6.78	12.8	8.83	8.48	
Manganese (Mn) - Dissolved	0.00320	0.00325	0.00299	0.00284	0.00430	0.00692	0.00584	0.0131	
Mercury (Hg) - Dissolved	0.00000113	0.00000097	0.00000102	0.00000094	0.00000108	0.00000144	0.00000153	0.00000152	
Methylmercury (MeHg) - Dissolved	<0.000000020	0.000000022	<0.000000020	<0.000000020	0.000000034	0.000000034	<0.000000020	<0.000000020	
Molybdenum (Mo) - Dissolved	0.000706	0.000712	0.000722	0.000719	0.000683	0.00251	0.00129	0.000615	
Nickel (Ni) - Dissolved	0.00118	0.00103	0.00106	0.00109	0.00114	0.00234	0.00154	0.00202	
Phosphorus (P) - Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	0.480	0.486	0.487	0.487	0.590	0.724	0.651	1.17	
Rubidium (Rb) - Dissolved	0.00025	0.00032	0.00032	0.00035	0.00031	0.00037	0.00030	0.00035	
Selenium (Se) - Dissolved	0.000335	0.000246	0.000220	0.000290	0.000315	0.00114	0.000530	0.000240	
Silicon (Si) - Dissolved	2.25	2.24	2.22	2.27	2.17	1.91	2.24	1.70	
Silver (Ag) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	1.21	1.22	1.24	1.21	1.31	2.59	2.00	2.00	
Strontium (Sr) - Dissolved	0.116	0.112	0.112	0.113	0.0955	0.220	0.140	0.0844	
Sulfur (S) - Dissolved	4.97	5.40	5.22	4.63	4.99	12.2	6.97	4.55	
Tellurium (Te) - Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	0.00072	0.00088	0.00048	0.00072	0.00096	0.00118	0.00064	0.00032	
Tungsten (W) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	0.000506	0.000509	0.000502	0.000499	0.000493	0.000666	0.000535	0.000461	
Vanadium (V) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00053	<0.00050	
Zinc (Zn) - Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

All samples were collected at a depth of 0.2 m.

[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 15. Total metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in early June 2022.

Date	02-Jun-2022						03-Jun-2022		BC Short-Term Maximum WQG
Site	PC1		PR1		PR2	HD	PR3	MD	
Total Depth (m)	0.7		0.6		2.6	4.3	1.4	0.7	
Replicate	A	B	A	B	A	A	A	A	
Total Metals (mg/L)									
Aluminum (Al) - Total	0.766	0.833	0.735	0.750	2.73	3.22	2.31	9.73	
Antimony (Sb) - Total	0.00011	0.00011	0.00010	0.00011	0.00023	0.00039	0.00026	0.00048	
Arsenic (As) - Total	0.00075	0.00066	0.00064	0.00064	0.00176	0.00303	0.00208	0.00816	
Barium (Ba) - Total	0.0783	0.0792	0.0803	0.0771	0.117	0.239	0.143	0.610	
Beryllium (Be) - Total	0.000054	0.000048	0.000057	0.000048	0.000147	0.000242	0.000147	0.000786	
Bismuth (Bi) - Total	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000063	<0.000050	0.000146	
Boron (B) - Total	<0.010	<0.010	<0.010	<0.010	<0.010	0.016	<0.010	0.018	1.2
Cadmium (Cd) - Total	0.0000541	0.0000598	0.0000565	0.0000516	0.000169	0.000439	0.000244	0.00106	
Calcium (Ca) - Total	27.1	27.8	28.2	28.0	30.5	55.6	36.6	58.3	
Cesium (Cs) - Total	0.000209	0.000216	0.000202	0.000212	0.000569	0.000966	0.000578	0.00192	
Chromium (Cr) - Total	0.00135	0.00139	0.00122	0.00117	0.00478	0.00575	0.00405	0.0171	
Cobalt (Co) - Total	0.00049	0.00050	0.00048	0.00050	0.00151	0.00282	0.00186	0.0107	0.11
Copper (Cu) - Total	0.00209	0.00212	0.00203	0.00205	0.00497	0.00895	0.00608	0.0298	
Iron (Fe) - Total	1.31	1.30	1.30	1.33	3.80	6.47	4.30	21.7	1
Lead (Pb) - Total	0.000713	0.000725	0.000711	0.000734	0.00183	0.00398	0.00227	0.0134	EQ
Lithium (Li) - Total	0.0021	0.0022	0.0022	0.0021	0.0044	0.0093	0.0051	0.0183	
Magnesium (Mg) - Total	6.21	6.26	6.14	6.04	7.77	13.8	10.5	16.4	
Manganese (Mn) - Total	0.0176	0.0174	0.0175	0.0175	0.0541	0.101	0.0694	0.462	EQ
Mercury (Hg) - Total	0.00000288	0.00000331	0.00000295	0.00000290	0.00000433	0.00000388	0.0000155	0.0000709	
Methylmercury (MeHg) - Total	0.000000031	0.000000040	0.000000022	0.000000024	0.000000023	0.000000035	<0.00000020	0.000000328	
Molybdenum (Mo) - Total	0.000795	0.000784	0.000731	0.000810	0.000982	0.00257	0.00133	0.00102	46
Nickel (Ni) - Total	0.00245	0.00243	0.00238	0.00248	0.00632	0.0116	0.00773	0.0367	
Phosphorus (P) - Total	<0.050	<0.050	<0.050	<0.050	0.113	0.256	0.212	1.06	
Potassium (K) - Total	0.793	0.819	0.775	0.788	1.57	1.61	1.41	3.30	
Rubidium (Rb) - Total	0.00265	0.00275	0.00242	0.00242	0.00643	0.00806	0.00587	0.0187	
Selenium (Se) - Total	0.000212	0.000359	0.000272	0.000272	0.000454	0.00118	0.000761	0.000732	
Silicon (Si) - Total	3.01	3.28	2.98	3.00	7.05	5.84	5.64	16.3	
Silver (Ag) - Total	0.000019	0.000020	0.000018	0.000020	0.000044	0.000091	0.000046	0.000182	EQ
Sodium (Na) - Total	1.25	1.23	1.20	1.18	1.36	2.49	2.03	2.19	
Strontium (Sr) - Total	0.111	0.112	0.109	0.109	0.111	0.242	0.154	0.161	
Sulfur (S) - Total	5.42	5.49	5.21	5.19	5.05	10.5	7.90	5.29	
Tellurium (Te) - Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	0.000026	0.000026	0.000024	0.000025	0.000067	0.000136	0.000078	0.000242	
Thorium (Th) - Total	0.00016	0.00018	0.00016	0.00019	0.00062	0.00096	0.00063	0.00282	
Tin (Sn) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	0.00784	0.0108	0.00617	0.00604	0.0668	0.0253	0.0242	0.0538	
Tungsten (W) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	0.000531	0.000534	0.000515	0.000515	0.000657	0.00102	0.000700	0.00132	
Vanadium (V) - Total	0.00303	0.00330	0.00292	0.00297	0.0105	0.0142	0.0101	0.0362	
Zinc (Zn) - Total	0.0069	0.0080	0.0077	0.0070	0.0186	0.0386	0.0240	0.111	EQ
Zirconium (Zr) - Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00060	0.00029	<0.00020	<0.00020	

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
All samples were collected at a depth of 0.2 m.

Table 16. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in late June 2022.

Date	Units	28-Jun-2022												27-Jun-2022			BC Short-Term Maximum WQG
Site		PR1			PR2			HD			PR3			MD			
Total Depth (m)		9.4			2.3			3.2			3.3			0.4			
Sample Depth (m)		0.2			0.2			0.2			0.2			0.4			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																	
Electrical Conductivity (in situ)	µS/cm	127.2	127.3	127.3	135.3	135.5	135.5	247.1	247.1	246.9	151.0	150.9	149.9	160.3	160.3	160.3	
Oxygen Dissolved (in situ)	mg/L	11.65	11.65	11.66	10.99	10.99	11.0	9.88	9.88	9.88	10.74	10.74	10.75	9.12	9.11	9.11	>5/>9
Oxygen Dissolved (in situ)	%	100	100	100.1	97.2	97.2	97.3	94.8	94.7	94.7	95.9	95.8	95.9	94.3	94.3	94.3	
Redox Potential (in situ)	mV	114.1	116.7	118.2	215	213.2	212.7	177.1	177.6	177.6	161.3	161.0	159.5	169.9	169.6	169.6	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.15	0.15	0.15	0.1	0.1	0.1	0.09	0.09	0.09	
Specific Conductivity (in situ)	µS/cm	185	185.1	185	190.2	190.3	190.3	317.3	317.3	317.2	210.0	210.0	208.4	189.3	189.3	189.3	
Temperature (in situ)	°C	8.7	8.7	8.7	9.9	9.9	9.9	13.4	13.4	13.4	10.3	10.3	10.3	17	17	17	
Total Dissolved Solids (in situ)	mg/L	120	120	110	124	124	124	206	206	206	135	136	136	123	123	123	
Turbidity (in situ)	NTU	9.41	10.13	9.68	18.69	18.77	18.84	102.68	106.72	107.11	56.3	55.0	55.75	457.40	458.97	457.62	
pH (in situ)	pH units	7.95	7.94	7.93	7.93	7.93	7.93	8.17	8.16	8.17	7.97	7.97	8.00	7.91	7.91	7.9	6.5 - 9
Physical Tests																	
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	92.6			89.8			148	151		97.7			112			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			3.6	3.0		<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0	<1.0		<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	92.6			89.8			152	154		97.7			112			
Dissolved Hardness (as $CaCO_3$)	mg/L	94.8			96.9			169	168		108			99.8			
Specific Conductivity (lab)	µS/cm	190			194			320	322		215			186			
Total Dissolved Solids	mg/L	127			137			243	244		164			226			
Total Suspended Solids	mg/L	5.9			17.1			148	147		121			915			
pH (lab)	pH units	8.10			8.11			8.33	8.32		8.16			8.04			6.5 - 9
Anions and Nutrients																	
Ammonia, Total (as N)	mg/L	0.0094			0.0070			0.0076	0.0233		0.0051			0.0191			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50	<0.50		<0.50			<0.50			600
Fluoride (F)	mg/L	0.032			0.033			0.064	0.062		0.039			0.056			EQ
Nitrate (as N)	mg/L	0.0732			0.0651			0.0166	0.0160		0.0609			0.0241			32.8
Nitrite (as N)	mg/L	0.0010			0.0012			0.0012	0.0010		<0.0010			0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			0.0025	0.0024		<0.0010			0.0018			
Phosphorus (P) - Total	mg/L	0.0132			0.0283			0.199	0.193		0.136			1.02			
Phosphorus (P) - Total Dissolved	mg/L	0.0029			0.0029			0.0069	0.0068		0.0046			0.0080			
Silicate (as SiO_2)	mg/L	4.68			4.73			3.71	3.71		4.53			3.46			
Sulfate (SO_4)	mg/L	12.8			13.4			29.2	29.1		15.8			8.26			
Total Kjeldahl Nitrogen	mg/L	0.155			0.157			0.498	0.455		0.320			1.52			
Total Nitrogen	mg/L	0.229			0.223			0.516	0.472		0.381			1.54			
Organic / Inorganic Carbon																	
Dissolved Organic Carbon	mg/L	3.22			3.34			5.17	5.29		3.63			8.82			
Total Organic Carbon	mg/L	2.96			3.62			6.67	6.75		3.73			8.87			
Ion Balance																	
Anion Sum	mEq/L	2.12			2.08			3.65	3.69		2.29			2.41			
Cation - Anion Balance	% difference	3.92			1.71			2.24	3.22		0.881			6.87			
Cation Sum	mEq/L	1.96			2.01			3.49	3.46		2.25			2.10			
Dissolved Metals																	
Calcium (Ca) - Dissolved	mg/L	27.0			27.4			45.6	45.6		30.3			26.5			
Magnesium (Mg) - Dissolved	mg/L	6.66			6.92			13.5	13.2		7.98			8.17			
Phosphorus (P) - Dissolved	mg/L	<0.050			<0.050			<0.050	<0.050		<0.050			-			
Potassium (K) - Dissolved	mg/L	-			-			-	-		-			0.857			
Sodium (Na) - Dissolved	mg/L	1.25			1.41			1.96	1.92		1.48			1.80			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
Black dashes (-) indicate that no data were collected.

Table 17. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in July 2022.

Date	Units	26-Jul-2022																25-Jul-2022			BC Short-Term Maximum WQG
Site		PC1			PR1			PR2			HD			PR3			MD			
Total Depth (m)		4.5			10.8			3.5			2.3			1.8			0.2			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																					
Electrical Conductivity (in situ)	µS/cm	134.2	134.5	134.4	134.6	134.7	134.6	142.5	143.0	143.0	373.2	373.0	373.0	152.8	152.8	153.0	198.0	198.1	198.2	
Oxygen Dissolved (in situ)	mg/L	10.92	10.94	10.87	11.03	11.04	11.04	10.9	10.9	10.91	8.82	8.81	8.81	10.4	10.4	10.4	8.47	8.47	8.46	>5/>9
Oxygen Dissolved (in situ)	%	98.3	98.6	98.0	99.5	99.6	99.6	102.8	102.9	102.9	98.0	97.8	97.8	98.3	98.3	98.3	95.9	95.9	96.0	
Redox Potential (in situ)	mV	137.7	138.4	139.4	136.5	137.2	137.5	171.6	170.8	170.1	141.3	139.9	140.8	125.8	126.5	127.5	132.1	132.6	138.5	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.20	0.20	0.20	0.09	0.09	0.09	0.10	0.10	0.10	
Specific Conductivity (in situ)	µS/cm	184.6	185.0	184.9	184.9	184.9	184.9	186.3	186.9	186.8	408.8	408.8	408.8	199.3	199.4	199.6	212.3	212.3	212.3	
Temperature (in situ)	°C	10.7	10.7	10.7	10.8	10.8	10.8	12.7	12.7	12.7	20.4	20.4	20.4	12.8	12.8	12.8	21.5	21.5	21.5	
Total Dissolved Solids (in situ)	mg/L	120	120	120	120	120	120	121	121	121	266	266	266	129	129	129	138	138	138	
Turbidity (in situ)	NTU	0.37	0.32	2.18	0.5	0.52	0.36	2.30	2.27	2.16	17.79	17.70	17.75	7.09	6.86	6.53	59.42	57.95	57.60	
pH (in situ)	pH units	7.79	7.79	7.78	7.71	7.71	7.71	8.07	8.08	8.08	8.35	8.37	8.35	7.99	7.98	7.98	8.19	8.18	8.19	6.5 - 9
Physical Tests																					
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	105			96.8			98.0			203			105			126			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	105			96.8			98.0			203			105			126			
Colour, True	TCU[1]	6.7			6.3			6.9			5.9			6.6						
Dissolved Hardness (as $CaCO_3$)	mg/L	90.8			90.5			91.7			212			98.1			106			
Specific Conductivity (lab)	µS/cm	186			186			186			398			199			208			
Total Dissolved Solids	mg/L	110			120			120			236			124			176			
Total Suspended Solids	mg/L	<3.0			<3.0			7.1			15.7			16.5			60.2			
pH (lab)	pH units	7.23			7.26			7.24			7.86			7.28			7.29			6.5 - 9
Anions and Nutrients																					
Ammonia, Total (as N)	mg/L	0.0068			0.0057			<0.0050			<0.0050			<0.0050			0.0334			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.034			0.035			0.035			0.091			0.039			0.073			EQ
Nitrate (as N)	mg/L	0.0694			0.0700			0.0672			0.0103			0.0691			0.0064			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			<0.0010						
Phosphorus (P) - Total	mg/L	0.0032			0.0036			0.0088			0.0304			0.0355			0.0957			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020			<0.0020			0.0030			
Silicate (as SiO_2)	mg/L	4.53			4.50			4.44			3.78			4.46			3.30			
Sulfate (SO_4)	mg/L	14.1			14.2			14.5			46.1			16.4			9.23			
Total Kjeldahl Nitrogen	mg/L	0.100			0.074			0.089			0.130			0.130			0.376			
Total Nitrogen	mg/L	0.169			0.144			0.156			0.140			0.199			0.382			
Organic / Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	2.55			2.94			2.49			2.27			2.74			8.28			
Total Organic Carbon	mg/L	2.62			2.54			2.62			2.19			2.69			6.93			
Dissolved Metals																					
Calcium (Ca) - Dissolved	mg/L	26.1			26.0			26.3			57.4			27.9			28.8			
Magnesium (Mg) - Dissolved	mg/L	6.22			6.22			6.33			16.6			6.90			8.26			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the July sampling event; these parameters were not requested as part of the RFQ.
All samples were collected at a depth of 0.2 m.
[1]True Colour Units.

Table 18. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in August 2022.

Date	Units	17-Aug-2022						18-Aug-2022									22-Aug-2022			BC Short-Term Maximum WQG
Site		PC1			PR1			PR2			HD			PR3			MD			
Total Depth (m)		2.1			5.6			3.6			1.4			4.4			0.2			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																				
Electrical Conductivity (in situ)	µS/cm	142.2	142.2	142.2	141.4	141.6	142.1	147.9	147.8	147.1	408.4	408.6	408.7	149.4	149.1	149.4	282.3	282.4	282.4	
Oxygen Dissolved (in situ)	mg/L	10.21	10.21	10.19	10.28	10.28	10.28	10.4	10.4	10.4	8.75	8.75	8.75	9.97	9.97	9.97	8.13	8.12	8.12	>5/>9
Oxygen Dissolved (in situ)	%	94.3	94.2	94.0	94.8	94.8	94.8	99.1	99.1	99.1	97.6	97.6	97.7	93.7	93.7	93.7	96.5	96.5	96.5	
Redox Potential (in situ)	mV	134.4	134.4	135.1	139.5	139.7	139.8	104.1	104.5	105	101.4	104.7	105.4	119.6	119	119	113.3	116.9	117.6	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.21	0.21	0.21	0.09	0.09	0.09	0.14	0.14	0.14	
Specific Conductivity (in situ)	µS/cm	190.5	190.5	190.6	189.6	189.8	190.5	191.3	191.1	190.1	445.3	445.3	445.3	196.1	195.7	196.1	288.1	288.1	288.1	
Temperature (in situ)	°C	11.7	11.7	11.7	11.7	11.7	11.7	13.1	13.1	13.1	20.7	20.7	20.7	12.5	12.5	12.5	23.9	24.0	24.0	
Total Dissolved Solids (in situ)	mg/L	124	124	124	123	123	124	124	124	124	289	289	289	127	127	127	187	187	187	
Turbidity (in situ)	NTU	0.55	0.57	0.59	0.61	0.71	0.65	2.51	2.52	2.50	19.98	23.12	22.41	3.52	3.44	3.40	10.01	10.16	10.02	
pH (in situ)	pH units	7.76	7.76	7.75	7.75	7.75	7.74	7.90	7.90	7.90	8.31	8.26	8.25	7.72	7.72	7.73	8.23	8.22	8.22	6.5 - 9
Physical Tests																				
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	82.1			82.5			78.2	79.0		171			82.4			128			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0	<1.0		10.2			<1.0			5.4			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0	<1.0		<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	82.1			82.5			78.2	79.0		182			82.4			134			
Colour, True	TCU[1]	6.6			6.9			5.9	5.5		5.5			6.0			13.5			
Dissolved Hardness (as $CaCO_3$)	mg/L	90.2			93.7			95.6	97.6		225			97.7			143			
Specific Conductivity (lab)	µS/cm	177			177			185	184		421			187			260			
Total Dissolved Solids	mg/L	127			117			125	130		300			131			174			
Total Suspended Solids	mg/L	<3.0			<3.0			12.0	<3.0		<3.0			12.4			<3.0			
pH (lab)	pH units	8.10			8.10			8.07	8.09		8.43			8.07			8.34			6.5 - 9
Anions and Nutrients																				
Ammonia, Total (as N)	mg/L	0.0160			0.0146			<0.0050	0.0055		<0.0050			0.0102			0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50	<0.50		<0.50			<0.50			<0.50			600
Fluoride (F)	mg/L	0.040			0.040			0.040	0.041		0.107			0.041			0.085			EQ
Nitrate (as N)	mg/L	0.0697			0.0733			0.0647	0.0640		<0.0050			0.0648			<0.0050			32.8
Nitrite (as N)	mg/L	0.0030			0.0030			0.0023	0.0023		<0.0010			0.0019			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010	<0.0010		0.0013			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0035			0.0039			0.0108	0.0116		0.0320			0.0095			0.0150			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020	<0.0020		<0.0020			<0.0020			0.0023			
Silicate (as SiO_2)	mg/L	4.51			4.51			4.38	4.38		3.86			4.38			3.08			
Sulfate (SO_4)	mg/L	13.1			13.1			13.2	13.2		50.0			13.8			12.2			
Total Kjeldahl Nitrogen	mg/L	0.088			0.090			0.074	0.083		0.106			0.074			0.157			
Total Nitrogen	mg/L	0.182			0.174			0.141	0.140		0.081			0.141			0.158			
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	2.90			2.58			2.55	2.48		2.80			2.43			5.40			
Total Organic Carbon	mg/L	3.01			2.72			2.69	2.97		2.71			2.84			5.51			
Ion Balance																				
Anion Sum	mEq/L	1.92			1.93			1.84	1.86		4.68			1.94			2.94			
Cation - Anion Balance	% difference	1.59			<0.010			3.41	3.88		0.429			1.77			1.51			
Cation Sum	mEq/L	1.86			1.93			1.97	2.01		4.64			2.01			3.03			
Dissolved Metals																				
Calcium (Ca) - Dissolved	mg/L	25.9			27.3			27.8	28.2		61.7			28.0			40.2			
Magnesium (Mg) - Dissolved	mg/L	6.20			6.20			6.36	6.60		17.3			6.74			10.4			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
All samples were collected at a depth of 0.2 m.
[1]True Colour Units.

Table 19. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in September 2022.

Date	Units	21-Sep-2022												20-Sep-2022						BC Short-Term Maximum WQG
Site		PC1			PR1			PR2			HD			PR3			MD			
Total Depth (m)		2.3			8.2			3.1			0.4			4.2			0.8			
Sample Depth (m)		0.2			0.2			0.2			0.2			0.2			0.8			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																				
Electrical Conductivity (in situ)	µS/cm	141.2	141.2	141.2	141.0	141.0	141.0	141.0	140.2	139.8	329.2	329.2	329.4	145.2	145.2	145.0	256.2	256.3	256.3	
Oxygen Dissolved (in situ)	mg/L	9.92	9.92	9.92	9.94	9.94	9.95	9.99	9.98	9.99	10.91	10.92	10.92	9.81	9.81	9.81	11.05	11.06	11.06	>5/>9
Oxygen Dissolved (in situ)	%	93.1	93.1	93.1	93.3	93.3	93.3	93.4	93.3	93.4	95.8	95.8	95.9	92.6	92.6	92.7	95.1	95.1	95.1	
Redox Potential (in situ)	mV	121.4	122.0	122.9	126.8	127.6	128.6	130.8	131.6	132.2	140.4	140.5	140.8	107.8	109.5	109.5	81.5	82.6	83.0	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.23	0.23	0.23	0.09	0.09	0.09	0.18	0.18	0.18	
Specific Conductivity (in situ)	µS/cm	185.7	185.7	185.7	185.4	185.4	185.5	186.1	184.9	184.5	467.1	467.0	467.1	189.6	189.5	189.3	371.9	371.9	371.9	
Temperature (in situ)	°C	12.5	12.5	12.5	12.5	12.5	12.5	12.3	12.3	12.3	9.5	9.5	9.6	12.7	12.7	12.8	8.7	8.7	8.7	
Total Dissolved Solids (in situ)	mg/L	121	121	121	121	121	121	121	120	120	304	304	304	123	123	123	242	242	242	
Turbidity (in situ)	NTU	0.62	0.61	0.57	0.59	0.57	0.60	2.39	1.50	1.71	6.02	6.13	6.01	1.05	1.00	1.02	2.21	2.26	2.33	
pH (in situ)	pH units	7.77	7.77	7.78	7.78	7.78	7.78	7.77	7.77	7.77	8.13	8.13	8.12	7.86	7.84	7.85	8.11	8.11	8.11	6.5 - 9
Physical Tests																				
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	81.6			80.8			81.6			181	179		84.1	86.5		166			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			15.6	15.8		<1.0	<1.0		6.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0	<1.0		<1.0	<1.0		<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	81.6			80.8			81.6			197	195		84.1	86.5		172			
Colour, True	TCU[1]	6.8			6.3			6.4			<5.0	<5.0		6.6	7.0		5.3			
Dissolved Hardness (as $CaCO_3$)	mg/L	89.4			89.0			89.8			243	240		87.4	86.9		174			
Specific Conductivity (lab)	µS/cm	173			169			170			427	424		175	175		339			
Total Dissolved Solids	mg/L	121			112			118			268	270		97	110		192			
Total Suspended Solids	mg/L	<3.0			<3.0			<3.0			<3.0	<3.0		<3.0	<3.0		<3.0			
pH (lab)	pH units	7.99			8.03			8.05			8.48	8.48		7.99	7.99		8.34			6.5 - 9
Anions and Nutrients																				
Ammonia, Total (as N)	mg/L	0.0097			0.0087			<0.0050			<0.0050	<0.0050		<0.0050	<0.0050		<0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50	<0.50		<0.50	<0.50		0.54			600
Fluoride (F)	mg/L	0.034			0.032			0.032			0.093	0.095		0.033	0.033		0.086			EQ
Nitrate (as N)	mg/L	0.0641			0.0607			0.0583			<0.0050	<0.0050		0.0561	0.0566		<0.0050			32.8
Nitrite (as N)	mg/L	0.0024			0.0021			0.0015			<0.0010	<0.0010		0.0017	0.0018		<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	0.0013			0.0013			0.0010			0.0011	<0.0010		<0.0010	<0.0010		<0.0010			
Phosphorus (P) - Total	mg/L	0.0041			0.0046			0.0053			0.0104	0.0094		0.0050	0.0046		0.0048			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020	<0.0020		<0.0020	<0.0020		<0.0020			
Silicate (as SiO_2)	mg/L	4.34			4.35			4.16			3.46	3.44		4.11	4.11		3.81			
Sulfate (SO_4)	mg/L	12.2			12.1			12.3			52.5	54.0		12.8	12.8		21.4			
Total Kjeldahl Nitrogen	mg/L	0.094			0.189			0.104			0.102	0.080		0.092	0.129		0.146			
Total Nitrogen	mg/L	0.160			0.252			0.164			0.102	0.080		0.150	0.187		0.146			
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	3.12			3.02			3.20			3.44	2.79		3.29	3.19		3.93			
Total Organic Carbon	mg/L	2.90			3.09			2.73			3.43	2.99		3.14	3.07		3.51			
Ion Balance																				
Anion Sum	mEq/L	1.89			1.87			1.89			5.03	5.03		1.95	2.00		3.90			
Cation - Anion Balance	% difference	-1.34			-0.81			1.07			0.299	0.903		4.00	5.54		2.09			
Cation Sum	mEq/L	1.84			1.84			1.85			5.00	4.94		1.80	1.79		3.74			
Dissolved Metals																				
Calcium (Ca) - Dissolved	mg/L	25.7			25.6			25.8			65.0	64.5		25.2	25.1		48.1			
Magnesium (Mg) - Dissolved	mg/L	6.12			6.08			6.17			19.5	19.1		5.95	5.89		13.2			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
[1]True Colour Units.

Table 20. Field measurements, physical tests, anions, nutrients, and organic carbon in water quality samples collected from the Site C Reservoir Reach of the Peace River in October 2022.

Date	Units	21-Oct-2022												18-Oct-2022						BC Short-Term Maximum WQG
Site		PC1			PR1			PR2			HD			PR3			MD			
Total Depth (m)		2.2			9.7			3.9			0.5			4.2			0.2			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																				
Electrical Conductivity (in situ)	µS/cm	128.9	128.8	128.6	128.7	128.5	128.6	128.9	126.7	127.5	297.3	297.2	297.3	130.1	130.0	130.0	275.0	275.2	275.2	
Oxygen Dissolved (in situ)	mg/L	9.88	9.88	9.88	9.88	9.88	9.88	10.21	10.2	10.2	11.76	11.76	11.76	9.93	9.93	9.93	11.8	11.81	11.81	>5/>9
Oxygen Dissolved (in situ)	%	91.8	91.4	91.4	91.3	91.3	91.3	93.9	93.8	93.9	95.9	95.9	95.9	91.6	91.6	91.6	96.6	96.7	96.7	
Redox Potential (in situ)	mV	110.1	109.9	109.1	82.1	84.6	87.8	107.6	107.7	108.5	107.5	107.3	107.3	153.2	114.7	133.4	148.0	148.7	149.1	
Salinity (in situ)	ppt	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.22	0.22	0.22	0.08	0.08	0.08	0.2	0.20	0.20	
Specific Conductivity (in situ)	µS/cm	172.1	172.1	171.8	172.0	171.7	171.9	173.3	170.1	171.3	459.1	459.1	459.1	174.3	174.2	174.3	422.9	422.9	422.9	
Temperature (in situ)	°C	11.8	11.8	11.8	11.8	11.8	11.8	11.6	11.6	11.6	6.5	6.5	6.6	11.7	11.7	11.7	6.7	6.7	6.7	
Total Dissolved Solids (in situ)	mg/L	112	112	112	112	112	112	113	112	112	298	298	298	113	113	113	275	275	275	
Turbidity (in situ)	NTU	1.30	1.30	1.27	1.35	1.41	1.39	4.11	2.71	10.82	6.24	5.86	5.94	2.43	2.56	2.55	1.56	1.59	1.60	
pH (in situ)	pH units	8.16	8.14	8.14	8.16	8.15	8.12	8.32	8.27	8.23	8.61	8.59	8.53	7.64	7.64	7.61	8.06	8.05	8.04	6.5 - 9
Physical Tests																				
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	71.0			71.4			71.0			178			74.7			188			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			8.8			<1.0			15.6			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	71.0			71.4			71.0			186			74.7			203			
Colour, True	TCU[1]	6.4			7.0			7.0			<5.0			6.4			6.2			
Dissolved Hardness (as $CaCO_3$)	mg/L	81.2			82.3			84.4			214			90.2			222			
Specific Conductivity (lab)	µS/cm	174			175			176			470			174			424			
Total Dissolved Solids	mg/L	104			112			100			296			114			275			
Total Suspended Solids	mg/L	<3.0			<3.0			<3.0			6.2			6.6			<3.0			
pH (lab)	pH units	8.07			8.09			8.11			8.41			8.14			8.54			6.5 - 9
Anions and Nutrients																				
Ammonia, Total (as N)	mg/L	0.0060			<0.0050			0.0231			0.0050			0.0146			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			0.61			<0.50			0.69			600
Fluoride (F)	mg/L	0.037			0.036			0.035			0.099			0.032			0.094			EQ
Nitrate (as N)	mg/L	0.0641			0.0640			0.0596			<0.0050			0.0602			0.0053			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0042			0.0043			0.0066			0.0116			0.0093			0.0049			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			<0.0020			<0.0020			0.0023			
Silicate (as SiO_2)	mg/L	4.31			4.27			4.23			3.70			4.16			4.69			
Sulfate (SO_4)	mg/L	11.8			12.0			12.0			57.7			12.3			31.5			
Total Kjeldahl Nitrogen	mg/L	0.089			0.089			0.115			0.073			0.109			0.082			
Total Nitrogen	mg/L	0.153			0.153			0.175			0.073			0.169			0.087			
Organic / Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	2.77			2.87			2.83			2.50			3.77			3.97			
Total Organic Carbon	mg/L	2.82			2.91			3.02			1.92			2.83			3.21			
Ion Balance																				
Anion Sum	mEq/L	1.67			1.68			1.67			4.94			1.75			4.74			
Cation - Anion Balance	% difference	0.30			0.59			2.05			5.33			3.05			1.15			
Cation Sum	mEq/L	1.68			1.70			1.74			4.44			1.86			4.85			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).

EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.

All samples were collected at a depth of 0.2 m.

[1]True Colour Units.

Table 21. Dissolved metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in October 2022.

Date	21-Oct-2022				18-Oct-2022		BC Short-Term Maximum WQG
Site	PC1	PR1	PR2	HD	PR3	MD	
Total Depth (m)	2.2	9.7	3.9	0.5	4.2	0.2	
Replicate	A	A	A	A	A	A	
Dissolved Metals (mg/L)							
Aluminum (Al) - Dissolved	0.0046	0.0046	0.0040	0.0020	0.0044	0.0079	
Antimony (Sb) - Dissolved	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	0.00011	
Arsenic (As) - Dissolved	0.00016	0.00018	0.00018	0.00014	0.00021	0.00022	
Barium (Ba) - Dissolved	0.0294	0.0291	0.0300	0.103	0.0304	0.182	
Beryllium (Be) - Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	<0.010	<0.010	<0.010	0.010	<0.010	0.013	
Cadmium (Cd) - Dissolved	0.0000070	0.0000079	0.0000084	0.0000055	0.0000056	0.0000062	EQ
Calcium (Ca) - Dissolved	23.6	23.7	24.4	55.8	26.5	61.4	
Cesium (Cs) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00024	
Copper (Cu) - Dissolved	0.00056	0.00057	0.00056	0.00033	0.00059	0.00041	EQ
Ferrous Iron (Fe(II)) - Dissolved	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Iron (Fe) - Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.35
Lead (Pb) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li) - Dissolved	<0.0010	<0.0010	0.0010	0.0070	0.0011	0.0064	
Magnesium (Mg) - Dissolved	5.42	5.62	5.69	18.2	5.83	16.7	
Manganese (Mn) - Dissolved	0.00045	0.00045	0.00038	0.00249	0.00044	0.0320	
Mercury (Hg) - Dissolved	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.00000176	0.00000179	
Methylmercury (MeHg) - Dissolved	<0.000000020	<0.000000020	<0.000000020	<0.000000020	<0.000000020	<0.000000020	
Molybdenum (Mo) - Dissolved	0.000740	0.000701	0.000732	0.00368	0.000725	0.000922	
Nickel (Ni) - Dissolved	0.00061	0.00062	0.00061	0.00083	0.00065	0.00125	
Phosphorus (P) - Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	0.406	0.407	0.416	0.660	0.420	1.19	
Rubidium (Rb) - Dissolved	0.00029	0.00030	0.00030	0.00027	0.00033	0.00032	
Selenium (Se) - Dissolved	0.000218	0.000251	0.000187	0.00122	0.000283	0.000219	
Silicon (Si) - Dissolved	2.03	1.98	1.94	1.74	1.93	2.26	
Silver (Ag) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	0.970	0.954	0.985	3.36	1.06	8.85	
Strontium (Sr) - Dissolved	0.0944	0.0936	0.0970	0.330	0.103	0.167	
Sulfur (S) - Dissolved	4.05	4.05	3.93	20.5	4.23	11.2	
Tellurium (Te) - Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Tungsten (W) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	0.000388	0.000384	0.000382	0.000763	0.000424	0.000760	
Vanadium (V) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn) - Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

All samples were collected at a depth of 0.2 m.

[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 22. Total metals concentrations in water quality samples collected from the Site C Reservoir Reach of the Peace River in October 2022.

Date	21-Oct-2022				18-Oct-2022		BC Short-Term Maximum WQG
Site	PC1	PR1	PR2	HD	PR3	MD	
Total Depth (m)	2.2	9.7	3.9	0.5	4.2	0.2	
Replicate	A	A	A	A	A	A	
Total Metals (mg/L)							
Aluminum (Al) - Total	0.0432	0.0355	0.0574	0.222	0.0809	0.0447	
Antimony (Sb) - Total	<0.00010	<0.00010	<0.00010	0.00018	<0.00010	<0.00010	
Arsenic (As) - Total	0.00020	0.00022	0.00021	0.00025	0.00023	0.00030	
Barium (Ba) - Total	0.0304	0.0314	0.0335	0.121	0.0325	0.197	
Beryllium (Be) - Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Total	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Total	<0.010	<0.010	<0.010	0.014	<0.010	0.013	1.2
Cadmium (Cd) - Total	0.0000128	0.0000163	0.0000175	0.0000272	0.0000169	0.0000111	
Calcium (Ca) - Total	25.7	25.6	26.8	68.3	27.1	60.3	
Cesium (Cs) - Total	<0.000010	<0.000010	<0.000010	0.000042	0.000016	<0.000010	
Chromium (Cr) - Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Total	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	0.00018	0.11
Copper (Cu) - Total	0.00070	0.00072	0.00088	0.00058	0.00078	0.00058	
Iron (Fe) - Total	0.036	0.046	0.074	0.248	0.115	0.183	1
Lead (Pb) - Total	<0.000050	<0.000050	<0.000050	0.000121	0.000065	<0.000050	EQ
Lithium (Li) - Total	0.0011	0.0011	0.0012	0.0086	0.0011	0.0059	
Magnesium (Mg) - Total	5.83	6.06	6.37	20.2	6.04	16.0	
Manganese (Mn) - Total	0.00197	0.00208	0.00314	0.00863	0.00397	0.0342	EQ
Mercury (Hg) - Total	<0.00000050	<0.00000050	0.00000050	0.00000080	0.00000083	0.00000112	
Methylmercury (MeHg) - Total	<0.000000020	<0.000000020	<0.000000020	<0.000000020	<0.000000020	<0.000000020	
Molybdenum (Mo) - Total	0.000802	0.000824	0.000889	0.00450	0.000767	0.000929	46
Nickel (Ni) - Total	0.00080	0.00076	0.00084	0.00127	0.00083	0.00130	
Phosphorus (P) - Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Total	0.429	0.439	0.474	0.792	0.445	1.14	
Rubidium (Rb) - Total	0.00038	0.00039	0.00044	0.00072	0.00046	0.00045	
Selenium (Se) - Total	0.000249	0.000253	0.000240	0.00140	0.000284	0.000202	
Silicon (Si) - Total	2.13	2.24	2.25	2.36	2.13	2.34	
Silver (Ag) - Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	EQ
Sodium (Na) - Total	1.03	1.04	1.14	3.69	1.11	9.26	
Strontium (Sr) - Total	0.102	0.105	0.110	0.405	0.104	0.177	
Sulfur (S) - Total	4.46	4.55	4.69	23.2	4.72	11.8	
Tellurium (Te) - Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	0.00074	0.00082	0.00132	<0.00600	0.00157	0.00071	
Tungsten (W) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	0.000423	0.000420	0.000444	0.000962	0.000416	0.000713	
Vanadium (V) - Total	<0.00050	<0.00050	0.00054	0.00106	0.00060	<0.00050	
Zinc (Zn) - Total	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	EQ
Zirconium (Zr) - Total	<0.00020	<0.00020	<0.00020	0.00025	<0.00020	<0.00020	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
All samples were collected at a depth of 0.2 m.

Table 23. Field measurements, physical tests, anions, nutrients, and organic carbon in water quality samples collected from the Downstream Reach of the Peace River in early June 2022.

Date	Units	03-Jun-2022												04-Jun-2022													BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		2.4			3.1			3.8			1.7			4.4			1.0			5.9			1.2			4.7			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	156.6	156.6	156.4	133.5	133.8	133.9	154.5	155.7	155.0	83.6	80.5	80.0	106.8	116.7	93.3	200.8	199.8	200.9	92.2	104.2	104.8	219.0	219.0	219.2	135.9	125.9	134.8	
Oxygen Dissolved (in situ)	mg/L	10.78	10.78	10.78	10.89	10.88	10.89	10.64	10.64	10.65	10.02	10.02	10.02	10.6	10.6	10.6	9.29	9.29	9.29	10.38	10.35	10.35	8.92	8.92	8.91	10.21	10.22	10.21	>5/>9
Redox Potential (in situ)	mV	179.9	179.5	178.5	179.3	177.4	177.1	101.1	101.1	101.4	81.7	82.5	84.0	194.3	193.0	191.7	187.9	186.1	184.2	113.7	114.0	113.8	131.2	-	131.8	126.1	125.6	125.4	
Salinity (in situ)	ppt	0.10	0.10	0.10	0.09	0.09	0.09	0.10	0.10	0.10	0.05	0.05	0.05	0.07	0.08	0.06	0.12	0.12	0.12	0.06	0.07	0.07	0.12	0.12	0.12	0.09	0.08	0.09	
Specific Conductivity (in situ)	µS/cm	219.3	219.4	219.2	193.3	193.7	194.0	217.3	218.7	218.2	111.7	107.6	106.9	150.1	164.0	131.2	242.7	241.4	242.8	127.0	143.1	143.6	254.0	253.9	254.0	184.6	171.0	182.1	
Temperature (in situ)	°C	10.0	10.0	10.0	8.8	8.8	8.8	9.9	9.9	9.8	11.8	11.8	11.8	9.9	9.9	9.9	16.0	16.0	16.0	10.7	10.8	10.8	17.8	17.8	17.8	11.2	11.2	11.2	
Total Dissolved Solids (in situ)	mg/L	143	143	142	126	126	126	141	142	142	73	70	69	98	107	85	158	157	158	83	93	93	165	165	165	120	111	119	
Turbidity (in situ)	NTU	169.09	170.19	167.45	230.51	217.91	219.14	212.16	214.17	209.3	504.6	506.65	497.23	257.45	297.88	269.67	496.23	499.35	496.92	-	282.31	262.6	436.79	428.25	423.03	280.59	325.94	282.52	
pH (in situ)	pH units	7.98	7.99	7.98	7.95	7.97	7.96	7.90	7.90	7.90	7.31	7.31	7.30	7.85	7.85	7.85	8.19	8.19	8.20	7.85	7.84	7.84	7.95	7.95	7.95	7.80	7.80	7.80	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	100			97.8			106			22.7			97.4			128			88.0			73.9			90.0			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	100			97.8			106			22.7			97.4			128			88.0			73.9			90.0			
Colour, True	TCU[1]	22.3			28.3			27.4			181			31.3			63.3			54.4			110			51.9			
Dissolved Hardness (as $CaCO_3$)	mg/L	114			106			119			54.1			95.5			115			91.0			105			92.7			
Specific Conductivity (lab)	µS/cm	227			203			227			122			209			255			199			265			204			
Total Dissolved Solids	mg/L	219			204			254			174			162			299			176			298			178			
Total Suspended Solids	mg/L	240			559			361			1,080			436			791			490			757			489			
pH (lab)	pH units	8.03			8.05			8.07			7.21			8.17			8.19			8.08			7.92			8.08			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0173			0.0130			0.0149			0.0463			0.0156			0.0515			0.0198			0.0742			0.0192			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50			<0.50			0.78			<0.50			2.24			<0.50			600
Fluoride (F)	mg/L	0.068			0.061			0.068			0.086			0.058			0.083			0.065			0.103			0.065			EQ
Nitrate (as N)	mg/L	0.0769			0.124			0.0862			0.0088			0.0841			0.0317			0.0659			0.0511			0.0732			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010			0.0014			0.0012			0.0016			0.0064			0.0014			
Orthophosphate - Dissolved (as P)	mg/L	0.0045			0.0046			0.0043			0.0079			0.0042			0.0051			0.0067			0.0121			0.0069			
Phosphorus (P) - Total	mg/L	0.245			0.545			0.372			1.05			0.398			0.582			0.400			0.479			0.401			
Phosphorus (P) - Total Dissolved	mg/L	0.0072			0.0067			0.0077			0.0192			0.0082			0.0130			0.0107			0.0254			0.0107			
Sulfate (SO_4)	mg/L	20.3			8.65			18.1			28.6			13.1			13.3			16.4			53.3			16.9			
Total Kjeldahl Nitrogen	mg/L	0.191			0.437			0.351			1.35			0.164			0.470			0.246			0.734			0.291			
Total Nitrogen	mg/L	0.268			0.561			0.437			1.36			0.250			0.503			0.314			0.792			0.366			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	5.94			6.62			6.68			32.8			7.17			17.4			10.6			25.5			10.9			
Total Organic Carbon	mg/L	6.29			14.0			11.9			39.7			7.32			17.2			10.8			24.7			11.2			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
All samples were collected at a depth of 0.2 m.
Dissolved oxygen saturation (Oxygen Dissolved (in situ) (%)) was not recorded during the early June sampling event.
Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the early June sampling event. These parameters were not requested as part of the RFQ and were added to the analysis during subsequent sampling events in 2022.
Black dashes (-) indicate that no data were collected.
Red dashes (-) indicate that values were removed because they were considered anomalous.
[1]True Colour Units.

Table 24. Dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in early June 2022.

Date	03-Jun-2022				04-Jun-2022					BC Short-Term Maximum WQG
Site	PD1	PINE	PD2	BEA	PD3	KR	PD4	POUCE	PD5	
Total Depth (m)	2.4	3.1	3.8	1.7	4.4	1.0	5.9	1.2	4.7	
Replicate	A	A	A	A	A	A	A	A	A	
Dissolved Metals (mg/L)										
Aluminum (Al) - Dissolved	0.0231	0.0235	0.0295	0.0718	0.0356	0.0416	0.0544	0.0699	0.0427	
Antimony (Sb) - Dissolved	0.00011	0.00012	0.00013	0.00017	0.00012	0.00021	0.00013	0.00023	0.00014	
Arsenic (As) - Dissolved	0.00024	0.00017	0.00022	0.00066	0.00025	0.00061	0.00034	0.00090	0.00039	
Barium (Ba) - Dissolved	0.0552	0.0660	0.0601	0.0302	0.0569	0.0674	0.0514	0.0340	0.0508	
Beryllium (Be) - Dissolved	<0.000020	<0.000020	<0.000020	0.000037	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	<0.010	<0.010	<0.010	0.019	<0.010	0.012	<0.010	0.035	<0.010	
Cadmium (Cd) - Dissolved	0.0000127	0.0000106	0.0000141	0.0000352	0.0000141	0.0000105	0.0000228	0.0000152	0.0000151	EQ
Calcium (Ca) - Dissolved	32.0	30.4	34.1	15.1	26.7	32.1	25.7	28.9	26.1	
Cesium (Cs) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	0.00016	0.00015	0.00014	0.00062	0.00013	0.00019	0.00020	0.00036	0.00018	
Copper (Cu) - Dissolved	0.00117	0.00100	0.00120	0.00296	0.00103	0.00299	0.00146	0.00370	0.00156	EQ
Iron (Fe) - Dissolved	0.038	0.050	0.050	0.449	0.066	0.071	0.136	0.262	0.114	0.35
Lead (Pb) - Dissolved	<0.000050	0.000055	<0.000050	0.000177	0.000050	0.000066	0.000091	0.000242	0.000085	
Lithium (Li) - Dissolved	0.0032	0.0034	0.0034	0.0052	0.0028	0.0023	0.0032	0.0046	0.0032	
Magnesium (Mg) - Dissolved	8.20	7.28	8.34	3.99	7.00	8.55	6.51	7.90	6.68	
Manganese (Mn) - Dissolved	0.00762	0.00544	0.00627	0.0501	0.00549	0.00717	0.0118	0.0119	0.00918	
Mercury (Hg) - Dissolved	0.00000148	0.00000241	0.00000182	0.00000457	0.00000124	0.00000198	0.00000144	0.00000370	0.00000162	
Methylmercury (MeHg) - Dissolved	<0.000000020	0.000000024	0.000000022	0.000000147	0.000000024	0.000000045	0.000000057	0.000000226	0.000000051	
Molybdenum (Mo) - Dissolved	0.00109	0.000594	0.00114	0.000390	0.000814	0.000723	0.000778	0.000696	0.000739	
Nickel (Ni) - Dissolved	0.00159	0.00119	0.00160	0.00527	0.00137	0.00241	0.00205	0.00409	0.00202	
Phosphorus (P) - Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	0.759	0.510	0.720	1.69	0.601	1.69	0.818	3.69	0.887	
Rubidium (Rb) - Dissolved	0.00032	<0.00020	0.00029	0.00059	0.00026	0.00048	0.00035	0.00088	0.00030	
Selenium (Se) - Dissolved	0.000442	0.000418	0.000502	0.000255	0.000407	0.000344	0.000399	0.000326	0.000403	
Silicon (Si) - Dissolved	2.14	1.48	2.01	2.00	1.68	2.21	1.74	2.19	1.77	
Silver (Ag) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	1.99	1.43	1.98	4.62	1.64	4.82	2.24	8.07	2.39	
Strontium (Sr) - Dissolved	0.131	0.0932	0.126	0.0588	0.0962	0.129	0.0925	0.129	0.0938	
Sulfur (S) - Dissolved	6.52	2.73	5.89	8.94	4.39	4.52	5.40	18.0	5.52	
Tellurium (Te) - Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium (Th) - Dissolved	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	0.00054	<0.00030	0.00086	0.00087	0.00102	0.00141	0.00183	0.00569	0.00167	
Tungsten (W) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	0.000598	0.000244	0.000484	0.000252	0.000346	0.000533	0.000357	0.000578	0.000379	
Vanadium (V) - Dissolved	<0.00050	0.00052	0.00054	0.00068	<0.00050	0.00064	<0.00050	0.00084	<0.00050	
Zinc (Zn) - Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	<0.00030	<0.00030	<0.00030	0.00064	<0.00030	<0.00030	<0.00060	<0.00090	<0.00030	

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.
All samples were collected at a depth of 0.2 m.

Table 25. Total metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in early June 2022.

Date	03-Jun-2022				04-Jun-2022					BC Short-Term Maximum WQG
Site	PD1	PINE	PD2	BEA	PD3	KR	PD4	POUCE	PD5	
Total Depth (m)	2.4	3.1	3.8	1.7	4.4	1.0	5.9	1.2	4.7	
Replicate	A	A	A	A	A	A	A	A	A	
Total Metals (mg/L)										
Aluminum (Al) - Total	3.60	3.47	4.65	8.32	4.64	10.4	5.51	9.68	5.78	
Antimony (Sb) - Total	0.00030	0.00027	0.00035	0.00041	0.00037	0.00044	0.00038	0.00037	0.00036	
Arsenic (As) - Total	0.00300	0.00316	0.00409	0.0102	0.00462	0.00822	0.00582	0.0117	0.00580	
Barium (Ba) - Total	0.209	0.266	0.253	0.451	0.294	0.463	0.326	0.392	0.335	
Beryllium (Be) - Total	0.000248	0.000272	0.000311	0.000794	0.000335	0.000707	0.000432	0.000727	0.000432	
Bismuth (Bi) - Total	0.000054	<0.000050	0.000075	0.000159	0.000090	0.000194	0.000117	0.000210	0.000130	
Boron (B) - Total	0.011	0.010	0.012	0.029	0.012	0.024	0.016	0.052	0.017	1.2
Cadmium (Cd) - Total	0.000332	0.000431	0.000417	0.000709	0.000518	0.000851	0.000522	0.000398	0.000516	
Calcium (Ca) - Total	39.2	41.2	41.1	20.1	42.1	64.3	39.7	40.2	38.0	
Cesium (Cs) - Total	0.000835	0.000722	0.00113	0.00210	0.00117	0.00209	0.00157	0.00225	0.00162	
Chromium (Cr) - Total	0.00612	0.00587	0.00812	0.0156	0.00852	0.0183	0.0103	0.0172	0.0109	
Cobalt (Co) - Total	0.00299	0.00373	0.00400	0.0116	0.00501	0.0104	0.00610	0.0105	0.00653	0.11
Copper (Cu) - Total	0.00900	0.00939	0.0116	0.0278	0.0132	0.0294	0.0160	0.0298	0.0169	
Iron (Fe) - Total	6.80	8.17	9.66	24.1	11.5	23.2	14.6	23.6	15.0	1
Lead (Pb) - Total	0.00365	0.00509	0.00496	0.0127	0.00610	0.0121	0.00746	0.0124	0.00792	EQ
Lithium (Li) - Total	0.0072	0.0077	0.0089	0.0183	0.0094	0.0173	0.0116	0.0195	0.0118	
Magnesium (Mg) - Total	10.6	10.4	11.1	7.13	10.3	15.8	9.20	12.0	9.53	
Manganese (Mn) - Total	0.112	0.175	0.154	0.353	0.215	0.372	0.219	0.274	0.230	EQ
Mercury (Hg) - Total	0.0000133	0.0000370	0.0000316	0.0000486	0.0000382	0.0000413	0.0000327	0.00000888	0.0000217	
Methylmercury (MeHg) - Total	<0.00000020	<0.00000020	<0.00000020	<0.00000020	<0.00000020	<0.00000020	<0.00000020	<0.00000020	0.000000201	
Molybdenum (Mo) - Total	0.00125	0.000785	0.00125	0.000784	0.00102	0.000849	0.000964	0.000979	0.000902	46
Nickel (Ni) - Total	0.0115	0.0127	0.0150	0.0372	0.0173	0.0370	0.0208	0.0351	0.0218	
Phosphorus (P) - Total	0.295	0.482	0.365	0.780	0.532	0.679	0.529	0.671	0.470	
Potassium (K) - Total	1.77	1.50	2.02	3.40	1.97	3.98	2.20	5.75	2.30	
Rubidium (Rb) - Total	0.00854	0.00810	0.0104	0.0185	0.0109	0.0196	0.0136	0.0209	0.0137	
Selenium (Se) - Total	0.000596	0.000541	0.000693	0.000761	0.000736	0.000898	0.000927	0.000871	0.000746	
Silicon (Si) - Total	7.49	6.00	8.64	13.2	7.60	16.5	9.32	16.4	9.82	
Silver (Ag) - Total	0.000071	0.000068	0.000098	0.000191	0.000105	0.000236	0.000143	0.000169	0.000148	EQ
Sodium (Na) - Total	2.06	1.44	2.04	4.44	1.88	5.38	2.31	9.29	2.51	
Strontium (Sr) - Total	0.147	0.118	0.150	0.0985	0.144	0.214	0.145	0.213	0.147	
Sulfur (S) - Total	7.16	3.17	6.76	10.5	4.55	4.97	6.01	19.5	5.93	
Tellurium (Te) - Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	0.000104	0.000103	0.000138	0.000216	0.000143	0.000260	0.000167	0.000200	0.000171	
Thorium (Th) - Total	0.00094	0.00096	0.00132	0.00369	0.00124	0.00323	0.00182	0.00345	0.00201	
Tin (Sn) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	0.0355	0.0184	0.0359	0.0322	0.0246	0.0344	0.0269	0.0361	0.0277	
Tungsten (W) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	0.000750	0.000591	0.000800	0.00137	0.000807	0.00133	0.000936	0.00153	0.000991	
Vanadium (V) - Total	0.0146	0.0140	0.0183	0.0321	0.0185	0.0350	0.0208	0.0322	0.0213	
Zinc (Zn) - Total	0.0352	0.0414	0.0467	0.117	0.0604	0.115	0.0705	0.101	0.0726	EQ
Zirconium (Zr) - Total	<0.00020	<0.00020	<0.00020	0.00067	0.00022	0.00059	0.00033	0.00128	0.00034	

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
All samples were collected at a depth of 0.2 m.

Table 26. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in late June 2022.

Date	Units	29-Jun-2022																						30-Jun-2022			BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		3.0			3.5			4.5			1.6			3.5			2.5			5.0			1.0			1.1			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	174.1	175.6	174.9	136.1	121.6	135.8	167.1	162.0	168.7	93.0	92.5	93.2	157.7	156.6	154.5	272.9	273.2	273.2	137.1	143.9	151.1	396.8	397.7	397.9	156.8	156.6	156.9	
Oxygen Dissolved (in situ)	mg/L	10.38	10.38	10.39	10.3	10.3	10.3	10.18	10.19	10.17	9.13	9.13	9.13	10.13	10.12	10.12	8.93	8.93	8.93	9.95	9.97	9.99	8.87	8.87	8.86	9.95	9.95	9.96	>5/>9
Oxygen Dissolved (in situ)	%	96.0	96.1	96.1	93.7	93.7	93.7	94.6	94.6	94.6	92.8	92.8	92.8	94.5	94.5	94.6	95.7	95.8	95.8	94.5	94.6	94.6	99.8	100	99.8	95.3	95.3	95.3	
Redox Potential (in situ)	mV	112.8	114.7	116.2	120.5	124.2	126.6	141.3	143.1	143.7	138.8	138.2	137.8	136.3	137.8	139.1	115.0	119.2	120.8	127.0	129.5	132.6	120.2	130.7	133.1	105.2	105.9	107.7	
Salinity (in situ)	ppt	0.11	0.11	0.11	0.09	0.08	0.09	0.11	0.10	0.11	0.05	0.05	0.05	0.10	0.10	0.10	0.15	0.15	0.15	0.08	0.09	0.09	0.21	0.21	0.21	0.1	0.1	0.1	
Specific Conductivity (in situ)	µS/cm	232.5	234.5	233.6	185.3	165.6	184.9	222.0	215.5	223.9	112.1	111.3	112.2	208.6	206.9	204.0	310.6	310.6	310.6	177.7	186.9	196.8	428.7	428.8	429.4	201.6	201.4	201.7	
Temperature (in situ)	°C	11.8	11.8	11.8	11.1	11.1	11.1	12.1	12.0	12.1	16.1	16.1	16.2	12.2	12.3	12.3	18.7	18.7	18.7	13.0	13.0	12.9	21.1	21.2	21.2	13.4	13.4	13.4	
Total Dissolved Solids (in situ)	mg/L	151	152	152	120	108	120	144	140	146	73	72	73	136	135	133	202	202	202	116	121	128	279	279	279	131	131	131	
Turbidity (in situ)	NTU	77.5	76.23	83.61	64.06	70.45	65.21	86.29	95.01	80.85	210.02	218.54	213.04	125.03	90.61	93.07	191.38	193.72	199.94	103.43	112.51	94.14	63.27	62.7	70.36	87.7	87.00	87.59	
pH (in situ)	pH units	7.94	7.92	7.92	7.85	7.84	7.83	8.01	7.99	8.00	7.42	7.41	7.40	7.96	7.95	7.94	8.39	8.35	8.35	7.98	7.98	7.96	8.39	8.28	8.26	7.92	7.93	7.91	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	113			99.1			111			31.5	31.3		107			171			94.9			124			98.5			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	113			99.1			111			31.5	31.3		107			171			94.9			124			98.5			
Dissolved Hardness (as $CaCO_3$)	mg/L	122			97.8			111			51.9	51.6		108			157			99.3			185			97.2			
Specific Conductivity (lab)	µS/cm	240			190			227			114	115		218			318			204			439			195			
Total Dissolved Solids	mg/L	174			127			170			210	216		158			290			167			347			144			
Total Suspended Solids	mg/L	128			118			121			276	304		144			170			170			40.8			121			
pH (lab)	pH units	8.12			8.08			8.10			7.38	7.37		8.09			8.27			8.05			8.14			8.01			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0140			0.0060			0.0164			0.0378	0.0278		0.0110			0.0503			0.0108			0.0376			0.0157			EQ
Chloride (Total)	mg/L	<0.50			<0.50			<0.50			<0.50	<0.50		<0.50			0.72			<0.50			4.26			<0.50			600
Fluoride (F)	mg/L	0.056			0.045			0.060			0.070	0.071		0.053			0.090			0.054			0.134			0.047			EQ
Nitrate (as N)	mg/L	0.0460			0.0470			0.0461			<0.0050	<0.0050		0.0449			0.0218			0.0399			<0.0050			0.0485			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010			<0.0010	<0.0010		<0.0010			0.0110			<0.0010			<0.0010			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	0.0036			0.0032			0.0031			0.0070	0.0071		0.0039			0.0068			0.0046			0.0040			0.0014			
Phosphorus (P) - Total	mg/L	0.168			0.139			0.188			0.377	0.380		0.185			0.223			0.197			0.222			0.155			
Phosphorus (P) - Total Dissolved	mg/L	0.0052			0.0050			0.0053			0.0185	0.0192		0.0070			0.0122			0.0071			0.0165			0.0082			
Silicate (as SiO_2)	mg/L	4.29			2.48			3.70			4.82	4.81		3.40			4.79			3.56			2.44			3.69			
Sulfate (SO_4)	mg/L	20.6			7.87			17.1			22.0	22.0		14.8			12.8			15.4			99.1			14.4			
Total Kjeldahl Nitrogen	mg/L	0.346			0.282			0.339			1.31	1.26		0.406			0.869			0.480			1.06			0.430			
Total Nitrogen	mg/L	0.255			0.203			0.272			0.989	0.880		0.267			0.656			0.327			1.01			0.478			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	5.02			3.46			5.01			32.0	34.8		8.67			15.3			7.52			25.1			7.37			
Total Organic Carbon	mg/L	7.66			5.56			7.49			41.3	42.1		8.20			20.5			11.5			27.8			8.26			
Ion Balance																													
Anion Sum	mEq/L	2.69			2.15			2.58			1.09	1.09		2.45			3.71			2.22			4.67			2.27			
Cation - Anion Balance	% difference	3.26			3.12			5.74			8.40	8.40		4.48			3.78			3.26			0.973			5.34			
Cation Sum	mEq/L	2.52			2.02			2.30			1.29	1.29		2.24			3.44			2.08			4.58			2.04			
Dissolved Metals																													
Calcium (Ca) - Dissolved	mg/L	33.8			28.4			31.6			14.8	14.7		30.2			44.1			27.8			50.3			27.6			
Magnesium (Mg) - Dissolved	mg/L	9.05			6.53			7.79			3.64	3.63		7.83			11.3			7.26			14.4			6.86			
Potassium (K) - Dissolved	mg/L	-			-			-			-	-		-			-			-			-			0.503			
Sodium (Na) - Dissolved	mg/L	-			-			-			-	-		-			-			-			-			1.74			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
Black dashes (-) indicate that no data were collected.
All samples were collected at a depth of 0.2 m.

Table 27. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in July 2022.

Date	Units	27-Jul-2022																						28-Jul-2022			BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		3.4			2.3			3.5			1.5			4.2			0.4			3.5			0.2			2.8			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	152.0	152.0	152.0	214.9	214.5	213.4	160.8	160.7	160.6	184.3	184.2	184.2	138.1	129.9	135.3	429.1	429.5	429.8	175.5	175.6	175.6	962	962	963	170.9	171.2	171.2	
Oxygen Dissolved (in situ)	mg/L	10.69	10.7	10.69	8.86	8.86	8.86	10.31	10.32	10.31	8.06	8.06	8.06	10.05	10.04	10.04	8.27	8.25	8.27	9.76	9.77	9.76	8.39	8.39	8.39	9.62	9.62	9.62	>5/>9
Oxygen Dissolved (in situ)	%	101.4	101.4	101.4	95.7	95.7	95.7	100.8	100.9	100.9	94.7	94.8	94.7	99.9	99.9	99.8	100.0	99.8	100.1	99.4	99.5	99.4	105.5	105.5	105.5	97.9	98.0	98.0	
Redox Potential (in situ)	mV	67.7	69.4	69.8	139.3	138.6	138.0	201.4	201.3	201.0	163.9	163.2	163.1	176.8	177.0	177.1	143.9	151.6	149.7	202.8	201.5	200.4	179.9	178.2	177.0	96.9	98.0	98.5	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.12	0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.21	0.21	0.21	0.10	0.10	0.10	0.45	0.45	0.45	0.10	0.10	0.10	
Specific Conductivity (in situ)	µS/cm	197.5	197.4	197.4	242.2	241.7	240.8	201.9	201.8	201.6	190.0	189.9	189.9	170.3	160.1	166.8	429.8	429.9	429.8	210.9	211.0	211.0	927	927	927	205.5	205.7	205.7	
Temperature (in situ)	°C	12.9	12.9	13.0	19.1	19.1	19.1	14.3	14.3	14.3	23.4	23.4	23.4	15.1	15.1	15.1	24.9	25.0	25.0	16.2	16.2	16.2	27.0	27.0	27.0	16.2	16.2	16.2	
Total Dissolved Solids (in situ)	mg/L	128	128	128	157	157	156	131	131	131	123	123	123	111	104	108	279	279	279	137	137	137	603	603	603	134	134	134	
Turbidity (in situ)	NTU	26.35	21.68	23.98	12.87	11.20	10.01	25.01	26.36	24.08	33.49	33.55	33.96	35.99	52.52	91.07	17.80	19.21	18.34	22.43	22.09	23.45	4.73	4.74	4.65	19.23	19.43	19.17	
pH (in situ)	pH units	7.99	7.99	7.98	8.20	8.20	8.20	8.00	7.99	7.98	7.82	7.83	7.83	7.95	7.93	7.91	8.52	8.52	8.51	8.04	8.05	8.05	8.39	8.39	8.39	7.93	7.93	7.93	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	98.4			120	122		88.3	95.2		63.1			96.1			205			97.6			213			93.4			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			<1.0	<1.0		<1.0	<1.0		<1.0			<1.0			23.0			<1.0			22.4			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0	<1.0		<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	98.4			120	122		88.3	95.2		63.1			96.1			228			97.6			235			93.4			
Colour, True	TCU[1]	6.7			<5.0	5.1		6.3	6.5		203			9.3			20.5			9.8			29.5			9.1			
Dissolved Hardness (as $CaCO_3$)	mg/L	103			126	126		105	105		81.8			105			206			108			369			108			
Specific Conductivity (lab)	µS/cm	196			233	234		196	197		185			201			411			207			893			201			
Total Dissolved Solids	mg/L	138			158	151		137	142		213			145			287			145			685			135			
Total Suspended Solids	mg/L	78.3			19.1	12.7		88.7	94.1		19.7			96.1			19.3			83.3			5.3			41.7			
pH (lab)	pH units	8.09			8.26	8.26		8.09	8.11		7.80			8.10			8.63			8.15			8.57			8.13			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0069			0.0067	<0.0050		0.0063	0.0058		0.0323			<0.0050			0.0101			0.0092			0.0135			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			0.65	0.61		<0.50	<0.50		0.65			<0.50			1.36			<0.50			14.1			<0.50			600
Fluoride (F)	mg/L	0.042			0.054	0.053		0.043	0.044		0.092			0.044			0.103			0.046			0.245			0.046			EQ
Nitrate (as N)	mg/L	0.0607			0.0225	0.0168		0.0532	0.0613		<0.0050			0.0585			<0.0050			0.0435			<0.0050			0.0484			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010	<0.0010		<0.0010	<0.0010		<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010	<0.0010		<0.0010	<0.0010		0.0041			<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.101			0.0214	0.0139		0.102	0.0935		0.0703			0.132			0.0269			0.0890			0.0186			0.0626			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020	<0.0020		<0.0020	<0.0020		0.0124			<0.0020			0.0024			0.0025			0.0069			<0.0020			
Silicate (as SiO_2)	mg/L	4.38			2.18	2.17		4.36	4.32		5.78			4.20			4.09			4.09			0.76			4.04			
Sulfate (SO_4)	mg/L	15.8			14.0	13.7		16.4	16.2		33.4			16.4			24.1			17.0			252			16.0			
Total Kjeldahl Nitrogen	mg/L	0.158			0.340	0.055		0.209	0.213		0.510			0.197			0.424			0.204			0.803			0.152			
Total Nitrogen	mg/L	0.219			0.362	0.072		0.262	0.274		0.510			0.256			0.424			0.248			0.803			0.200			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	2.50			1.75	1.48		2.70	2.55		32.7			2.66			10.4			3.73			19.2			2.97			
Total Organic Carbon	mg/L	2.62			2.83	1.58		2.56	2.44		35.9			3.15			11.4			3.17			20.3			2.93			
Dissolved Metals																													
Calcium (Ca) - Dissolved	mg/L	29.8			36.4	36.4		30.2	30.3		23.1			30.4			56.7			31.2			96.3			31.2			
Magnesium (Mg) - Dissolved	mg/L	6.92			8.60	8.62		7.10	7.07		5.87			7.14			15.7			7.33			31.2			7.30			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
All samples were collected at a depth of 0.2 m.
Ion balance parameters (Anion Sum, Cation Sum, Cation - Anion Balance) were not analyzed for the July sampling event; these parameters were not requested as part of the RFQ.
[1]True Colour Units.

Table 28. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in August 2022.

Date	Units	19-Aug-2022												23-Aug-2022												24-Aug-2022			BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		2.2			2.4			3.8			1.5			4.3			0.2			2.8			1.0			6.9			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	154.4	154.4	154.4	268.9	268.9	268.8	161.4	161.6	161.7	198.8	198.8	198.8	162.1	162.2	162.2	449.7	449.8	450.1	164.5	164.3	164.3	1,142	1,142	1,143	166.1	166	166	
Oxygen Dissolved (in situ)	mg/L	10.5	10.51	10.52	8.56	8.56	8.56	10.28	10.28	10.28	8.22	8.22	8.22	10.42	10.42	10.42	8.66	8.66	8.66	10.18	10.18	10.17	7.88	7.88	7.88	10.18	10.18	10.19	>5/>9
Oxygen Dissolved (in situ)	%	100.1	100.1	100.2	96.6	96.6	96.6	100.1	100.2	100.3	96.3	96.3	96.3	100.1	100.2	100.2	101.6	101.6	101.7	98.5	98.5	98.4	90.1	90.2	90.2	98.8	98.7	98.8	
Redox Potential (in situ)	mV	88.9	89.1	89.2	102.5	102.5	102.5	116.7	117.2	117.7	148.3	148.2	148.1	113.9	114.7	116.9	111.1	111.7	112.5	119.3	116.9	112.6	88	89.8	91.3	98	99.5	101.3	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.14	0.14	0.14	0.10	0.10	0.10	0.10	0.10	0.10	0.1	0.1	0.1	0.22	0.22	0.22	0.1	0.1	0.1	0.61	0.61	0.61	0.1	0.1	0.1	
Specific Conductivity (in situ)	µS/cm	199.5	199.6	199.6	289.4	289.4	289.4	203.7	203.8	203.7	205.8	205.8	205.7	207.6	207.6	207.6	465.1	465.1	465	209	208.7	208.5	1,215	1,215	1,215	210.5	210.4	210.5	
Temperature (in situ)	°C	13.1	13.1	13.1	21.3	21.3	21.3	14.1	14.2	14.2	23.2	23.2	23.2	13.5	13.6	13.6	23.3	23.3	23.3	13.9	13.9	13.9	21.8	21.8	21.9	14	13.9	13.9	
Total Dissolved Solids (in situ)	mg/L	130	130	130	188	188	188	132	132	132	134	134	134	135	135	135	302	302	302	136	136	136	790	790	790	137	137	137	
Turbidity (in situ)	NTU	9.69	9.64	9.67	2.54	2.57	2.56	10.75	10.84	10.97	32.48	32.49	32.71	3.65	4.13	4.73	14.74	14.53	14.54	4.24	3.57	4.05	4.23	3.88	4.01	3.7	3.5	3.69	
pH (in situ)	pH units	7.79	7.79	7.79	8.32	8.32	8.32	7.92	7.91	7.90	7.78	7.78	7.78	7.86	7.85	7.85	8.4	8.4	8.40	7.80	7.80	7.83	8.18	8.18	8.18	7.86	7.86	7.85	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	83.4	83.9		123			85.3			62.0			88.9			192			88.3			184			89.9			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0	<1.0		6.8			<1.0			<1.0			<1.0			14.2			<1.0			9.0			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	83.4	83.9		130			85.3			62.0			88.9			206			88.3			193			89.9			
Colour, True	TCU[1]	5.3	5.5		<5.0			5.8			226			6.0			10.2			10.6			13.9			6.8			
Dissolved Hardness (as $CaCO_3$)	mg/L	93.8	93.3		143			95.1			83.8			102			208			106			416			105			
Specific Conductivity (lab)	µS/cm	190	189		270			194			192			192			420			192			1,100			193			
Total Dissolved Solids	mg/L	134	129		173			128			233			133			282			124			908			116			
Total Suspended Solids	mg/L	31.2	31.6		<3.0			33.0			18.6			<3.0			29.7			10.1			<3.0			<3.0			
pH (lab)	pH units	8.14	8.12		8.40			8.15			7.90			8.17			8.54			8.15			8.40			8.20			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0112	0.0064		<0.0050			<0.0050			0.0110			<0.0050			0.0052			<0.0050			0.0183			<0.0050			EQ
Chloride (Total)	mg/L	<0.50	<0.50		0.85			<0.50			0.56			<0.50			1.08			<0.50			21.8			<0.50			600
Fluoride (F)	mg/L	0.034	0.034		0.055			0.036			0.088			0.037			0.106			0.038			0.252			0.043			EQ
Nitrate (as N)	mg/L	0.0674	0.0683		<0.0050			0.0640			<0.0050			0.0566			<0.0050			0.0543			<0.0250			0.0499			32.8
Nitrite (as N)	mg/L	0.0029	0.0024		<0.0010			0.0026			<0.0010			0.0016			<0.0010			0.0016			<0.0050			0.0016			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010	<0.0010		<0.0010			<0.0010			0.0120			<0.0010			<0.0010			<0.0010			<0.0010			0.0017			
Phosphorus (P) - Total	mg/L	0.0412	0.0401		0.0079			0.0335			0.0735			0.0109			0.0222			0.0128			0.0120			0.0114			
Phosphorus (P) - Total Dissolved	mg/L	0.0021	<0.0020		<0.0020			0.0023			0.0230			<0.0020			<0.0020			<0.0020			0.0045			<0.0020			
Silicate (as SiO_2)	mg/L	4.37	4.36		1.97			4.26			6.39			4.20			2.83			4.20			0.60			4.17			
Sulfate (SO_4)	mg/L	14.8	14.9		18.0			15.0			30.8			15.2			36.6			15.4			396			14.9			
Total Kjeldahl Nitrogen	mg/L	0.134	0.113		0.057			0.124			1.05			0.080			0.324			0.077			0.530			0.094			
Total Nitrogen	mg/L	0.163	0.158		0.063			0.156			0.815			0.136			0.301			0.145			0.523			0.155			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	2.53	2.74		1.41			2.89			37.6			2.97			7.89			4.01			11.7			2.95			
Total Organic Carbon	mg/L	2.48	2.66		1.31			2.86			37.3			2.89			8.28			3.40			12.1			3.09			
Ion Balance																													
Anion Sum	mEq/L	1.98	1.99		3.00			2.02			1.90			2.10			4.91			2.09			12.7			2.11			
Cation - Anion Balance	% difference	1.02	1.53		0.167			1.25			7.54			0.474			2.48			2.34			1.93			1.63			
Cation Sum	mEq/L	1.94	1.93		2.99			1.97			2.21			2.12			5.16			2.19			13.2			2.18			
Dissolved Metals																													
Calcium (Ca) - Dissolved	mg/L	27.1	27.0		40.5			27.5			23.0			29.1			49.5			30.7			102			30.2			
Magnesium (Mg) - Dissolved	mg/L	6.35	6.28		10.1			6.43			6.40			7.24			20.6			7.02			39.3			7.21			

Yellow shading indicates an exceedance of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
All samples were collected at a depth of 0.2 m.
[1]True Colour Units.

Table 29. Field measurements, physical tests, anions, nutrients, organic carbon, and dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in September 2022.

Date	Units	22-Sep-2022						19-Sep-2022																20-Sep-2022			BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		3.6			0.9			3.6			0.3			3.2			0.3			4.4			0.1			2.4			
Sample Depth (m)		0.2			0.2			0.2			0.2			0.2			0.2			0.2			0.1			0.2			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	148.7	148.6	148.6	254.4	254.5	254.5	149.4	149.4	149.4	308.9	308.9	308.8	134.1	110.9	109.7	432.4	432.5	432.7	151.4	155.4	154.1	992	992	992	157.7	157.9	157.7	
Oxygen Dissolved (in situ)	mg/L	10.38	10.37	10.37	10.16	10.16	10.16	10.27	10.27	10.27	9.94	9.94	9.95	10.24	10.23	10.23	10.45	10.45	10.45	10.31	10.31	10.31	10.11	10.11	10.11	10.33	10.34	10.34	>5/>9
Oxygen Dissolved (in situ)	%	97.5	97.4	97.4	94.1	94.1	94.1	97.1	97.1	97.2	90.7	90.7	90.7	96.8	96.8	96.8	96.0	96.0	96.0	97.6	97.6	97.6	96.1	96.1	96.1	98.0	98.1	98.1	
Redox Potential (in situ)	mV	87.4	88.4	90.5	104.5	106.0	106.8	138.9	139.3	139.5	137.7	137.7	137.7	126.7	127.0	127.5	130.2	130.6	130.7	131.9	132.4	132.6	131.6	132.0	132.3	113.8	114.0	114.3	
Salinity (in situ)	ppt	0.09	0.09	0.09	0.16	0.16	0.16	0.09	0.09	0.09	0.20	0.20	0.20	0.08	0.07	0.07	0.28	0.28	0.28	0.09	0.10	0.10	0.65	0.65	0.65	0.10	0.10	0.10	
Specific Conductivity (in situ)	µS/cm	195.2	195.1	195.2	339.7	339.6	339.7	194.6	194.7	194.7	419.4	419.6	419.5	174.7	144.4	142.9	583	583	583	197.1	202.4	200.7	1,291	1,291	1,290	204.8	205.1	204.9	
Temperature (in situ)	°C	12.5	12.5	12.5	11.9	11.9	11.9	12.8	12.8	12.8	11.2	11.2	11.2	12.8	12.8	12.8	11.5	11.5	11.5	12.8	12.8	12.8	12.9	12.9	12.9	12.9	12.9	12.9	
Total Dissolved Solids (in situ)	mg/L	127	127	127	221	221	221	127	127	127	273	273	273	114	94	93	379	379	379	128	132	130	839	839	839	133	133	133	
Turbidity (in situ)	NTU	1.98	1.87	1.87	4.11	2.93	3.14	2.85	2.50	2.64	7.61	7.81	7.79	297.85	224.27	322.03	277.87	280.38	279.72	6.33	6.55	6.43	7.90	7.87	7.83	3.01	2.89	3.08	
pH (in situ)	pH units	7.88	7.88	7.87	8.08	8.08	8.09	7.81	7.81	7.81	8.04	8.04	8.05	8.00	8.00	7.99	8.29	8.29	8.29	7.97	7.96	7.98	8.21	8.21	8.21	7.95	7.96	7.96	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	84.4			145			86.7			149			86.1			206			90.7			207			86.9			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			1.6			<1.0			<1.0			<1.0			10.4			<1.0			8.2			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	84.4			147			86.7			149			86.1			216			90.7			216			86.9			
Colour, True	TCU[1]	6.6			<5.0			6.1			118			6.5			11.4			5.6			12.6			6.4			
Dissolved Hardness (as $CaCO_3$)	mg/L	92.6			166			92.0			149			96.4			169			96.7			403			98.4			
Specific Conductivity (lab)	µS/cm	179			310			182			386			185			539			188			1,180			185			
Total Dissolved Solids	mg/L	136			208			108			283			104			365			108			853			124			
Total Suspended Solids	mg/L	4.5			<3.0			<3.0			<3.0			<3.0			24.8			<3.0			<3.0			<3.0			
pH (lab)	pH units	8.02			8.28			8.06			8.24			8.08			8.43			8.10			8.40			8.10			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0073			<0.0050			<0.0050			0.0091			0.0109			0.0157			0.0060			0.0068			<0.0050			EQ
Chloride (Total)	mg/L	<0.50			1.46			<0.50			2.65			<0.50			2.29			<0.50			28.8			<0.50			600
Fluoride (F)	mg/L	0.035			0.065			0.034			0.134			0.036			0.180			0.036			0.224			0.036			EQ
Nitrate (as N)	mg/L	0.0501			0.0054			0.0527			<0.0050			0.0527			0.283			0.0480			0.0679			0.0410			32.8
Nitrite (as N)	mg/L	0.0019			<0.0010			0.0017			<0.0010			0.0015			0.0053			0.0013			<0.0050			0.0013			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			0.0015			0.0041			0.0016			0.0019			0.0016			0.0016			<0.0010			
Phosphorus (P) - Total	mg/L	0.0060			0.0037			0.0100			0.0356			0.0105			0.231			0.0124			0.0167			0.0083			
Phosphorus (P) - Total Dissolved	mg/L	<0.0020			<0.0020			<0.0020			0.0111			<0.0020			0.0256			<0.0020			0.0026			<0.0020			
Silicate (as SiO_2)	mg/L	4.03			2.44			4.15			3.52			4.10			0.79			4.00			1.19			3.82			
Sulfate (SO_4)	mg/L	13.7			26.2			13.6			66.2			14.0			92.4			14.6			427			14.6			
Total Kjeldahl Nitrogen	mg/L	0.114			<0.050			0.104			0.764			0.088			1.01			0.106			0.561			0.102			
Total Nitrogen	mg/L	0.166			<0.050			0.158			0.764			0.142			1.30			0.155			0.629			0.144			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	2.22			0.88			2.78			26.5			2.85			8.00			2.70			12.1			3.45			
Total Organic Carbon	mg/L	2.52			0.57			3.16			28.9			2.64			10.5			2.81			11.9			3.12			
Ion Balance																													
Anion Sum	mEq/L	1.98			3.53			2.02			4.44			2.02			6.33			2.12			14.0			2.04			
Cation - Anion Balance	% difference	1.80			0.570			3.06			0.226			0.498			0.957			2.66			0.358			0.488			
Cation Sum	mEq/L	1.91			3.49			1.90			4.42			2.00			6.21			2.01			13.9			2.06			
Dissolved Metals																													
Calcium (Ca) - Dissolved	mg/L	27.3			46.6			25.6			39.3			27.1			37.2			26.9			92.7			28.0			
Magnesium (Mg) - Dissolved	mg/L	5.93			12.0			6.81			12.3			6.97			18.6			7.18			41.6			6.92			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
[1]True Colour Units.

Table 30. Field measurements, physical tests, anions, nutrients, and organic carbon in water quality samples collected from the Downstream Reach of the Peace River in October 2022.

Date	Units	22-Oct-2022						20-Oct-2022			17-Oct-2022			20-Oct-2022			17-Oct-2022									20-Oct-2022			BC Short-Term Maximum WQG
Site		PD1			PINE			PD2			BEA			PD3			KR			PD4			POUCE			PD5			
Total Depth (m)		2.2			1.0			3.5			0.2			3.1			0.3			6.3			0.1			3.0			
Sample Depth (m)		0.2			0.2			0.2			0.2			0.2			0.3			0.2			0.2			0.2			
Replicate		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
Field Measurements																													
Electrical Conductivity (in situ)	µS/cm	130.4	130.0	130.1	220.5	220.5	220.3	132.2	132.1	132.1	389.1	388.8	389.0	134.3	133.7	133.5	337.2	337.3	337.5	133.6	133.0	133.6	1,016	1,017	1,017	135.3	135.3	135.4	
Oxygen Dissolved (in situ)	mg/L	10.61	10.61	10.61	11.55	11.55	11.55	10.66	10.69	10.71	11.61	11.62	11.61	10.63	10.63	10.64	12.34	12.34	12.34	10.63	10.63	10.63	11.46	11.46	11.46	10.39	10.39	10.39	>5/>9
Oxygen Dissolved (in situ)	%	96.2	96.3	96.2	93.2	93.2	93.2	98.5	98.8	99	99.9	99.9	99.9	97.9	98.1	98.1	100.5	100.6	100.7	97.9	97.9	97.9	94.7	94.6	94.6	95.5	95.4	93.4	
Redox Potential (in situ)	mV	72.7	73.4	73.1	145.8	146.4	146.7	121.3	121.2	121.2	156.6	156.8	157.1	116.3	116.9	117.1	168.9	169.9	170.6	157.0	157.0	157.5	152.4	152.3	152.2	99.7	100.5	101.2	
Salinity (in situ)	ppt	0.08	0.08	0.08	0.17	0.17	0.17	0.08	0.08	0.08	0.28	0.28	0.27	0.09	0.09	0.09	0.25	0.25	0.25	0.09	0.08	0.09	0.78	0.78	0.78	0.09	0.09	0.09	
Specific Conductivity (in situ)	µS/cm	178.1	177.5	177.7	344.7	344.6	344.4	176.8	176.6	176.6	565	565	565	180.1	179.2	178.9	522	521	521	179.5	178.6	179.5	1,554	1,554	1,554	182.1	182.2	182.2	
Temperature (in situ)	°C	11.0	11.0	11.0	6.1	6.1	6.1	11.8	11.8	11.8	8.7	8.7	8.7	11.7	11.7	11.7	6.5	6.5	6.5	11.6	11.6	11.6	6.9	6.9	6.9	11.5	11.5	11.5	
Total Dissolved Solids (in situ)	mg/L	116	115	116	224	224	224	115	115	115	367	367	367	116	116	117	339	339	339	117	116	117	1,010	1,010	1,010	118	118	118	
Turbidity (in situ)	NTU	3.49	6.31	5.36	2.33	2.59	2.90	4.84	4.81	4.90	4.29	4.32	4.24	5.18	5.32	5.40	1.49	1.48	1.52	6.90	6.60	6.74	5.64	5.42	5.49	7.34	10.38	7.57	
pH (in situ)	pH units	8.12	8.11	8.12	8.43	8.39	8.36	8.16	8.17	8.18	8.31	8.31	8.31	8.22	8.20	8.19	8.25	8.23	8.22	7.94	7.94	7.94	8.23	8.23	8.23	8.18	8.17	8.16	6.5 - 9
Physical Tests																													
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	73.8			142			77.2	77.3		185	184		78.5			200			77.3			186			79.2			
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0			7.2			<1.0	<1.0		10.2	10.4		<1.0			11.8			<1.0			6.4			<1.0			
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0			<1.0			<1.0	<1.0		<1.0	<1.0		<1.0			<1.0			<1.0			<1.0			<1.0			
Alkalinity, Total (as $CaCO_3$)	mg/L	73.8			150			77.2	77.3		195	194		78.5			212			77.3			192			79.2			
Colour, True	TCU[1]	6.1			<5.0			6.3	6.3		76.3	70.4		6.0			8.3			6.0			14.7			7.1			
Dissolved Hardness (as $CaCO_3$)	mg/L	95.1			188			86.2	86.9		195	208		88.3			222			88.9			536			90.5			
Specific Conductivity (lab)	µS/cm	183			352			178	179		561	562		184			504			181			1,530			186			
Total Dissolved Solids	mg/L	106			220			111	112		406	385		108			317			106			1,120			112			
Total Suspended Solids	mg/L	<3.0			<3.0			10.2	12.6		<3.0	<3.0		10.6			<3.0			7.0			4.4			13.4			
pH (lab)	pH units	8.17			8.43			8.18	8.20		8.46	8.46		8.21			8.46			8.12			8.33			8.20			6.5 - 9
Anions and Nutrients																													
Ammonia, Total (as N)	mg/L	0.0120			<0.0050			<0.0050	<0.0050		0.0074	0.0082		0.0075			0.0104			<0.0050			0.0112			0.0103			EQ
Chloride (Total)	mg/L	<0.50			1.64			<0.50	<0.50		3.83	3.80		<0.50			1.84			<0.50			36.0			<0.50			600
Fluoride (F)	mg/L	0.040			0.073			0.038	0.037		0.172	0.170		0.037			0.122			0.041			0.252			0.038			EQ
Nitrate (as N)	mg/L	0.0615			<0.0050			0.0610	0.0594		<0.0050	<0.0050		0.0547			0.0915			0.0526			<0.0250			0.0556			32.8
Nitrite (as N)	mg/L	<0.0010			<0.0010			<0.0010	<0.0010		<0.0010	<0.0010		<0.0010			0.0030			<0.0010			<0.0050			<0.0010			
Orthophosphate - Dissolved (as P)	mg/L	<0.0010			<0.0010			<0.0010	<0.0010		0.0016	0.0022		<0.0010			<0.0010			<0.0010			<0.0010			<0.0010			
Phosphorus (P) - Total	mg/L	0.0084			0.0040			0.0156	0.0212		0.0220	0.0219		0.0238			0.0034			0.0260			0.0176			0.0188			
Phosphorus (P) - Total Dissolved	mg/L	0.0023			<0.0020			<0.0020	<0.0020		0.0042	0.0048		<0.0020			0.0092			<0.0020			0.0047			<0.0020			
Silicate (as SiO_2)	mg/L	4.06			2.59			4.18	4.15		0.85	0.84		4.09			<0.50			4.08			0.82			4.07			
Sulfate (SO_4)	mg/L	12.9			28.5			13.0	12.9		105	106		13.0			66.5			13.7			625			13.4			
Total Kjeldahl Nitrogen	mg/L	0.132			0.082			0.114	0.110		0.573	0.568		0.100			0.270			0.109			0.650			0.136			
Total Nitrogen	mg/L	0.193			0.082			0.175	0.169		0.573	0.568		0.155			0.364			0.162			0.650			0.192			
Organic / Inorganic Carbon																													
Dissolved Organic Carbon	mg/L	2.57			1.28			3.06	2.86		21.0	22.5		2.93			6.88			2.93			14.2			3.53			
Total Organic Carbon	mg/L	2.90			1.50			3.01	3.11		22.0	23.3		3.24			6.91			2.94			15.0			3.66			
Ion Balance																													
Anion Sum	mEq/L	1.75			3.64			1.82	1.82		6.20	6.20		1.84			5.69			1.84			17.9			1.87			
Cation - Anion Balance	% difference	5.66			4.46			1.11	0.83		0.800	3.12		0.55			1.56			<0.010			0.845			0.27			
Cation Sum	mEq/L	1.96			3.98			1.78	1.79		6.30	6.60		1.82			5.87			1.84			17.6			1.88			

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages.
[1]True Colour Units.

Table 31. Dissolved metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in October 2022.

Date	22-Oct-2022		20-Oct-2022		17-Oct-2022		20-Oct-2022	17-Oct-2022			20-Oct-2022	BC Short-Term Maximum WQG
Site	PD1	PINE	PD2		BEA		PD3	KR	PD4	POUCE	PD5	
Total Depth (m)	2.2	1.0	3.5		0.2		3.1	0.3	6.3	0.1	3.0	
Sample Depth (m)	0.2	0.2	0.2		0.2		0.2	0.3	0.2	0.2	0.2	
Replicate	A	A	A	B	A	B	A	A	A	A	A	
Dissolved Metals (mg/L)												
Aluminum (Al) - Dissolved	0.0045	0.0038	0.0042	0.0075	0.0065	0.0069	0.0058	0.0017	0.0040	0.0025	0.0043	
Antimony (Sb) - Dissolved	<0.00010	<0.00010	0.00013	0.00011	0.00013	0.00014	<0.00010	0.00015	<0.00010	0.00017	<0.00010	
Arsenic (As) - Dissolved	0.00019	0.00012	0.00018	0.00020	0.00054	0.00056	0.00018	0.00051	0.00020	0.00058	0.00020	
Barium (Ba) - Dissolved	0.0304	0.115	0.0323	0.0312	0.0883	0.0893	0.0321	0.149	0.0349	0.0679	0.0366	
Beryllium (Be) - Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Dissolved	<0.010	0.012	<0.010	<0.010	0.046	0.048	<0.010	0.027	<0.010	0.139	<0.010	
Cadmium (Cd) - Dissolved	0.0000070	<0.0000050	0.0000076	0.0000068	0.0000080	0.0000119	0.0000061	<0.0000050	<0.0000050	<0.0000050	0.0000057	EQ
Calcium (Ca) - Dissolved	27.5	51.9	25.3	25.7	52.2	57.3	25.9	51.6	25.8	126	25.9	
Cesium (Cs) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Chromium (Cr) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	0.00021	0.00023	<0.00010	<0.00010	<0.00010	0.00023	<0.00010	
Copper (Cu) - Dissolved	0.00062	0.00031	0.00058	0.00061	0.00161	0.00165	0.00058	0.00119	0.00058	0.00153	0.00061	EQ
Ferrous Iron (Fe(II)) - Dissolved	<0.020	<0.020	<0.020	<0.020	0.046	0.061	<0.020	<0.020	<0.020	<0.020	<0.020	
Iron (Fe) - Dissolved	<0.010	<0.010	<0.010	<0.010	0.046	0.066	<0.010	<0.010	<0.010	<0.010	<0.010	0.35
Lead (Pb) - Dissolved	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li) - Dissolved	0.0011	0.0080	0.0012	0.0012	0.0085	0.0091	0.0013	0.0069	0.0012	0.0291	0.0013	
Magnesium (Mg) - Dissolved	6.43	14.2	5.58	5.53	15.8	15.9	5.73	22.7	5.95	53.9	6.28	
Manganese (Mn) - Dissolved	0.00070	0.00140	0.00075	0.00091	0.0150	0.0159	0.00067	0.00283	0.00094	0.0180	0.00067	
Mercury (Hg) - Dissolved	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.00000212	0.00000279	<0.00000050	0.0000008	0.00000141	0.00000249	<0.00000050	
Methylmercury (MeHg) - Dissolved	<0.000000020	<0.000000020	<0.000000020	<0.000000020	0.000000125	0.000000132	<0.000000020	<0.000000040	<0.000000020	<0.000000020	<0.000000020	
Molybdenum (Mo) - Dissolved	0.000765	0.000932	0.000792	0.000761	0.00106	0.00106	0.000799	0.00128	0.000796	0.00146	0.000778	
Nickel (Ni) - Dissolved	0.00066	<0.00050	0.00058	0.00059	0.00352	0.00366	0.00059	0.00146	0.00067	0.00571	0.00065	
Phosphorus (P) - Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Dissolved	0.447	0.672	0.431	0.421	2.28	2.43	0.422	2.21	0.435	9.82	0.440	
Rubidium (Rb) - Dissolved	0.00034	0.00032	0.00026	0.00030	0.00090	0.00102	0.00028	0.00061	0.00029	0.00218	0.00024	
Selenium (Se) - Dissolved	0.000286	0.000446	0.000256	0.000251	0.000323	0.000347	0.000247	0.000243	0.000263	0.000582	0.000253	
Silicon (Si) - Dissolved	1.95	1.20	1.87	1.87	0.312	0.331	1.88	<0.050	1.80	0.351	1.90	
Silver (Ag) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na) - Dissolved	1.18	4.62	1.07	1.06	53.7	54.4	1.14	31.5	1.18	153	1.32	
Strontium (Sr) - Dissolved	0.109	0.204	0.103	0.104	0.229	0.220	0.106	0.323	0.110	0.596	0.105	
Sulfur (S) - Dissolved	4.60	10.3	4.46	4.53	36.3	35.9	4.69	23.2	4.27	225	4.62	
Tellurium (Te) - Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000012	<0.000010	
Thorium (Th) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Tungsten (W) - Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Dissolved	0.000400	0.000414	0.000422	0.000427	0.00172	0.00165	0.000441	0.00115	0.000402	0.00298	0.000390	
Vanadium (V) - Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn) - Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	EQ[1]
Zirconium (Zr) - Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.
[1] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 32. Total metals concentrations in water quality samples collected from the Downstream Reach of the Peace River in October 2022.

Date	22-Oct-2022		20-Oct-2022		17-Oct-2022		20-Oct-2022	17-Oct-2022			20-Oct-2022	BC Short-Term Maximum WQG
Site	PD1	PINE	PD2		BEA		PD3	KR	PD4	POUCE	PD5	
Total Depth (m)	2.2	1.0	3.5		0.2		3.1	0.3	6.3	0.1	3.0	
Sample Depth (m)	0.2	0.2	0.2		0.2		0.2	0.3	0.2	0.2	0.2	
Replicate	A	A	A	B	A	B	A	A	A	A	A	
Total Metals (mg/L)												
Aluminum (Al) - Total	0.0887	0.0499	0.155	0.146	0.110	0.105	0.138	0.0508	0.230	0.152	0.194	
Antimony (Sb) - Total	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	0.00014	<0.00010	0.00015	<0.00010	0.00017	<0.00010	
Arsenic (As) - Total	0.00028	0.00020	0.00032	0.00032	0.00085	0.00082	0.00026	0.00059	0.00039	0.00071	0.00036	
Barium (Ba) - Total	0.0373	0.129	0.0368	0.0364	0.0972	0.0978	0.0370	0.157	0.0424	0.0743	0.0414	
Beryllium (Be) - Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000022	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi) - Total	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B) - Total	<0.010	0.012	<0.010	<0.010	0.054	0.054	<0.010	0.032	<0.010	0.162	<0.010	1.2
Cadmium (Cd) - Total	0.0000211	0.0000084	0.0000239	0.0000239	0.0000285	0.0000312	0.0000188	<0.0000050	0.0000294	0.0000109	0.0000257	
Calcium (Ca) - Total	28.1	53.0	26.5	26.2	55.8	56.9	27.2	55.3	28.0	136	27.3	
Cesium (Cs) - Total	0.000017	<0.000010	0.000038	0.000042	0.000018	0.000017	0.000034	0.000012	0.000053	0.000030	0.000053	
Chromium (Cr) - Total	<0.00050	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Cobalt (Co) - Total	<0.00010	<0.00010	0.00012	0.00012	0.00028	0.00028	0.00011	<0.00010	0.00018	0.00034	0.00017	0.11
Copper (Cu) - Total	0.00081	<0.00050	0.00094	0.00098	0.00202	0.00197	0.00091	0.00142	0.00106	0.00190	0.00102	
Iron (Fe) - Total	0.104	0.091	0.256	0.271	0.749	0.701	0.228	0.063	0.443	0.237	0.353	1
Lead (Pb) - Total	0.000058	<0.000050	0.000140	0.000150	0.000160	0.000156	0.000123	<0.000050	0.000199	0.000117	0.000197	EQ
Lithium (Li) - Total	0.0014	0.0088	0.0014	0.0014	0.0089	0.0090	0.0015	0.0076	0.0015	0.0310	0.0016	
Magnesium (Mg) - Total	6.78	14.5	6.18	6.11	17.1	16.5	6.32	23.5	6.57	57.5	6.34	
Manganese (Mn) - Total	0.00412	0.00268	0.00710	0.00726	0.0577	0.0562	0.00676	0.00518	0.0105	0.109	0.00915	EQ
Mercury (Hg) - Total	<0.00000050	<0.00000050	<0.00000050	<0.00000050	0.00000353	0.00000326	<0.00000050	0.00000136	0.00000258	0.00000188	0.00000056	
Methylmercury (MeHg) - Total	<0.000000020	<0.000000020	<0.000000020	0.000000023	0.000000074	0.000000130	0.000000065	<0.000000080	<0.000000020	0.000000038	0.000000148	
Molybdenum (Mo) - Total	0.000863	0.00106	0.000825	0.000830	0.00112	0.00114	0.000864	0.00139	0.000827	0.00153	0.000858	46
Nickel (Ni) - Total	0.00095	0.00064	0.00101	0.00105	0.00406	0.00401	0.00093	0.00165	0.00125	0.00644	0.00108	
Phosphorus (P) - Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium (K) - Total	0.508	0.705	0.477	0.487	2.39	2.35	0.466	2.26	0.539	10.7	0.499	
Rubidium (Rb) - Total	0.00053	0.00038	0.00072	0.00067	0.00108	0.00111	0.00066	0.00068	0.00083	0.00243	0.00082	
Selenium (Se) - Total	0.000240	0.000374	0.000307	0.000286	0.000369	0.000314	0.000252	0.000178	0.000305	0.000582	0.000264	
Silicon (Si) - Total	2.09	1.34	2.09	2.13	0.55	0.57	2.05	0.18	2.36	0.80	2.30	
Silver (Ag) - Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	EQ
Sodium (Na) - Total	1.24	4.58	1.08	1.07	53.4	52.8	1.14	31.6	1.27	158	1.29	
Strontium (Sr) - Total	0.110	0.206	0.104	0.105	0.227	0.229	0.105	0.332	0.108	0.660	0.114	
Sulfur (S) - Total	5.01	11.2	3.86	4.23	38.0	38.1	4.45	24.5	4.69	242	4.70	
Tellurium (Te) - Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl) - Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	
Thorium (Th) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti) - Total	0.00161	0.00080	0.00293	0.00225	0.00527	0.00528	<0.00300	0.00145	0.00403	<0.00390	<0.00360	
Tungsten (W) - Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium (U) - Total	0.000448	0.000444	0.000458	0.000474	0.00166	0.00167	0.000483	0.00123	0.000436	0.00303	0.000478	
Vanadium (V) - Total	0.00084	<0.00050	0.00089	0.00089	0.00074	0.00067	0.00078	<0.00050	0.00147	0.00062	0.00108	
Zinc (Zn) - Total	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	EQ
Zirconium (Zr) - Total	<0.00020	<0.00020	<0.00020	<0.00020	0.00043	<0.00060	<0.00020	<0.00020	<0.00020	0.00028	<0.00020	

No exceedances occurred of short-term (maximum) BC Water Quality Guideline (BC Short-Term Maximum WQG) (BC ENV 2021a).
EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable.

3. 2022 WATER QUALITY DATA SUMMARY STATISTICS

Table 33. 2022 annual water quality data summary statistics for field measurements, physical tests, anions, nutrients, organic carbon, and chlorophyll-*a* at the Williston and Dinosaur reservoirs.

Parameter	Units	Min MDL	Upstream Reservoirs								BC Short-Term Maximum WQG[1]
			n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Field Measurements											
Electrical Conductivity (in situ)	µS/cm	N/A	72		137.0	139.8	110.4	160.1	13.7		
Oxygen Dissolved (in situ)	%	N/A	60		95	94.0	90.2	107.6	5		
Oxygen Dissolved (in situ)	mg/L	N/A	72		10	10.0	9.03	11.96	1	0	>5/>9
Redox Potential (in situ)	mV	N/A	72		146	145.7	95.4	200.1	29		
Salinity (in situ)	ppt	N/A	72		0.09	0.09	0.08	0.09	0.00		
Specific Conductivity (in situ)	µS/cm	N/A	72		182.2	184.1	169.1	191.4	6.1		
Temperature (in situ)	°C	N/A	72		12	12.6	4.7	17.2	4		
Total Dissolved Solids (in situ)	mg/L	N/A	72		118	120	110	124	4		
Turbidity (in situ)	NTU	N/A	72		4	0.94	-0.06	34.93	8		
pH (in situ)	pH units	N/A	72		7.87	7.86	7.60	8.25	0.16	0	6.5 - 9
Physical Tests											
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	1.0	24	0	86	84	74.8	111	9		
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	1.0	24	24	1.0	1.0	1.0	1.0	0		
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	1.0	24	24	1.0	1.0	1.0	1.0	0		
Alkalinity, Total (as $CaCO_3$)	mg/L	1.0	24	0	86	84	74.8	111	9		
Colour, True	TCU[2]	5.0	24	0	7.9	7.2	5.1	13.5	2.4		
Dissolved Hardness (as $CaCO_3$)	mg/L	0.50	24	0	91.7	91.8	84.2	96.0	2.6		
Specific Conductivity (lab)	µS/cm	2.0	24	0	174	174	159	192	11		
Total Dissolved Solids	mg/L	13	24	0	109	109	84	132	12		
Total Suspended Solids	mg/L	3.0	24	19	4.1	3.0	3.0	18.0	3.4		
pH (lab)	pH units	0.10	24	0	8.04	8.04	7.89	8.20	0.09	0	6.5 - 9
Anions and Nutrients											
Ammonia, Total (as N)	mg/L	0.0050	24	11	0.0082	0.0060	0.0050	0.0156	0.0040	0	EQ
Chloride (Total)	mg/L	0.50	24	24	0.50	0.50	0.50	0.50	0		600
Fluoride (F)	mg/L	0.020	24	0	0.034	0.033	0.026	0.046	0.006	0	EQ
Nitrate (as N)	mg/L	0.0050	24	0	0.0608	0.0610	0.0376	0.0833	0.0126	0	32.8
Nitrite (as N)	mg/L	0.0010	24	17	0.0015	0.0010	0.0010	0.0038	0.0009	0	EQ
Orthophosphate - Dissolved (as P)	mg/L	0.0010	24	21	0.0011	0.0010	0.0010	0.0022	0.0003		
Phosphorus (P) - Total	mg/L	0.0020	24	2	0.0073	0.0042	0.0020	0.0478	0.0094		
Phosphorus (P) - Total Dissolved	mg/L	0.0020	24	18	0.0035	0.0020	0.0020	0.0332	0.0063		
Silicate (as SiO_2)	mg/L	0.50	20	0	4.39	4.33	4.16	4.70	0.17		
Sulfate (SO_4)	mg/L	0.30	24	0	13.2	13.2	11.6	15.3	1.2		
Total Kjeldahl Nitrogen	mg/L	0.050	24	2	0.095	0.088	0.050	0.193	0.036		
Total Nitrogen	mg/L	0.030	20	0	0.155	0.153	0.072	0.233	0.039		
Organic Carbon											
Dissolved Organic Carbon	mg/L	0.50	24	0	2.93	2.75	2.30	4.04	0.50		
Total Organic Carbon	mg/L	0.50	24	0	2.90	2.73	2.05	4.11	0.52		
Ion Balance											
Anion Sum	mEq/L	0.10	16	0	1.95	1.90	1.75	2.51	0.20		
Cation - Anion Balance	% difference	0.010	16	0	3.0	2.1	0.261	12.6	3.1		
Cation Sum	mEq/L	0.10	16	0	1.88	1.90	1.74	1.95	0.05		
Plant Pigments											
Chlorophyll-*a*	µg/L	0.010	24	0	1.84	1.76	0.366	5.37	1.15		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns. No exceedances were observed.

[2]True Colour Units.

N/A = not applicable.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 34. 2022 annual water quality data summary statistics for dissolved metal concentrations at the Williston and Dinosaur reservoirs.

Parameter	Min MDL	Upstream Reservoirs								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Dissolved Metals (mg/L)										
Aluminum (Al) - Dissolved	0.0010	8	0	0.0077	0.0044	0.0038	0.0188	0.0063		
Antimony (Sb) - Dissolved	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Arsenic (As) - Dissolved	0.00010	8	0	0.00018	0.00018	0.00016	0.00020	0.00001		
Barium (Ba) - Dissolved	0.00010	8	0	0.0316	0.0297	0.0275	0.0409	0.0047		
Beryllium (Be) - Dissolved	0.000020	8	8	0.000020	0.000020	0.000020	0.000020	0		
Bismuth (Bi) - Dissolved	0.000050	8	8	0.000050	0.000050	0.000050	0.000050	0		
Boron (B) - Dissolved	0.010	8	8	0.010	0.010	0.010	0.010	0		
Cadmium (Cd) - Dissolved	0.0000050	8	0	0.0000108	0.0000093	0.0000070	0.0000160	0.0000039	0	EQ
Calcium (Ca) - Dissolved	0.050	24	0	26.4	26.2	24.2	28.6	1.0		
Cesium (Cs) - Dissolved	0.000010	8	8	0.000010	0.000010	0.000010	0.000010	0		
Chromium (Cr) - Dissolved	0.00050	8	8	0.00050	0.00050	0.00050	0.00050	0		
Cobalt (Co) - Dissolved	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Copper (Cu) - Dissolved	0.00020	8	0	0.00062	0.00061	0.00057	0.00071	0.00004	0	EQ
Ferrous Iron (Fe(II)) - Dissolved	0.020	4	3	0.022	0.020	0.020	0.029	0.004		
Iron (Fe) - Dissolved	0.010	8	6	0.014	0.010	0.010	0.031	0.008	0	0.35
Lead (Pb) - Dissolved	0.000050	8	8	0.000050	0.000050	0.000050	0.000050	0		
Lithium (Li) - Dissolved	0.0010	8	4	0.0011	0.0010	0.0010	0.0013	0.0001		
Magnesium (Mg) - Dissolved	0.0050	24	0	6.24	6.21	5.77	6.79	0.25		
Manganese (Mn) - Dissolved	0.00010	8	0	0.00099	0.00065	0.00018	0.00273	0.00092		
Mercury (Hg) - Dissolved	0.00000050	8	6	0.00000060	0.00000050	0.00000050	0.00000096	0.00000019		
Methylmercury (MeHg) - Dissolved	0.000000020	8	8	0.000000020	0.000000020	0.000000020	0.000000020	0		
Molybdenum (Mo) - Dissolved	0.000050	8	0	0.000742	0.000724	0.000702	0.000816	0.000043		
Nickel (Ni) - Dissolved	0.00050	8	0	0.00072	0.00072	0.00061	0.00087	0.00010		
Phosphorus (P) - Dissolved	0.050	8	8	0.050	0.050	0.050	0.050	0		
Potassium (K) - Dissolved	0.050	12	0	0.438	0.447	0.370	0.522	0.054		
Rubidium (Rb) - Dissolved	0.00020	8	0	0.00029	0.00030	0.00025	0.00031	0.00002		
Selenium (Se) - Dissolved	0.000050	8	0	0.000283	0.000278	0.000244	0.000353	0.000035		
Silicon (Si) - Dissolved	0.050	8	0	2.19	2.19	2.04	2.33	0.11		
Silver (Ag) - Dissolved	0.000010	8	8	0.000010	0.000010	0.000010	0.000010	0		
Sodium (Na) - Dissolved	0.050	12	0	1.13	1.11	0.985	1.39	0.13		
Strontium (Sr) - Dissolved	0.00020	8	0	0.106	0.107	0.101	0.112	0.004		
Sulfur (S) - Dissolved	0.50	8	0	4.29	4.26	3.48	5.04	0.65		
Tellurium (Te) - Dissolved	0.00020	8	8	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Dissolved	0.000010	8	8	0.000010	0.000010	0.000010	0.000010	0		
Thorium (Th) - Dissolved	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Tin (Sn) - Dissolved	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Dissolved	0.00030	8	7	0.00030	0.00030	0.00030	0.00031	0.00000		
Tungsten (W) - Dissolved	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Dissolved	0.000010	8	0	0.000436	0.000436	0.000393	0.000477	0.000037		
Vanadium (V) - Dissolved	0.00050	8	8	0.00050	0.00050	0.00050	0.00050	0		
Zinc (Zn) - Dissolved	0.0010	8	8	0.0010	0.0010	0.0010	0.0010	0		EQ[2]
Zirconium (Zr) - Dissolved	0.00030	8	8	0.00030	0.00030	0.00030	0.00030	0		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns. No exceedances were observed.

[2] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 35. 2022 annual water quality data summary statistics for total metal concentrations at the Williston and Dinosaur reservoirs.

Parameter	Min MDL	Upstream Reservoirs								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Total Metals (mg/L)										
Aluminum (Al) - Total	0.0030	8	0	0.076	0.020	0.0135	0.333	0.116		
Antimony (Sb) - Total	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Arsenic (As) - Total	0.00010	8	0	0.00024	0.00020	0.00019	0.00035	0.00007		
Barium (Ba) - Total	0.00010	8	0	0.0372	0.0299	0.0280	0.0644	0.0147		
Beryllium (Be) - Total	0.000020	8	6	0.000020	0.000020	0.000020	0.000022	0.000001		
Bismuth (Bi) - Total	0.000050	8	8	0.000050	0.000050	0.000050	0.000050	0		
Boron (B) - Total	0.010	8	8	0.010	0.010	0.010	0.010	0		1.2
Cadmium (Cd) - Total	0.0000050	8	0	0.0000235	0.0000168	0.0000110	0.0000534	0.0000164		
Calcium (Ca) - Total	0.050	8	0	28.2	28.1	27.6	29.2	0.5		
Cesium (Cs) - Total	0.000010	8	6	0.000020	0.000010	0.000010	0.000066	0.000021		
Chromium (Cr) - Total	0.00050	8	7	0.00053	0.00050	0.00050	0.00071	0.00007		
Cobalt (Co) - Total	0.00010	8	6	0.00014	0.00010	0.00010	0.00028	0.00007	0	0.11
Copper (Cu) - Total	0.00050	8	0	0.00082	0.00068	0.00063	0.00135	0.00028		
Iron (Fe) - Total	0.010	8	0	0.111	0.023	0.014	0.399	0.171	0	1
Lead (Pb) - Total	0.000050	8	6	0.000140	0.000050	0.000050	0.000460	0.000170	0	EQ
Lithium (Li) - Total	0.0010	8	0	0.0014	0.0013	0.0012	0.0016	0.0002		
Magnesium (Mg) - Total	0.0050	8	0	6.19	6.19	6.02	6.40	0.14		
Manganese (Mn) - Total	0.00010	8	0	0.0041	0.0018	0.00127	0.0132	0.0046	0	EQ
Mercury (Hg) - Total	0.00000050	8	4	0.00000116	0.00000050	0.00000050	0.00000374	0.00000125		
Methylmercury (MeHg) - Total	0.000000020	8	5	0.000000025	0.000000020	0.000000020	0.000000038	0.000000008		
Molybdenum (Mo) - Total	0.000050	8	0	0.000717	0.000766	0.000417	0.000841	0.000144	0	46
Nickel (Ni) - Total	0.00050	8	0	0.00099	0.00078	0.00069	0.00192	0.00046		
Phosphorus (P) - Total	0.0020	8	8	0.050	0.050	0.050	0.050	0		
Potassium (K) - Total	0.050	8	0	0.459	0.439	0.418	0.549	0.047		
Rubidium (Rb) - Total	0.00020	8	0	0.00043	0.00031	0.00026	0.00095	0.00025		
Selenium (Se) - Total	0.000050	8	0	0.000268	0.000259	0.000211	0.000344	0.000043		
Silicon (Si) - Total	0.10	8	0	2.32	2.23	2.06	2.95	0.30		
Silver (Ag) - Total	0.000010	8	8	0.000018	0.000015	0.000010	0.000030	0.000009	0	EQ
Sodium (Na) - Total	0.050	8	0	1.07	1.06	1.01	1.20	0.07		
Strontium (Sr) - Total	0.00020	8	0	0.114	0.114	0.104	0.124	0.009		
Sulfur (S) - Total	0.50	8	0	4.78	4.77	4.54	4.96	0.15		
Tellurium (Te) - Total	0.00020	8	8	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Total	0.000010	8	8	0.000010	0.000010	0.000010	0.000010	0		
Thorium (Th) - Total	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Tin (Sn) - Total	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Total	0.00030	8	4	0.00156	0.00054	0.00030	0.00810	0.00267		
Tungsten (W) - Total	0.00010	8	8	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Total	0.000010	8	0	0.000452	0.000448	0.000400	0.000514	0.000049		
Vanadium (V) - Total	0.00050	8	6	0.00069	0.00050	0.00050	0.00150	0.00037		
Zinc (Zn) - Total	0.0030	8	8	0.0030	0.0030	0.0030	0.0030	0	0	EQ
Zirconium (Zr) - Total	0.00020	8	7	0.00022	0.00020	0.00020	0.00040	0.00007		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns. No exceedances were observed.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 36. 2022 annual water quality data summary statistics for field measurements, physical tests, anions, nutrients, and organic carbon at the Peace River and tributary sites within the Site C Reservoir Reach.

Parameter	Units	Min MDL	Peace River							Tributaries							BC Short-Term Maximum WQG[1]
			n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Field Measurements																			
Electrical Conductivity (in situ)	µS/cm	N/A	69		136	140.2	111.3	153.4	12		36		269.2	265.6	160.3	408.7	73.8		
Oxygen Dissolved (in situ)	%	N/A	57		96	94.2	91.3	102.9	3		30		96.0	95.9	94.3	98.0	1.1		
Oxygen Dissolved (in situ)	mg/L	N/A	68		11	10.4	9.81	12.05	1	0	36		9.8	9.6	8.12	11.8	1.3	12[2]	>5/>9
Redox Potential (in situ)	mV	N/A	69		129	126	82.1	215	26		36		134	139.2	81.5	177.6	27		
Salinity (in situ)	ppt	N/A	69		0.1	0.09,0.1	0.08	0.10	0.0		36		0.2	0.16	0.09	0.23	0.0		
Specific Conductivity (in situ)	µS/cm	N/A	69		187	185.6	170.1	216.3	11		36		341.8	344.6	189.3	467.1	98.8		
Temperature (in situ)	degC	N/A	69		10.8	11.7	5.4	13.1	2.3		36		15	14.1	6.5	24.0	6		
Total Dissolved Solids (in situ)	mg/L	N/A	69		121	121	110	141	7		36		222	224	123	304	64		
Turbidity (in situ)	NTU	N/A	69		16.6	2.5	0.32	112.7	28.9		36		118.19	18.88	1.56	572.35	186.45		
pH (in situ)	pH units	N/A	69		7.89	7.87	7.61	8.32	0.16	0	36		8.2	8.14	7.8	8.61	0.2	0	6.5 - 9
Physical Tests																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	1.0	27	0	85	82	71.0	105	10		14	0	155	158	105	203	30		
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	1.0	27	27	1.0	1.0	1.0	1.0	0		14	5	6.4	4.5	1.0	15.8	5.8		
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	1.0	27	27	1.0	1.0	1.0	1.0	0		14	14	1.0	1.0	1.0	1.0	0		
Alkalinity, Total (as $CaCO_3$)	mg/L	1.0	27	0	85	82	71.0	105	10		14	0	162	163	105	203	34		
Colour, True	TCU[3]	5.0	24	0	9.3	6.8	5.5	24.2	5.2		10	3	12.8	5.7	5.0	38.8	13.7		
Dissolved Hardness (as $CaCO_3$)	mg/L	0.50	27	0	94	94	81.2	123	8		14	0	178	173	99.8	243	50		
Specific Conductivity (lab)	µS/cm	2.0	27	0	185	185	169	235	14		14	0	338	330	186	470	93		
Total Dissolved Solids	mg/L	13	27	0	126	124	97	208	22		14	0	243	244	174	300	40		
Total Suspended Solids	mg/L	3.0	27	13	19	6	3.0	130	33		14	6	200	11	3.0	1,200	377		
pH (lab)	pH units	0.10	27	0	7.93	8.05	7.23	8.16	0.30	0	14	0	8.22	8.34	7.29	8.54	0.33	0	6.5 - 9
Anions and Nutrients																			
Ammonia, Total (as N)	mg/L	0.0050	27	11	0.0078	0.0057	0.0050	0.0231	0.0045	0	14	8	0.0120	0.0050	0.0050	0.0334	0.0103	0	EQ
Chloride (Total)	mg/L	0.50	27	27	0.50	0.50	0.50	0.50	0	0	14	10	0.55	0.50	0.50	0.83	0.10	0	600
Fluoride (F)	mg/L	0.020	27	0	0.038	0.037	0.032	0.063	0.006	0	14	0	0.085	0.088	0.056	0.107	0.015	0	EQ
Nitrate (as N)	mg/L	0.0050	27	0	0.0688	0.0651	0.0561	0.0899	0.0097	0	14	6	0.0152	0.0058	0.0050	0.0719	0.0184	0	32.8
Nitrite (as N)	mg/L	0.0010	27	16	0.0015	0.0010	0.0010	0.0030	0.0007		14	13	0.0010	0.0010	0.0010	0.0012	0.0001		
Orthophosphate - Dissolved (as P)	mg/L	0.0010	27	19	0.0014	0.0010	0.0010	0.0043	0.0008		13	6	0.0021	0.0011	0.0010	0.0066	0.0018		
Phosphorus (P) - Total	mg/L	0.0020	27	0	0.029	0.009	0.0032	0.170	0.043		14	0	0.23	0.03	0.0048	1.25	0.40		
Phosphorus (P) - Total Dissolved	mg/L	0.0020	27	18	0.0026	0.0020	0.0020	0.0058	0.0010		14	6	0.0043	0.0023	0.0020	0.0095	0.0030		
Silicate (as SiO_2)	mg/L	0.50	21	0	4.38	4.38	4.11	4.73	0.17		12	0	3.67	3.71	3.08	4.69	0.40		
Sulfate (SO_4)	mg/L	0.30	27	0	13.8	13.2	11.8	21.4	2.0		14	0	31.9	30.4	8.26	57.7	17.6		
Total Kjeldahl Nitrogen	mg/L	0.050	27	0	0.117	0.092	0.074	0.320	0.054		14	0	0.35	0.15	0.073	1.52	0.40		
Total Nitrogen	mg/L	0.030	27	0	0.188	0.172	0.140	0.381	0.053		14	0	0.36	0.15	0.073	1.54	0.42		
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	0.50	27	0	3.23	3.12	2.43	6.13	0.78		14	0	5.16	4.57	2.27	9.05	2.52		
Total Organic Carbon	mg/L	0.50	27	0	3.37	2.97	2.54	7.86	1.18		14	0	6.2	4.5	1.92	24.0	5.6		
Ion Balance																			
Anion Sum	mEq/L	0.10	17	0	1.90	1.89	1.67	2.29	0.16		10	0	4.10	4.29	2.41	5.03	0.93		
Cation - Anion Balance	% difference	0.010	17	3	1.86	1.71	-1.34	5.54	1.88		10	0	2.40	1.80	0.299	6.87	2.17		
Cation Sum	mEq/L	0.10	17	0	1.89	1.86	1.68	2.25	0.14		10	0	3.97	4.09	2.10	5.00	0.96		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns and is highlighted in grey if there are any exceedances.

[2]Only the BC WQG-AL (Buried embryo/alevin) was exceeded.

[3]True Colour Units.

N/A = not applicable.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 37. 2022 annual water quality data summary statistics for dissolved metal concentrations at the Peace River and tributary sites within the Site C Reservoir Reach.

Parameter	Min MDL	Peace River								Tributaries								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Dissolved Metals (mg/L)																		
Aluminum (Al) - Dissolved	0.0010	10	0	0.0182	0.0231	0.0040	0.0315	0.0122		4	0	0.0147	0.0135	0.0020	0.0298	0.0123		
Antimony (Sb) - Dissolved	0.00010	10	9	0.00010	0.00010	0.00010	0.00012	0.00001		4	0	0.00014	0.00014	0.00011	0.00018	0.00003		
Arsenic (As) - Dissolved	0.00010	10	0	0.00019	0.00020	0.00016	0.00021	0.00002		4	0	0.00026	0.00025	0.00014	0.00040	0.00011		
Barium (Ba) - Dissolved	0.00010	10	0	0.0383	0.0411	0.0291	0.0513	0.0079		4	0	0.108	0.093	0.0646	0.182	0.052		
Beryllium (Be) - Dissolved	0.000020	10	10	0.000020	0.000020	0.000020	0.000020	0		4	4	0.000020	0.000020	0.000020	0.000020	0		
Bismuth (Bi) - Dissolved	0.000050	10	10	0.000050	0.000050	0.000050	0.000050	0		4	4	0.000050	0.000050	0.000050	0.000050	0		
Boron (B) - Dissolved	0.010	10	10	0.010	0.010	0.010	0.010	0		4	3	0.011	0.010	0.010	0.013	0.001		
Cadmium (Cd) - Dissolved	0.0000050	10	0	0.0000108	0.0000116	0.0000056	0.0000162	0.0000034	0	4	0	0.0000123	0.0000106	0.0000055	0.0000226	0.0000081	0	EQ
Calcium (Ca) - Dissolved	0.050	27	0	27.0	26.7	23.6	34.6	2.2		14	0	48.5	47.9	26.5	65.0	13.3		
Cesium (Cs) - Dissolved	0.000010	10	10	0.000010	0.000010	0.000010	0.000010	0		4	4	0.000010	0.000010	0.000010	0.000010	0		
Chromium (Cr) - Dissolved	0.00050	10	10	0.00050	0.00050	0.00050	0.00050	0		4	4	0.00050	0.00050	0.00050	0.00050	0		
Cobalt (Co) - Dissolved	0.00010	10	9	0.00010	0.00010	0.00010	0.00012	0.00001		4	1	0.00017	0.00017	0.00010	0.00024	0.00006		
Copper (Cu) - Dissolved	0.00020	10	0	0.00075	0.00074	0.00056	0.00118	0.00020	0	4	0	0.00089	0.00088	0.00033	0.00148	0.00060	0	EQ
Ferrous Iron (Fe(II)) - Dissolved	0.020	4	4	0.020	0.020	0.020	0.020	0		2	2	0.020	0.020	0.020	0.020	0		
Iron (Fe) - Dissolved	0.010	10	4	0.027	0.034	0.010	0.044	0.015	0	4	2	0.033	0.028	0.010	0.064	0.027	0	0.35
Lead (Pb) - Dissolved	0.000050	10	10	0.000050	0.000050	0.000050	0.000050	0		4	3	0.000051	0.000050	0.000050	0.000054	0.000002		
Lithium (Li) - Dissolved	0.0010	10	3	0.0015	0.0015	0.0010	0.0033	0.0007		4	0	0.0057	0.0059	0.0040	0.0070	0.0013		
Magnesium (Mg) - Dissolved	0.0050	27	0	6.41	6.32	5.42	8.83	0.69		14	0	14.0	13.3	8.17	19.5	4.0		
Manganese (Mn) - Dissolved	0.00010	10	0	0.00241	0.00292	0.00038	0.00584	0.00191		4	0	0.0136	0.0100	0.00249	0.0320	0.0130		
Mercury (Hg) - Dissolved	0.00000050	10	3	0.00000099	0.00000100	0.00000050	0.00000176	0.00000043		4	1	0.00000131	0.00000148	0.00000050	0.00000179	0.00000056		
Methylmercury (MeHg) - Dissolved	0.000000020	10	8	0.000000022	0.000000020	0.000000020	0.000000034	0.000000004		4	3	0.000000023	0.000000020	0.000000020	0.000000034	0.000000007		
Molybdenum (Mo) - Dissolved	0.000050	10	0	0.00077	0.00072	0.000683	0.00129	0.00018		4	0	0.00193	0.00172	0.000615	0.00368	0.00143		
Nickel (Ni) - Dissolved	0.00050	10	0	0.00095	0.00104	0.00061	0.00154	0.00032		4	0	0.00161	0.00164	0.00083	0.00234	0.00069		
Phosphorus (P) - Dissolved	0.050	13	13	0.050	0.050	0.050	0.050	0		6	6	0.050	0.050	0.050	0.050	0		
Potassium (K) - Dissolved	0.050	10	0	0.483	0.483	0.406	0.651	0.082		5	0	0.92	0.86	0.660	1.19	0.25		
Rubidium (Rb) - Dissolved	0.00020	10	0	0.00031	0.00030	0.00025	0.00035	0.00003		4	0	0.00033	0.00034	0.00027	0.00037	0.00004		
Selenium (Se) - Dissolved	0.000050	10	0	0.000287	0.000267	0.000187	0.000530	0.000097		4	0	0.00070	0.00069	0.000219	0.00122	0.00055		
Silicon (Si) - Dissolved	0.050	10	0	2.13	2.20	1.93	2.27	0.14		4	0	1.90	1.82	1.70	2.26	0.26		
Silver (Ag) - Dissolved	0.000010	10	10	0.000010	0.000010	0.000010	0.000010	0		4	4	0.000010	0.000010	0.000010	0.000010	0		
Sodium (Na) - Dissolved	0.050	13	0	1.25	1.22	0.954	2.00	0.28		7	0	3.21	2.00	1.80	8.85	2.55		
Strontium (Sr) - Dissolved	0.00020	10	0	0.108	0.107	0.0936	0.140	0.014		4	0	0.200	0.194	0.0844	0.330	0.103		
Sulfur (S) - Dissolved	0.50	10	0	4.84	4.80	3.93	6.97	0.91		4	0	12.1	11.7	4.55	20.5	6.5		
Tellurium (Te) - Dissolved	0.00020	10	10	0.00020	0.00020	0.00020	0.00020	0		4	4	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Dissolved	0.000010	10	10	0.000010	0.000010	0.000010	0.000010	0		4	4	0.000010	0.000010	0.000010	0.000010	0		
Thorium (Th) - Dissolved	0.00010	10	10	0.00010	0.00010	0.00010	0.00010	0		4	4	0.00010	0.00010	0.00010	0.00010	0		
Tin (Sn) - Dissolved	0.00010	10	10	0.00010	0.00010	0.00010	0.00010	0		4	4	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Dissolved	0.00030	10	4	0.00056	0.00056	0.00030	0.00096	0.00026		4	2	0.00052	0.00031	0.00030	0.00118	0.00044		
Tungsten (W) - Dissolved	0.00010	10	10	0.00010	0.00010	0.00010	0.00010	0		4	4	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Dissolved	0.000010	10	0	0.000462	0.000496	0.000382	0.000535	0.000060		4	0	0.000662	0.000713	0.000461	0.000763	0.000142		
Vanadium (V) - Dissolved	0.00050	10	9	0.00050	0.00050	0.00050	0.00053	0.00001		4	4	0.00050	0.00050	0.00050	0.00050	0		
Zinc (Zn) - Dissolved	0.0010	10	10	0.0010	0.0010	0.0010	0.0010	0		4	4	0.0010	0.0010	0.0010	0.0010	0		EQ[2]
Zirconium (Zr) - Dissolved	0.00030	10	10	0.00030	0.00030	0.00030	0.00030	0		4	4	0.00030	0.00030	0.00030	0.00030	0		

[1] EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns. No exceedances were observed. Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

[2] Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 38. 2022 annual water quality data summary statistics for total metal concentrations at the Peace River and tributary sites within the Site C Reservoir Reach.

Parameter	Min MDL	Peace River								Tributaries								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Total Metals (mg/L)																		
Aluminum (Al) - Total	0.0030	10	0	0.83	0.74	0.0355	2.73	0.96		4	0	3.30	1.72	0.0447	9.73	4.52		
Antimony (Sb) - Total	0.00010	10	5	0.00013	0.00010	0.00010	0.00026	0.00006		4	1	0.00029	0.00028	0.00010	0.00048	0.00018		
Arsenic (As) - Total	0.00010	10	0	0.00074	0.00064	0.00020	0.00208	0.00066		4	0	0.00294	0.00166	0.00025	0.00816	0.00372		
Barium (Ba) - Total	0.00010	10	0	0.070	0.078	0.0304	0.143	0.039		4	0	0.292	0.218	0.121	0.610	0.218		
Beryllium (Be) - Total	0.000020	10	4	0.000058	0.000048	0.000020	0.000147	0.000049		4	2	0.000267	0.000131	0.000020	0.000786	0.000361		
Bismuth (Bi) - Total	0.000050	10	10	0.000050	0.000050	0.000050	0.000050	0		4	2	0.000077	0.000056	0.000050	0.000146	0.000046		
Boron (B) - Total	0.010	10	10	0.010	0.010	0.010	0.010	0		4	0	0.015	0.015	0.013	0.018	0.002		1.2
Cadmium (Cd) - Total	0.0000050	10	0	0.000070	0.000053	0.0000128	0.000244	0.000077		4	0	0.00038	0.00023	0.0000111	0.00106	0.00049		
Calcium (Ca) - Total	0.050	10	0	28.3	27.5	25.6	36.6	3.2		4	0	60.6	59.3	55.6	68.3	5.5		
Cesium (Cs) - Total	0.000010	10	3	0.000203	0.000206	0.000010	0.000578	0.000216		4	1	0.00073	0.00050	0.000010	0.00192	0.00091		
Chromium (Cr) - Total	0.00050	10	4	0.00160	0.00119	0.00050	0.00478	0.00154		4	2	0.0060	0.0031	0.00050	0.0171	0.0078		
Cobalt (Co) - Total	0.00010	10	4	0.00057	0.00048	0.00010	0.00186	0.00062	0	4	0	0.0035	0.0015	0.00013	0.0107	0.0050	0	0.11
Copper (Cu) - Total	0.00050	10	0	0.00224	0.00204	0.00070	0.00608	0.00186		4	0	0.0100	0.0048	0.00058	0.0298	0.0138		
Iron (Fe) - Total	0.010	10	0	1.36	1.30	0.036	4.30	1.54	6	4	0	7.2	3.4	0.183	21.7	10.1	2	1
Lead (Pb) - Total	0.000050	10	3	0.00072	0.00071	0.000050	0.00227	0.00078	0	4	1	0.0044	0.0021	0.000050	0.0134	0.0063	0	EQ
Lithium (Li) - Total	0.0010	10	0	0.0023	0.0021	0.0011	0.0051	0.0014		4	0	0.0105	0.0089	0.0059	0.0183	0.0054		
Magnesium (Mg) - Total	0.0050	10	0	6.7	6.2	5.83	10.5	1.4		4	0	16.6	16.2	13.8	20.2	2.7		
Manganese (Mn) - Total	0.00010	10	0	0.0205	0.0174	0.00197	0.0694	0.0231	0	4	0	0.151	0.068	0.00863	0.462	0.211	0	EQ
Mercury (Hg) - Total	0.00000050	10	3	0.0000034	0.0000029	0.00000050	0.0000155	0.0000045		4	0	0.0000192	0.0000025	0.00000080	0.0000709	0.0000345		
Methylmercury (MeHg) - Total	0.000000020	10	5	0.00000004	0.00000002	0.000000020	0.00000020	0.00000006		4	2	0.000000101	0.000000028	0.000000020	0.000000328	0.000000152		
Molybdenum (Mo) - Total	0.000050	10	0	0.00087	0.00081	0.000731	0.00133	0.00018	0	4	0	0.00225	0.00179	0.000929	0.00450	0.00168	0	46
Nickel (Ni) - Total	0.00050	10	0	0.00270	0.00240	0.00076	0.00773	0.00243		4	0	0.0127	0.0064	0.00127	0.0367	0.0167		
Phosphorus (P) - Total	0.050	10	8	0.073	0.050	0.050	0.212	0.053		4	2	0.35	0.15	0.050	1.06	0.48		
Potassium (K) - Total	0.050	10	0	0.79	0.78	0.429	1.57	0.40		4	0	1.71	1.38	0.792	3.30	1.11		
Rubidium (Rb) - Total	0.00020	10	0	0.00242	0.00242	0.00038	0.00643	0.00222		4	0	0.0070	0.0044	0.00045	0.0187	0.0086		
Selenium (Se) - Total	0.000050	10	0	0.000336	0.000272	0.000212	0.000761	0.000165		4	0	0.00088	0.00096	0.000202	0.00140	0.00053		
Silicon (Si) - Total	0.10	10	0	3.37	2.99	2.13	7.05	1.66		4	0	6.7	4.1	2.34	16.3	6.6		
Silver (Ag) - Total	0.000010	10	4	0.000021	0.000018	0.000010	0.000046	0.000014	0	4	2	0.000073	0.000050	0.000010	0.000182	0.000082	0	EQ
Sodium (Na) - Total	0.050	10	0	1.26	1.19	1.03	2.03	0.29		4	0	4.41	3.09	2.19	9.26	3.30		
Strontium (Sr) - Total	0.00020	10	0	0.113	0.110	0.102	0.154	0.015		4	0	0.246	0.209	0.161	0.405	0.111		
Sulfur (S) - Total	0.50	10	0	5.27	5.12	4.46	7.90	0.99		4	0	12.7	11.2	5.29	23.2	7.5		
Tellurium (Te) - Total	0.00020	10	10	0.00020	0.00020	0.00020	0.00020	0		4	4	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Total	0.000010	10	4	0.000029	0.000024	0.000010	0.000078	0.000024		4	2	0.000100	0.000073	0.000010	0.000242	0.000112		
Thorium (Th) - Total	0.00010	10	4	0.00023	0.00016	0.00010	0.00063	0.00021		4	2	0.00100	0.00053	0.00010	0.00282	0.00128		
Tin (Sn) - Total	0.00010	10	10	0.00010	0.00010	0.00010	0.00010	0		4	4	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Total	0.00030	10	0	0.0126	0.0061	0.00074	0.0668	0.0203		4	1	0.0215	0.0157	0.00071	0.0538	0.0240		
Tungsten (W) - Total	0.00010	10	10	0.00010	0.00010	0.00010	0.00010	0		4	4	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Total	0.000010	10	0	0.000516	0.000515	0.000416	0.000700	0.000099		4	0	0.00100	0.00099	0.000713	0.00132	0.00025		
Vanadium (V) - Total	0.00050	10	2	0.0035	0.0029	0.00050	0.0105	0.0038		4	1	0.0130	0.0076	0.00050	0.0362	0.0167		
Zinc (Zn) - Total	0.0030	10	4	0.0084	0.0069	0.0030	0.0240	0.0072	0	4	2	0.039	0.021	0.0030	0.111	0.051	1	EQ
Zirconium (Zr) - Total	0.00020	10	10	0.00024	0.00020	0.00020	0.00060	0.00013		4	2	0.00024	0.00022	0.00020	0.00029	0.00004		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns and is highlighted in grey if there are any exceedances.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 39. 2022 annual water quality data summary statistics for field measurements, physical tests, anions, nutrients, and organic carbon at the Peace River and tributary sites within the Downstream Reach.

Parameter	Units	Min MDL	Peace River							Tributaries							BC Short-Term Maximum WQG[1]
			n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Field Measurements																			
Electrical Conductivity (in situ)	µS/cm	N/A	90		148	154.4	92.2	175.6	19		72		389	271	80.0	1,143	307		
Oxygen Dissolved (in situ)	%	N/A	75		98	97.9	93.4	101.4	2		60		96	95.9	90.1	105.5	4		
Oxygen Dissolved (in situ)	mg/L	N/A	90		10	10.3	9.62	10.78	0	0	72		10	9.2	7.88	12.34	1	33[2]	>5/>9
Redox Potential (in situ)	mV	N/A	90		127	117.2	67.7	202.8	35		71		138	137.8	81.7	187.9	27		
Salinity (in situ)	ppt	N/A	90		0.1	0.09	0.06	0.11	0.0		72		0.23	0.16	0.05	0.78	0.19		
Specific Conductivity (in situ)	µS/cm	N/A	90		194	199.6	127.0	234.5	22		72		475	342	106.9	1,554	382		
Temperature (in situ)	degC	N/A	90		13	12.8	9.8	16.2	2		72		15.9	16.1	6.1	27.0	6.4		
Total Dissolved Solids (in situ)	mg/L	N/A	90		126	130	83	152	14		72		309	222	69	1,010	248		
Turbidity (in situ)	NTU	N/A	89		70.9	19.43	1.87	325.94	95.7		72		109.5	16.27	1.48	506.65	161.9		
pH (in situ)	pH units	N/A	90		7.95	7.94	7.79	8.22	0.11	0	72		8.1	8.21	7.30	8.52	0.3	0	6.5 - 9
Physical Tests																			
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	1.0	33	0	91	89	73.8	113	10		27	0	136	142	22.7	213	59		
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	1.0	33	33	1.0	1.0	1.0	1.0	0		27	14	5.8	1.0	1.0	23.0	6.5		
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	1.0	33	33	1.0	1.0	1.0	1.0	0		27	27	1.0	1.0	1.0	1.0	0		
Alkalinity, Total (as $CaCO_3$)	mg/L	1.0	33	0	91	89	73.8	113	10		27	0	141	147	22.7	235	65		
Colour, True	TCU[3]	5.0	28	0	12.3	6.5	5.3	54.4	13.3		22	4	56	18	5.0	226	69		
Dissolved Hardness (as $CaCO_3$)	mg/L	0.50	33	0	100	97	86.2	122	9		27	0	182	157	51.6	536	119		
Specific Conductivity (lab)	µS/cm	2.0	33	0	197	194	178	240	16		27	0	440	318	114	1,530	351		
Total Dissolved Solids	mg/L	13	33	0	141	135	104	254	34		27	0	349	283	127	1,120	249		
Total Suspended Solids	mg/L	3.0	33	7	102	33	3.0	490	143		27	9	158	19	3.0	1,080	292		
pH (lab)	pH units	0.10	33	0	8.12	8.11	8.01	8.21	0.05	0	27	0	8.18	8.27	7.21	8.63	0.37	0	6.5 - 9
Anions and Nutrients																			
Ammonia, Total (as N)	mg/L	0.0050	33	11	0.0094	0.0073	0.0050	0.0198	0.0048	0	27	4	0.0196	0.0110	0.0050	0.0742	0.0185	0	EQ
Chloride (Total)	mg/L	0.50	33	33	0.50	0.50	0.50	0.50	0	0	27	5	5.0	1.4	0.50	36.0	9.2	0	600
Fluoride (F)	mg/L	0.020	33	0	0.045	0.042	0.034	0.068	0.011	0	27	0	0.118	0.092	0.045	0.252	0.065	0	EQ
Nitrate (as N)	mg/L	0.0050	33	0	0.0572	0.0547	0.0399	0.0862	0.0115	0	27	15	0.033	0.005	0.0050	0.283	0.058	0	32.8
Nitrite (as N)	mg/L	0.0010	33	19	0.0013	0.0010	0.0010	0.0029	0.0005		27	22	0.0023	0.0010	0.0010	0.0110	0.0025		
Orthophosphate - Dissolved (as P)	mg/L	0.0010	33	19	0.0021	0.0010	0.0010	0.0069	0.0017		27	11	0.0036	0.0019	0.0010	0.0121	0.0033		
Phosphorus (P) - Total	mg/L	0.0020	33	0	0.109	0.041	0.0060	0.401	0.126		27	0	0.17	0.03	0.0034	1.05	0.25		
Phosphorus (P) - Total Dissolved	mg/L	0.0020	33	19	0.0038	0.0020	0.0020	0.0107	0.0028		27	6	0.0096	0.0067	0.0020	0.0256	0.0079		
Silicate (as SiO_2)	mg/L	0.50	28	0	4.08	4.12	3.40	4.38	0.25		23	1	2.59	2.44	0.50	6.39	1.78		
Sulfate (SO_4)	mg/L	0.30	33	0	15.3	14.9	12.9	20.6	1.9		27	0	97	31	7.87	625	152		
Total Kjeldahl Nitrogen	mg/L	0.050	33	0	0.188	0.136	0.077	0.480	0.111		27	1	0.61	0.56	0.050	1.35	0.38		
Total Nitrogen	mg/L	0.030	33	0	0.225	0.193	0.136	0.478	0.086		27	1	0.59	0.57	0.050	1.36	0.35		
Organic / Inorganic Carbon																			
Dissolved Organic Carbon	mg/L	0.50	33	0	4.3	3.0	2.22	10.9	2.4		27	0	15.9	14.2	0.88	37.6	11.8		
Total Organic Carbon	mg/L	0.50	33	0	4.8	3.1	2.44	11.9	3.1		27	0	17.9	15.0	0.57	42.1	13.2		
Ion Balance																			
Anion Sum	mEq/L	0.10	22	0	2.07	2.02	1.75	2.69	0.25		18	0	5.7	4.6	1.09	17.9	4.6		
Cation - Anion Balance	% difference	0.010	22	1	2.15	1.58	0.010	5.74	1.81		18	0	2.76	1.75	0.167	8.40	2.77		
Cation Sum	mEq/L	0.10	22	0	2.02	1.98	1.78	2.52	0.18		18	0	5.8	4.5	1.29	17.6	4.6		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. The dissolved oxygen guidelines are minimum guidelines and dependent on salmonid life stages with the >5 mg/L guideline being applicable to all life stages other than buried embryo/alevin and the >9 mg/L guideline being applicable to buried embryo/alevin life stages. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns and is highlighted in grey if there are any exceedances.

[2]Only the BC WQG-AL (Buried embryo/alevin) was exceeded.

[3]True Colour Units.

N/A = not applicable.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

Table 40. 2022 annual water quality data summary statistics for dissolved metals concentrations at the Peace River and tributary sites within the Downstream Reach.

Parameter	Min MDL	Peace River								Tributaries								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Dissolved Metals (mg/L)																		
Aluminum (Al) - Dissolved	0.0010	11	0	0.0196	0.0075	0.0040	0.0544	0.0184		9	0	0.0254	0.0069	0.0017	0.0718	0.0288		
Antimony (Sb) - Dissolved	0.00010	11	4	0.00012	0.00011	0.00010	0.00014	0.00002		9	1	0.00016	0.00015	0.00010	0.00023	0.00004		
Arsenic (As) - Dissolved	0.00010	11	0	0.00024	0.00020	0.00018	0.00039	0.00007		9	0	0.00052	0.00056	0.00012	0.00090	0.00024		
Barium (Ba) - Dissolved	0.00010	11	0	0.0429	0.0366	0.0304	0.0601	0.0118		9	0	0.079	0.068	0.0302	0.149	0.037		
Beryllium (Be) - Dissolved	0.000020	11	11	0.000020	0.000020	0.000020	0.000020	0		9	8	0.000022	0.000020	0.000020	0.000037	0.000006		
Bismuth (Bi) - Dissolved	0.000050	11	11	0.000050	0.000050	0.000050	0.000050	0		9	9	0.000050	0.000050	0.000050	0.000050	0		
Boron (B) - Dissolved	0.010	11	11	0.010	0.010	0.010	0.010	0		9	1	0.039	0.027	0.010	0.139	0.040		
Cadmium (Cd) - Dissolved	0.0000050	11	1	0.0000106	0.0000076	0.0000050	0.0000228	0.0000056	0	9	3	0.0000118	0.0000105	0.0000050	0.0000352	0.0000095	0	EQ
Calcium (Ca) - Dissolved	0.050	33	0	28.5	27.6	25.3	34.1	2.5		27	0	47	40	14.7	126	28		
Cesium (Cs) - Dissolved	0.000010	11	11	0.000010	0.000010	0.000010	0.000010	0		9	9	0.000010	0.000010	0.000010	0.000010	0		
Chromium (Cr) - Dissolved	0.00050	11	11	0.00050	0.00050	0.00050	0.00050	0		9	9	0.00050	0.00050	0.00050	0.00050	0		
Cobalt (Co) - Dissolved	0.00010	11	6	0.00013	0.00010	0.00010	0.00020	0.00004		9	2	0.00024	0.00021	0.00010	0.00062	0.00016		
Copper (Cu) - Dissolved	0.00020	11	0	0.00091	0.00062	0.00058	0.00156	0.00038	0	9	0	0.00188	0.00161	0.00031	0.00370	0.00110	0	EQ
Ferrous Iron (Fe(II)) - Dissolved	0.020	6	6	0.020	0.020	0.020	0.020	0		5	3	0.033	0.020	0.020	0.061	0.019		
Iron (Fe) - Dissolved	0.010	11	6	0.042	0.010	0.010	0.136	0.046	0	9	3	0.108	0.050	0.010	0.449	0.150	1	0.35
Lead (Pb) - Dissolved	0.000050	11	9	0.000057	0.000050	0.000050	0.000091	0.000015		9	5	0.000088	0.000050	0.000050	0.000242	0.000071		
Lithium (Li) - Dissolved	0.0010	11	0	0.0021	0.0013	0.0011	0.0034	0.0010		9	0	0.0086	0.0069	0.0023	0.0291	0.0080		
Magnesium (Mg) - Dissolved	0.0050	33	0	6.92	6.97	5.53	9.05	0.78		27	0	15.6	12.0	3.63	53.9	12.5		
Manganese (Mn) - Dissolved	0.00010	11	0	0.0041	0.0009	0.00067	0.0118	0.0041		9	0	0.0142	0.0119	0.00140	0.0501	0.0147		
Mercury (Hg) - Dissolved	0.00000050	11	5	0.00000105	0.00000124	0.00000050	0.00000182	0.00000054		9	1	0.00000237	0.00000241	0.00000050	0.00000457	0.00000127		
Methylmercury (MeHg) - Dissolved	0.000000020	11	7	0.000000027	0.000000020	0.000000020	0.000000057	0.000000014		9	3	0.000000087	0.000000045	0.000000020	0.000000226	0.000000074		
Molybdenum (Mo) - Dissolved	0.000050	11	0	0.00084	0.00079	0.000739	0.00114	0.00014		9	0	0.00091	0.00093	0.000390	0.00146	0.00034		
Nickel (Ni) - Dissolved	0.00050	11	0	0.00112	0.00067	0.00058	0.00205	0.00061		9	1	0.00309	0.00352	0.00050	0.00571	0.00182		
Phosphorus (P) - Dissolved	0.050	11	11	0.050	0.050	0.050	0.050	0		9	9	0.050	0.050	0.050	0.050	0		
Potassium (K) - Dissolved	0.050	12	0	0.574	0.475	0.421	0.887	0.176		9	0	2.78	2.21	0.510	9.82	2.81		
Rubidium (Rb) - Dissolved	0.00020	11	0	0.00029	0.00029	0.00024	0.00035	0.00003		9	1	0.00080	0.00061	0.00020	0.00218	0.00059		
Selenium (Se) - Dissolved	0.000050	11	0	0.000337	0.000286	0.000247	0.000502	0.000094		9	0	0.000365	0.000344	0.000243	0.000582	0.000105		
Silicon (Si) - Dissolved	0.050	11	0	1.87	1.87	1.68	2.14	0.13		9	1	1.12	1.20	0.050	2.21	0.88		
Silver (Ag) - Dissolved	0.000010	11	11	0.000010	0.000010	0.000010	0.000010	0		9	9	0.000010	0.000010	0.000010	0.000010	0		
Sodium (Na) - Dissolved	0.050	12	0	1.58	1.48	1.06	2.39	0.48		9	0	35	8	1.43	153	49		
Strontium (Sr) - Dissolved	0.00020	11	0	0.107	0.105	0.0925	0.131	0.012		9	0	0.220	0.204	0.0588	0.596	0.162		
Sulfur (S) - Dissolved	0.50	11	0	4.99	4.62	4.27	6.52	0.73		9	0	41	18	2.73	225	70		
Tellurium (Te) - Dissolved	0.00020	11	11	0.00020	0.00020	0.00020	0.00020	0		9	9	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Dissolved	0.000010	11	11	0.000010	0.000010	0.000010	0.000010	0		9	8	0.000010	0.000010	0.000010	0.000012	0.000001		
Thorium (Th) - Dissolved	0.00010	11	11	0.00010	0.00010	0.00010	0.00010	0		9	8	0.00010	0.00010	0.00010	0.00014	0.00001		
Tin (Sn) - Dissolved	0.00010	11	11	0.00010	0.00010	0.00010	0.00010	0		9	9	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Dissolved	0.00030	11	6	0.00070	0.00030	0.00030	0.00183	0.00058		9	6	0.00109	0.00030	0.00030	0.00569	0.00177		
Tungsten (W) - Dissolved	0.00010	11	11	0.00010	0.00010	0.00010	0.00010	0		9	9	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Dissolved	0.000010	11	0	0.000422	0.000402	0.000346	0.000598	0.000070		9	0	0.00106	0.00058	0.000244	0.00298	0.00092		
Vanadium (V) - Dissolved	0.00050	11	10	0.00050	0.00050	0.00050	0.00054	0.00001		9	5	0.00058	0.00050	0.00050	0.00084	0.00012		
Zinc (Zn) - Dissolved	0.0010	11	11	0.0010	0.0010	0.0010	0.0010	0		9	8	0.0010	0.0010	0.0010	0.0011	0.0000		EQ[2]
Zirconium (Zr) - Dissolved	0.00030	11	11	0.00033	0.00030	0.00030	0.00060	0.00009		9	8	0.00040	0.00030	0.00030	0.00090	0.00022		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns and is highlighted in grey if there are any exceedances. Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.
n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances
[2]Total zinc short-term (maximum) BC WQG was applied to dissolved zinc values.

Table 41. 2022 annual water quality data summary statistics for total metals concentrations at the Peace River and tributary sites within the Downstream Reach.

Parameter	Min MDL	Peace River								Tributaries								BC Short-Term Maximum WQG[1]
		n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	n	n<MDL	Avg.	Med.	Min.	Max.	SD	# Exc	
Total Metals (mg/L)																		
Aluminum (Al) - Total	0.0030	11	0	2.28	0.23	0.0887	5.78	2.50		9	0	3.6	0.2	0.0499	10.4	4.6		
Antimony (Sb) - Total	0.00010	11	6	0.00021	0.00010	0.00010	0.00038	0.00013		9	1	0.00024	0.00017	0.00010	0.00044	0.00013		
Arsenic (As) - Total	0.00010	11	0	0.00230	0.00039	0.00026	0.00582	0.00239		9	0	0.0040	0.0008	0.00020	0.0117	0.0047		
Barium (Ba) - Total	0.00010	11	0	0.150	0.042	0.0364	0.335	0.132		9	0	0.236	0.157	0.0743	0.463	0.160		
Beryllium (Be) - Total	0.000020	11	6	0.000171	0.000020	0.000020	0.000432	0.000180		9	4	0.000289	0.000022	0.000020	0.000794	0.000350		
Bismuth (Bi) - Total	0.000050	11	6	0.000070	0.000050	0.000050	0.000130	0.000030		9	6	0.000096	0.000050	0.000050	0.000210	0.000070		
Boron (B) - Total	0.010	11	6	0.012	0.010	0.010	0.017	0.003		9	1	0.048	0.032	0.010	0.162	0.046		1.2
Cadmium (Cd) - Total	0.0000050	11	0	0.000223	0.000029	0.0000188	0.000522	0.000235		9	1	0.000275	0.000031	0.0000050	0.000851	0.000334		
Calcium (Ca) - Total	0.050	11	0	33.0	28.1	26.2	42.1	6.8		9	0	58	55	20.1	136	32		
Cesium (Cs) - Total	0.000010	11	0	0.00060	0.00005	0.000017	0.00162	0.00067		9	1	0.00081	0.00003	0.000010	0.00225	0.00103		
Chromium (Cr) - Total	0.00050	11	5	0.0043	0.0005	0.00050	0.0109	0.0045		9	5	0.0066	0.0005	0.00050	0.0183	0.0080		
Cobalt (Co) - Total	0.00010	11	1	0.00231	0.00018	0.00010	0.00653	0.00267	0	9	2	0.0041	0.0003	0.00010	0.0116	0.0052	0	0.11
Copper (Cu) - Total	0.00050	11	0	0.0066	0.0011	0.00081	0.0169	0.0068		9	1	0.0116	0.0020	0.00050	0.0298	0.0133		
Iron (Fe) - Total	0.010	11	0	5.4	0.4	0.104	15.0	6.3	5	9	0	9.0	0.7	0.063	24.1	11.3	4	1
Lead (Pb) - Total	0.000050	11	0	0.00281	0.00020	0.000058	0.00792	0.00326	0	9	2	0.0048	0.0002	0.000050	0.0127	0.0060	0	EQ
Lithium (Li) - Total	0.0010	11	0	0.0052	0.0016	0.0014	0.0118	0.0045		9	0	0.0142	0.0090	0.0076	0.0310	0.0080		
Magnesium (Mg) - Total	0.0050	11	0	8.1	6.8	6.11	11.1	2.0		9	0	19.4	15.8	7.13	57.5	15.0		
Manganese (Mn) - Total	0.00010	11	0	0.089	0.010	0.00412	0.230	0.099	0	9	0	0.156	0.109	0.00268	0.372	0.145	0	EQ
Mercury (Hg) - Total	0.00000050	11	4	0.0000130	0.0000026	0.00000050	0.0000382	0.0000153		9	1	0.0000163	0.0000035	0.00000050	0.0000486	0.0000199		
Methylmercury (MeHg) - Total	0.000000020	11	7	0.00000012	0.000000148	0.000000020	0.000000201	0.00000009		9	6	0.00000013	0.00000013	0.000000020	0.00000020	0.00000008		
Molybdenum (Mo) - Total	0.000050	11	0	0.00095	0.00086	0.000825	0.00125	0.00016	0	9	0	0.00107	0.00106	0.000784	0.00153	0.00026	0	46
Nickel (Ni) - Total	0.00050	11	0	0.0084	0.0012	0.00093	0.0218	0.0089		9	0	0.0154	0.0064	0.00064	0.0372	0.0161		
Phosphorus (P) - Total	0.050	11	6	0.226	0.050	0.050	0.532	0.213		9	5	0.318	0.050	0.050	0.780	0.327		
Potassium (K) - Total	0.050	11	0	1.20	0.54	0.466	2.30	0.82		9	0	3.7	2.4	0.705	10.7	3.0		
Rubidium (Rb) - Total	0.00020	11	0	0.0056	0.0008	0.00053	0.0137	0.0058		9	0	0.0081	0.0024	0.00038	0.0209	0.0090		
Selenium (Se) - Total	0.000050	11	0	0.000487	0.000307	0.000240	0.000927	0.000255		9	0	0.000543	0.000541	0.000178	0.000898	0.000257		
Silicon (Si) - Total	0.10	11	0	5.08	2.36	2.05	9.82	3.41		9	0	6.2	1.3	0.18	16.5	7.2		
Silver (Ag) - Total	0.000010	11	6	0.000057	0.000010	0.000010	0.000148	0.000058	3	9	5	0.000079	0.000010	0.000010	0.000236	0.000093	1	EQ
Sodium (Na) - Total	0.050	11	0	1.63	1.29	1.07	2.51	0.54		9	0	36	9	1.44	158	50		
Strontium (Sr) - Total	0.00020	11	0	0.125	0.114	0.104	0.150	0.021		9	0	0.255	0.214	0.0985	0.660	0.166		
Sulfur (S) - Total	0.50	11	0	5.21	4.70	3.86	7.16	1.08		9	0	44	20	3.17	242	76		
Tellurium (Te) - Total	0.00020	11	11	0.00020	0.00020	0.00020	0.00020	0		9	9	0.00020	0.00020	0.00020	0.00020	0		
Thallium (Tl) - Total	0.000010	11	6	0.000071	0.000010	0.000010	0.000171	0.000072		9	4	0.000093	0.000015	0.000010	0.000260	0.000105		
Thorium (Th) - Total	0.00010	11	6	0.00072	0.00010	0.00010	0.00201	0.00077		9	5	0.00131	0.00010	0.00010	0.00369	0.00163		
Tin (Sn) - Total	0.00010	11	11	0.00010	0.00010	0.00010	0.00010	0		9	9	0.00010	0.00010	0.00010	0.00010	0		
Titanium (Ti) - Total	0.00030	11	2	0.0153	0.0040	0.00161	0.0359	0.0146		9	1	0.0153	0.0053	0.00080	0.0361	0.0151		
Tungsten (W) - Total	0.00010	11	11	0.00010	0.00010	0.00010	0.00010	0		9	9	0.00010	0.00010	0.00010	0.00010	0		
Uranium (U) - Total	0.000010	11	0	0.000642	0.000483	0.000436	0.000991	0.000216		9	0	0.00143	0.00137	0.000444	0.00303	0.00074		
Vanadium (V) - Total	0.00050	11	0	0.0090	0.0015	0.00078	0.0213	0.0094		9	2	0.0129	0.0007	0.00050	0.0350	0.0158		
Zinc (Zn) - Total	0.0030	11	6	0.0276	0.0030	0.0030	0.0726	0.0300	3	9	5	0.043	0.003	0.0030	0.117	0.052	3	EQ
Zirconium (Zr) - Total	0.00020	11	8	0.00023	0.00020	0.00020	0.00034	0.00005		9	4	0.00049	0.00043	0.00020	0.00128	0.00035		

[1]EQ indicates that the guideline values vary per sample based on applicable equations defined by BC ENV (2021a). To calculate the short-term BC WQG values using an equation, the site chemistry parameter values as measured at each site/date are used; in situ pH and temperature were used where applicable. A count of the total number of exceedances considering all sampling dates is provided in the "# Exc" columns and is highlighted in grey if there are any exceedances.

Parameters with a concentration below the detection limit are assumed to have a concentration equal to the detection limit for the calculation of summary statistics.

n<MDL = number of samples below the method detection limit, Avg. = Average, Med. = Median, Min. = Min, Max. = Max, SD = Standard Deviation, # Exc = Number of exceedances

4. 2022 SEDIMENT QUALITY TABLES AND FIGURES

Table 42. Physical tests, organic/inorganic carbon, particle size, anions, and nutrients in sediment quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach, and Downstream Reach of the Peace River in October 2022.

Site	Units	W1	D1	PC1		PR1		PR2	HD	PR3	MD
Date		18-Oct-2022	18-Oct-2022	21-Oct-2022		21-Oct-2022		21-Oct-2022	21-Oct-2022	18-Oct-2022	18-Oct-2022
Sample Depth (m)		2.5	4.8	0.5		2.2		1.6	0.5	2.5	0.3
Replicate		A	A	A	B	A	B	A	A	A	A
Organic / Inorganic Carbon											
Inorganic Carbon (as $CaCO_3$)	%	24.1	9.68	2.82	3.03	2.64	2.73	12.8	6.91	5.31	4.70
Organic Matter	%	1.29	2.46	2.55	2.48	2.07	2.02	2.09	2.57	1.81	1.70
Total Carbon	%	3.64	2.59	1.82	1.80	1.52	1.50	2.75	2.32	1.69	1.55
Total Inorganic Carbon	%	2.89	1.16	0.339	0.363	0.317	0.328	1.54	0.829	0.637	0.564
Total Organic Carbon	%	0.750	1.43	1.48	1.44	1.20	1.17	1.21	1.49	1.05	0.986
Physical Tests											
pH (lab)	pH units	8.27	8.14	8.67	8.70	8.15	8.08	8.08	8.22	8.12	8.36
Particle Size											
% Clay (<4 µm)	%	12.8	15.2	4.0	5.7	7.9	7.7	10.3	13.5	7.5	7.7
% Gravel (>2 mm)	%	<1.0	<1.0	36.5	33.3	<1.0	<1.0	<1.0	<1.0	1.4	<1.0
% Sand (0.063 mm - 0.125 mm)	%	4.4	6.6	1.8	2.5	12.5	12.6	9.0	24.0	22.1	15.6
% Sand (0.125 mm - 0.25 mm)	%	<1.0	2.5	3.9	5.8	<1.0	<1.0	6.9	9.9	25.5	39.0
% Sand (0.25 mm - 0.50 mm)	%	<1.0	1.0	4.8	8.0	<1.0	<1.0	17.3	1.5	7.5	17.4
% Sand (0.50 mm - 1.0 mm)	%	<1.0	<1.0	12.0	13.1	<1.0	<1.0	<1.0	<1.0	1.6	1.3
% Sand (1.0 mm - 2.0 mm)	%	<1.0	<1.0	28.4	18.8	<1.0	<1.0	<1.0	<1.0	1.2	<1.0
% Silt (0.004 mm - 0.0312 mm)	%	56.2	49.0	5.8	8.7	42.9	42.9	34.7	27.9	17.6	10.3
% Silt (0.0312 mm - 0.063 mm)	%	26.3	24.9	2.8	4.1	35.9	36.1	21.6	23.0	15.6	8.6
Anions and Nutrients											
Total Nitrogen	%	0.046	0.113	0.105	0.104	0.097	0.094	0.089	0.113	0.080	0.058
Plant Available Nutrients											
Available Ammonium as N	mg/kg	<1.0	3.6	2.1	3.2	8.8	9.3	10.4	2.6	4.8	1.3
Available Nitrate as N	mg/kg	<2.5	<2.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Available Nitrate and Nitrite as N	mg/kg	<2.5	<2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Available Nitrite as N	mg/kg	<0.99	<0.98	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Available Phosphate as P	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Table 42. Continued (2 of 2).

Site	Units	PD1	PINE	PD2	BEA	PD3	KR	PD4	POUCE	PD5
Date		22-Oct-2022	22-Oct-2022	20-Oct-2022	17-Oct-2022	20-Oct-2022	17-Oct-2022	17-Oct-2022	17-Oct-2022	20-Oct-2022
Sample Depth (m)		2.7	0.35	2.0	0.2	2.3	0.3	2.0	0.2	2.1
Replicate		A	A	A	A	A	A	A	A	A
Organic / Inorganic Carbon										
Inorganic Carbon (as $CaCO_3$)	%	6.67	5.19	4.48	1.15	4.75	4.52	3.55	1.48	5.03
Organic Matter	%	2.95	2.31	1.47	0.87	2.21	0.88	1.32	2.09	2.60
Total Carbon	%	2.51	1.96	1.39	0.644	1.85	1.05	1.19	1.39	2.11
Total Inorganic Carbon	%	0.800	0.622	0.538	0.138	0.570	0.542	0.426	0.178	0.604
Total Organic Carbon	%	1.71	1.34	0.852	0.506	1.28	0.508	0.764	1.21	1.51
Physical Tests										
pH (lab)	pH units	7.93	8.16	8.20	8.22	8.07	8.51	8.04	8.18	7.96
Particle Size										
% Clay (<4 µm)	%	7.0	9.6	4.8	5.6	6.6	5.8	9.0	2.5	12.7
% Gravel (>2 mm)	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.1	<1.0
% Sand (0.063 mm - 0.125 mm)	%	25.9	27.7	38.3	43.3	31.9	14.3	30.1	3.1	18.6
% Sand (0.125 mm - 0.25 mm)	%	17.2	3.3	27.6	15.7	21.2	47.6	13.5	12.2	<1.0
% Sand (0.25 mm - 0.50 mm)	%	1.1	<1.0	<1.0	<1.0	<1.0	17.7	1.0	39.7	<1.0
% Sand (0.50 mm - 1.0 mm)	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	22.8	<1.0
% Sand (1.0 mm - 2.0 mm)	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12.8	<1.0
% Silt (0.004 mm - 0.0312 mm)	%	24.2	30.5	11.8	14.4	19.2	7.6	23.7	2.8	37.5
% Silt (0.0312 mm - 0.063 mm)	%	24.5	28.8	16.9	20.8	20.8	6.7	22.6	2.0	30.6
Anions and Nutrients										
Total Nitrogen	%	0.112	0.084	0.064	0.048	0.089	0.048	0.071	0.026	0.119
Plant Available Nutrients										
Available Ammonium as N	mg/kg	11.8	2.7	3.4	1.4	10.4	1.1	1.4	1.3	10.4
Available Nitrate as N	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Available Nitrate and Nitrite as N	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Available Nitrite as N	mg/kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Available Phosphate as P	mg/kg	<2.0	<2.0	<2.0	2.4	<2.0	<2.0	<2.0	<2.0	<2.0

Table 43. Metal concentrations in sediment quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach, and Downstream Reach of the Peace River in October 2022.

Site	Units	W1	D1	PC1		PR1		PR2	HD	PR3	MD	BC Working		BC Alert Concentration
Date		18-Oct-2022	18-Oct-2022	21-Oct-2022		21-Oct-2022		21-Oct-2022	21-Oct-2022	18-Oct-2022	18-Oct-2022			
Sample Depth (m)		2.5	4.8	0.5		2.2		1.6	0.5	2.5	0.3			
Replicate		A	A	A	B	A	B	A	A	A	A	ISQG[1]	PEL[1]	
Metals														
Aluminum (Al)	mg/kg	8,470	8,640	12,600	16,400	6,010	5,940	6,730	7,190	6,280	5,620			
Antimony (Sb)	mg/kg	0.94	0.81	0.62	0.56	0.47	0.46	0.62	0.66	0.55	0.46			
Arsenic (As)	mg/kg	6.22	7.16	8.34	8.04	5.86	5.86	5.36	7.67	7.64	6.47	5.9	17	
Barium (Ba)	mg/kg	134	356	219	240	593	583	312	483	405	232			
Beryllium (Be)	mg/kg	0.34	0.45	0.52	0.64	0.36	0.37	0.31	0.47	0.46	0.36			
Bismuth (Bi)	mg/kg	<0.20	<0.20	<0.20	0.23	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20			
Boron (B)	mg/kg	<5.0	7.2	8.5	9.9	6.8	6.8	7.1	8.2	8.3	5.1			
Cadmium (Cd)	mg/kg	1.47	1.00	0.414	0.422	0.448	0.456	0.767	0.710	0.493	0.414	0.6	3.5	
Calcium (Ca)	mg/kg	75,700	27,800	16,800	11,100	8,430	8,590	41,400	23,500	18,200	14,700			
Chromium (Cr)	mg/kg	21.4	20.6	29.1	35.0	12.4	12.5	16.0	15.0	14.2	12.1	37.3	90	
Cobalt (Co)	mg/kg	6.72	6.86	8.49	10.1	4.89	4.85	5.21	7.07	5.50	6.37			
Copper (Cu)	mg/kg	17.5	19.0	32.0	42.4	12.3	12.1	12.4	16.6	12.4	12.4	35.7	197	
Iron (Fe)	mg/kg	19,800	19,300	25,100	29,600	13,000	13,400	13,800	15,800	15,600	14,900	21,200	43,766	
Lead (Pb)	mg/kg	7.60	9.32	8.84	11.0	7.31	7.16	6.48	7.93	6.84	6.13	35	91.3	
Lithium (Li)	mg/kg	15.7	13.2	23.8	34.5	9.1	8.9	10.0	10.6	8.4	7.8			
Magnesium (Mg)	mg/kg	20,500	12,200	9,450	10,700	3,740	3,710	11,900	6,380	5,540	4,330			
Manganese (Mn)	mg/kg	357	257	300	290	180	181	232	229	182	270	460	1,100	
Mercury (Hg)	mg/kg	<0.0500	0.0627	<0.0500	<0.0500	0.0599	0.0572	<0.0500	<0.0500	<0.0500	<0.0500	0.17	0.486	
Molybdenum (Mo)	mg/kg	1.36	1.09	0.76	0.84	0.95	0.95	1.16	1.48	1.82	1.21	25	23,000	
Nickel (Ni)	mg/kg	23.4	25.4	28.9	35.3	17.3	17.0	18.5	21.6	17.9	20.8	16	75	
Phosphorus (P)	mg/kg	747	813	843	919	648	651	703	862	714	572			
Potassium (K)	mg/kg	960	1,570	1,820	2,200	1,410	1,400	1,220	1,440	1,380	1,080			
Selenium (Se)	mg/kg	0.37	0.72	0.36	0.36	0.58	0.49	0.51	0.90	0.65	0.45			2
Silver (Ag)	mg/kg	<0.10	0.20	0.17	0.24	0.21	0.22	0.14	0.18	0.13	<0.10	0.5		
Sodium (Na)	mg/kg	108	100	137	165	90	83	91	96	97	78			
Strontium (Sr)	mg/kg	138	63.4	53.8	43.3	35.8	35.8	86.5	74.0	56.0	43.7			
Sulfur (S)	mg/kg	<1,000	<1,000	<1,000	<1,000	2,100	2,100	<1,000	<1,000	1,200	<1,000			
Thallium (Tl)	mg/kg	0.219	0.208	0.116	0.142	0.140	0.138	0.154	0.166	0.131	0.102			
Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
Titanium (Ti)	mg/kg	268	124	100	47.2	21.7	20.4	120	22.8	30.8	58.3			
Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Uranium (U)	mg/kg	0.853	0.918	0.614	0.611	0.777	0.775	0.769	0.936	0.851	0.526			
Vanadium (V)	mg/kg	44.1	42.6	52.6	60.0	25.6	25.4	35.5	33.6	30.4	26.3			
Zinc (Zn)	mg/kg	76.3	85.3	86.0	106	65.4	64.2	60.9	79.8	68.2	56.8	123	315	
Zirconium (Zr)	mg/kg	3.3	1.4	2.1	2.0	1.3	1.2	1.9	2.0	1.7	1.9			

[1]Freshwater guidelines; ISQG = Interim Sediment Quality Guideline; PEL = Probable Effect Level

Yellow shading indicates an exceedance of the BC Working ISQG or PEL (BC ENV 2021b) or the BC Alert Concentration (BC ENV 2021a).

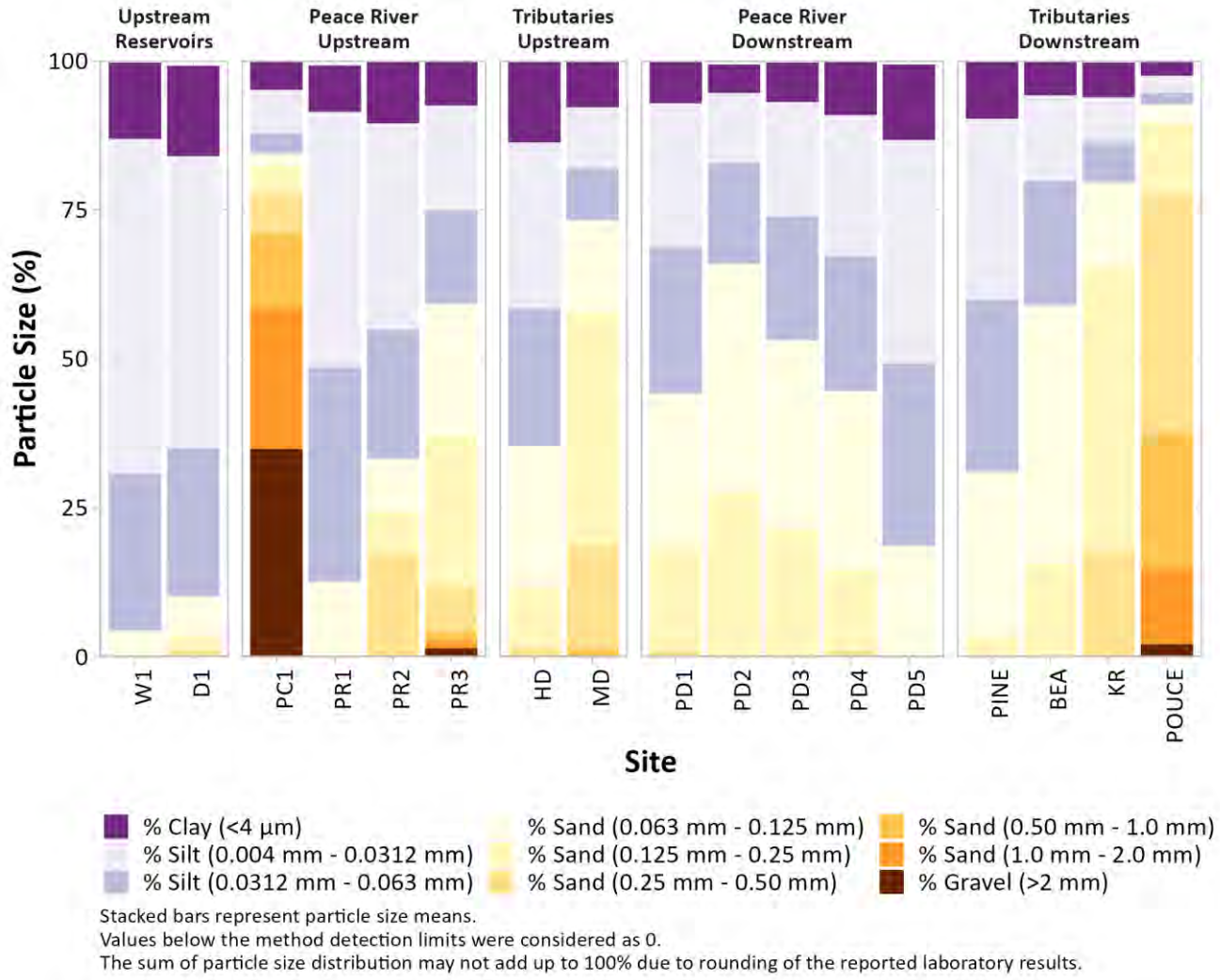
Table 43. Continued (2 of 2).

Site	Units	PD1	PINE	PD2	BEA	PD3	KR	PD4	POUCE	PD5	BC Working		BC Alert Concentration
Date		22-Oct-2022	22-Oct-2022	20-Oct-2022	17-Oct-2022	20-Oct-2022	17-Oct-2022	17-Oct-2022	17-Oct-2022	20-Oct-2022			
Sample Depth (m)		2.7	0.35	2.0	0.2	2.3	0.3	2.0	0.2	2.1			
Replicate		A	A	A	A	A	A	A	A	A	ISQG[1]	PEL[1]	
Metals													
Aluminum (Al)	mg/kg	5,440	4,940	5,060	5,090	5,210	6,940	6,820	2,550	6,310			
Antimony (Sb)	mg/kg	0.60	0.50	0.59	0.64	0.57	0.57	0.63	0.49	0.59			
Arsenic (As)	mg/kg	6.48	5.92	6.36	8.61	6.81	6.66	8.22	7.29	7.12	5.9	17	
Barium (Ba)	mg/kg	461	366	420	443	418	365	423	114	446			
Beryllium (Be)	mg/kg	0.39	0.36	0.34	0.42	0.33	0.51	0.47	0.34	0.44			
Bismuth (Bi)	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20			
Boron (B)	mg/kg	5.1	<5.0	5.7	<5.0	5.3	6.5	6.8	<5.0	5.0			
Cadmium (Cd)	mg/kg	0.683	0.475	0.419	0.424	0.539	0.474	0.577	0.160	0.626	0.6	3.5	
Calcium (Ca)	mg/kg	23,200	18,200	18,700	3,920	17,100	13,500	12,300	4,880	16,500			
Chromium (Cr)	mg/kg	12.5	10.7	12.3	12.4	11.8	15.0	15.2	5.86	14.1	37.3	90	
Cobalt (Co)	mg/kg	6.10	5.16	5.35	7.39	5.96	7.03	7.38	4.13	7.06			
Copper (Cu)	mg/kg	16.1	11.1	10.4	11.9	12.6	13.5	14.1	6.08	15.8	35.7	197	
Iron (Fe)	mg/kg	14,800	15,000	15,300	17,900	15,600	16,600	18,600	19,900	17,200	21,200	43,766	
Lead (Pb)	mg/kg	7.91	7.10	7.19	7.07	7.16	7.60	7.81	4.02	8.43	35	91.3	
Lithium (Li)	mg/kg	9.4	8.5	7.9	7.3	7.9	10.4	9.9	4.2	10.6			
Magnesium (Mg)	mg/kg	7,170	5,230	5,180	2,390	5,480	3,950	4,510	1,690	6,150			
Manganese (Mn)	mg/kg	207	177	190	240	208	251	295	193	243	460	1,100	
Mercury (Hg)	mg/kg	0.0507	<0.0500	<0.0500	0.0520	<0.0500	<0.0500	0.0554	<0.0500	0.0572	0.17	0.486	
Molybdenum (Mo)	mg/kg	1.33	0.97	1.18	1.06	1.18	0.88	1.17	0.84	1.14	25	23,000	
Nickel (Ni)	mg/kg	20.7	17.7	17.7	20.6	19.5	22.6	21.9	12.1	22.4	16	75	
Phosphorus (P)	mg/kg	780	660	693	528	725	490	617	460	716			
Potassium (K)	mg/kg	960	960	980	940	930	1,310	1,370	490	1,060			
Selenium (Se)	mg/kg	0.68	0.46	0.48	0.57	0.50	0.56	0.65	0.36	0.69			2
Silver (Ag)	mg/kg	0.19	0.14	0.12	0.13	0.13	0.15	0.16	<0.10	0.18	0.5		
Sodium (Na)	mg/kg	70	63	67	88	66	92	82	71	73			
Strontium (Sr)	mg/kg	63.0	47.2	54.5	25.4	49.2	41.9	43.2	21.5	49.8			
Sulfur (S)	mg/kg	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	1,200			
Thallium (Tl)	mg/kg	0.154	0.125	0.118	0.110	0.131	0.142	0.141	<0.050	0.155			
Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			
Titanium (Ti)	mg/kg	17.2	15.3	38.1	39.9	32.0	24.8	34.2	53.3	18.1			
Tungsten (W)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			
Uranium (U)	mg/kg	0.924	0.716	0.795	0.725	0.756	0.671	0.815	0.539	0.854			
Vanadium (V)	mg/kg	26.3	23.4	25.5	26.4	24.8	30.7	32.4	17.2	27.6			
Zinc (Zn)	mg/kg	71.5	64.4	63.0	76.5	67.6	70.9	77.2	37.9	79.8	123	315	
Zirconium (Zr)	mg/kg	2.0	1.2	2.0	2.4	1.8	1.8	1.9	2.1	2.1			

[1]Freshwater guidelines; ISQG = Interim Sediment Quality Guideline; PEL = Probable Effect Level.

Yellow shading indicates an exceedance of the BC Working ISQG or PEL (BC ENV 2021b) or the BC Alert Concentration (BC ENV 2021a).

Figure 2. **Particle size distribution in sediment quality samples collected from the Upstream Reservoirs, Site C Reservoir Reach (Peace River and Tributaries Upstream), and Downstream Reach (Peace River and Tributaries Downstream) in October 2022.**



Stacked bars represent particle size means.
Values below the method detection limits were considered as 0.
The sum of particle size distribution may not add up to 100% due to rounding of the reported laboratory results.

REFERENCES

BC ENV (British Columbia Ministry of Environment and Climate Change Strategy). 2021a. British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture - Guideline Summary. Water Quality Guideline Series, WQG-20. Prov. B.C., Victoria B.C. Available online at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf. Accessed on June 7, 2023.

Appendix B. 2022 Site Photos

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Figure 1. Downstream view of site W1 on July 25, 2022.

Figure 2. Upstream view of site D1 on July 25, 2022.

Figure 3. Downstream view of site PC1 on July 26, 2022.

Figure 4. Upstream view of site PR1 on July 26, 2022.

Figure 5. Downstream view of site PR2 on July 26, 2022.

Figure 6. Downstream view of site HD on July 26, 2022.

Figure 7. Upstream view of site PR3 on July 26, 2022.

Figure 8. Downstream view of site MD on July 25, 2022.

Figure 9. Upstream view of site PD1 on July 27, 2022.

Figure 10. Upstream view of site PINE on July 27, 2022.

Figure 11. Downstream view of site PD2 on July 27, 2022.

Figure 12. Upstream view of site BEA on July 27, 2022.

Figure 13. Upstream view of site PD3 on July 27, 2022.

Figure 14. Upstream view of site KR on July 27, 2022.

Figure 15. Downstream view of site PD4 on July 27, 2022.

Figure 16. Upstream view of site POUCE on July 27, 2022.

Figure 17. Upstream view of site PD5 on July 28, 2022.

Appendix C. 2022 Quality Assurance and Quality Control Summary

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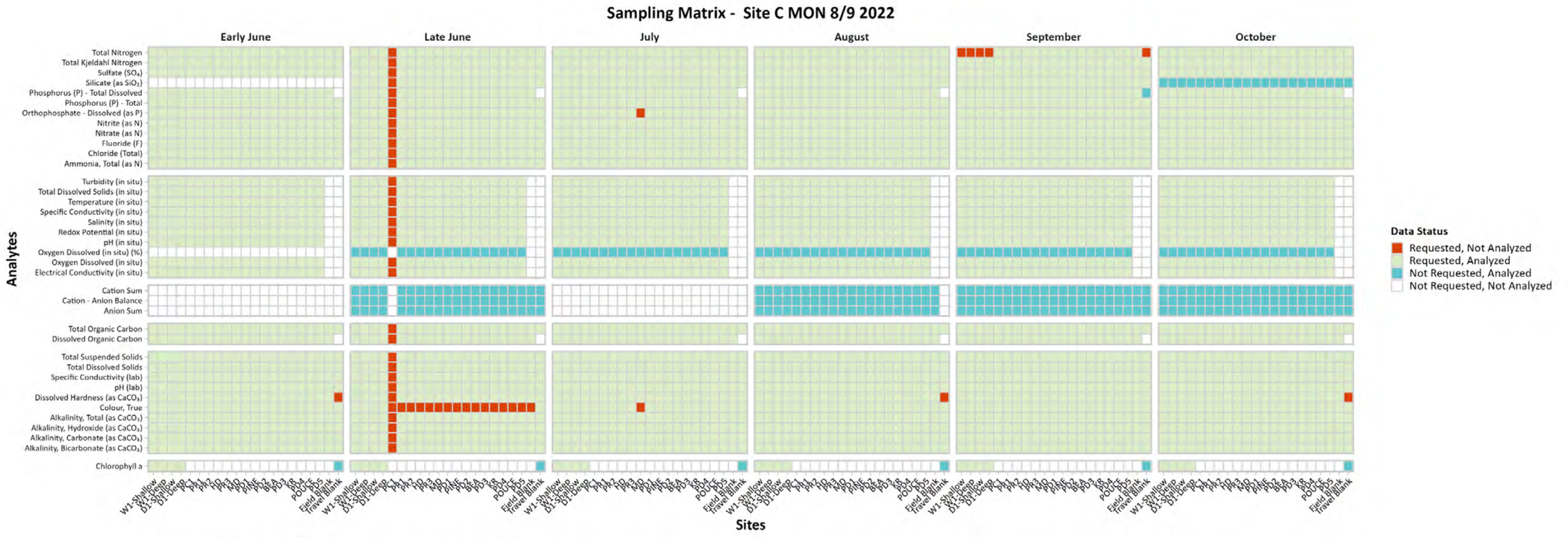
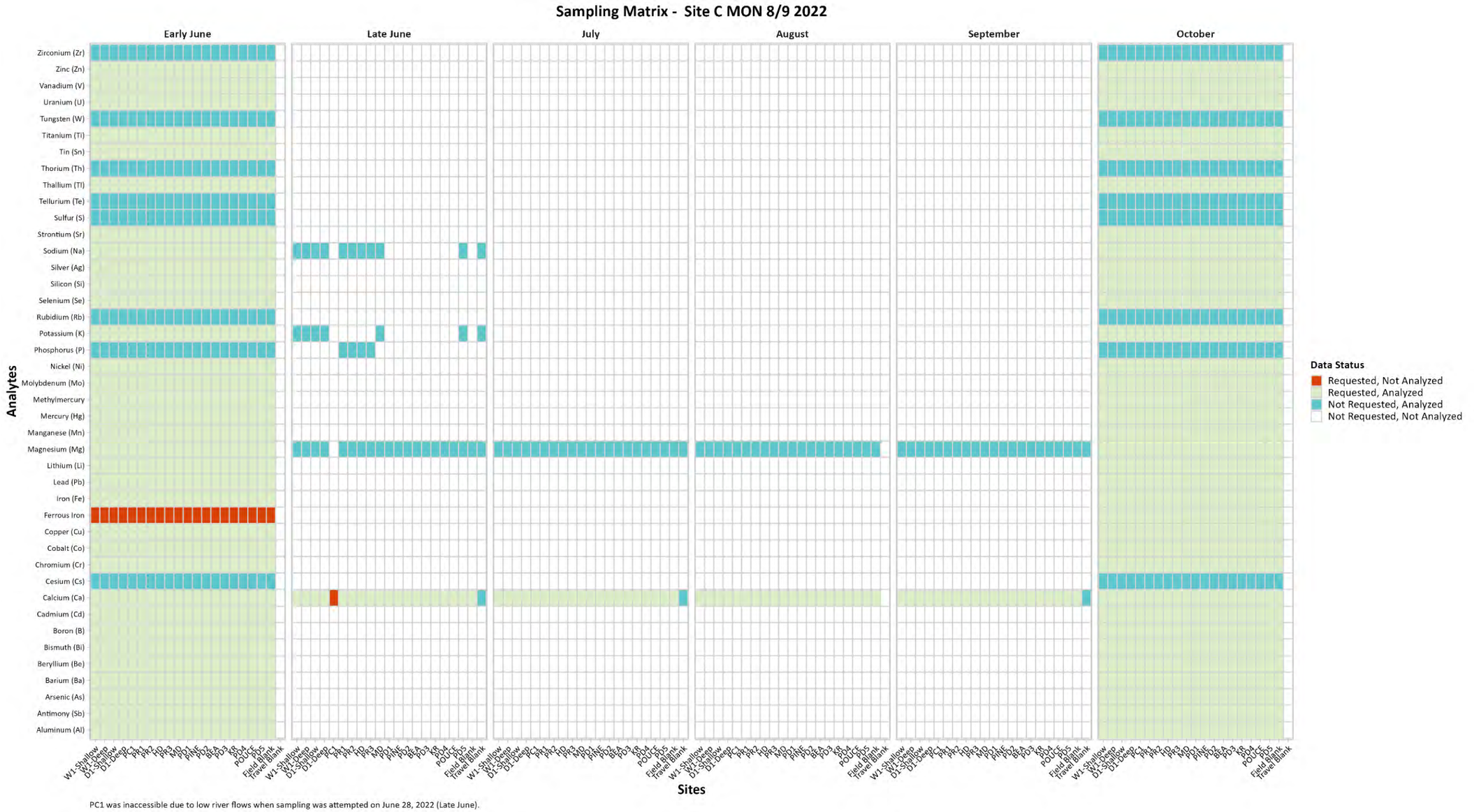
Figure 1. Sample matrix showing field measurements, physical tests, anions, nutrients, organic carbon, and chlorophyll-*a* water quality parameters analyzed at Mon-8/9 monitoring sites, including field and travel blanks, during 2022. "Requested" is defined as "Requested in the Request for Quotation".



PC1 was inaccessible due to low river flows when sampling was attempted on June 28, 2022 (Late June).

Figure 2. **Sample matrix showing dissolved metals water quality parameters analyzed at Mon-8/9 monitoring sites, including field and travel blanks, during 2022. "Requested" is defined as "Requested in the Request for Quotation".**



PC1 was inaccessible due to low river flows when sampling was attempted on June 28, 2022 (Late June).

Figure 3. Sample matrix showing total metals water quality parameters analyzed at Mon-8/9 monitoring sites, including field and travel blanks, during 2022. "Requested" is defined as "Requested in the Request for Quotation".

Figure 4. **Sample matrix showing physical tests, organic/inorganic carbon, particle size, anions, and nutrient sediment quality parameters analyzed at Mon-8/9 monitoring sites in 2022. "Requested" is defined as "Requested in the Request for Quotation".**

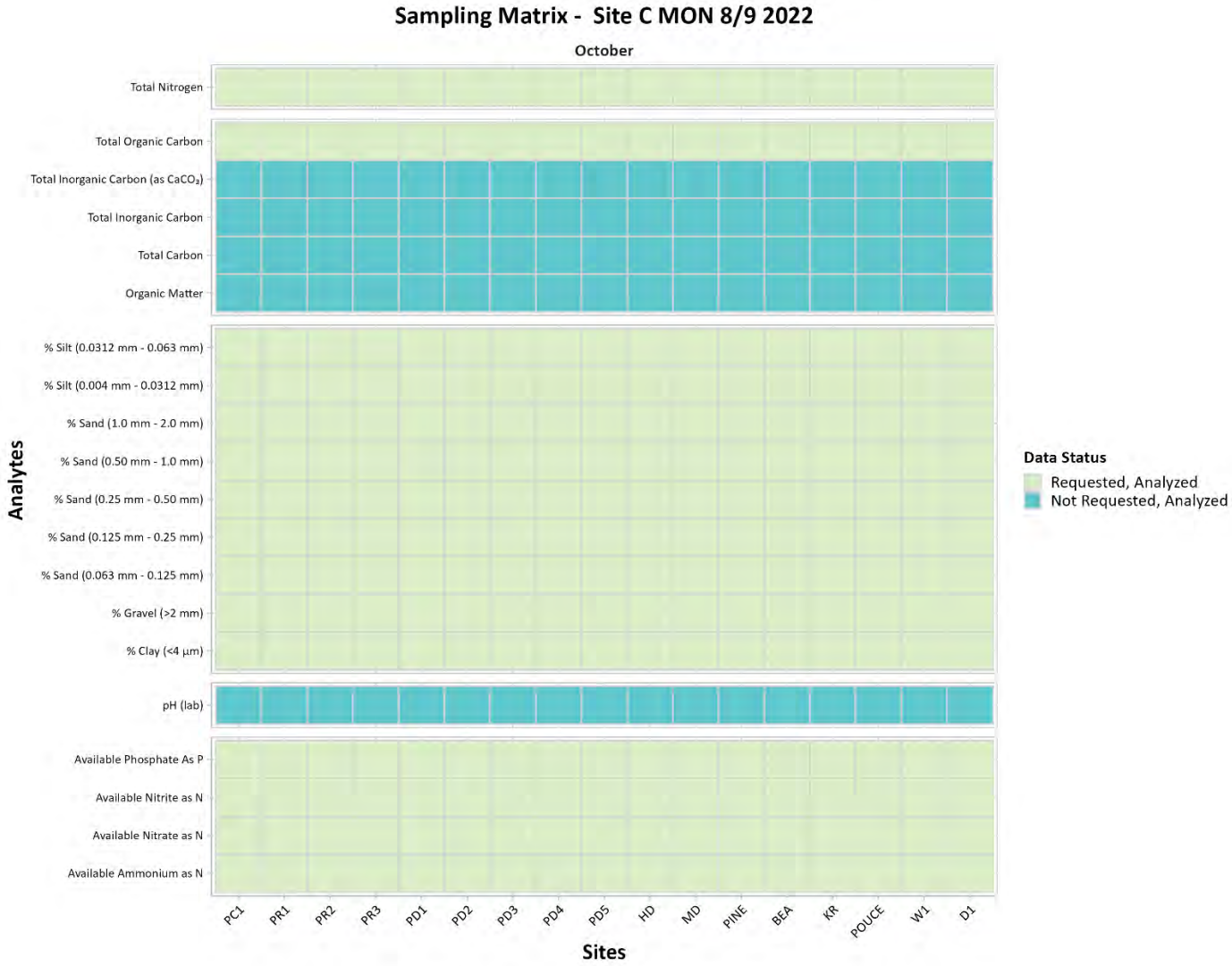


Figure 5. Sample matrix showing metals sediment quality parameters analyzed at Mon-8/9 monitoring sites in 2022. "Requested" is defined as "Requested in the Request for Quotation".

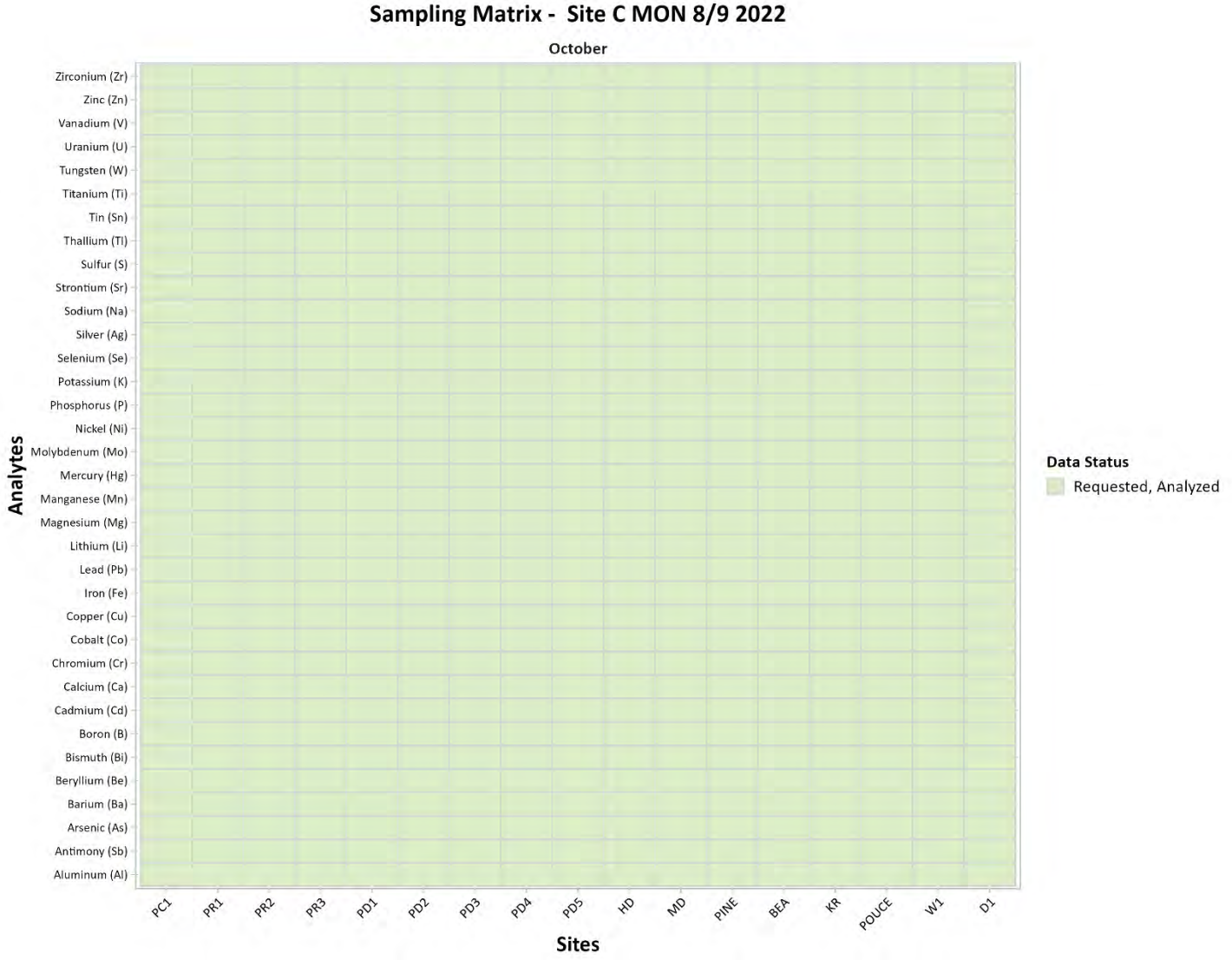


Table 1. Summary of water quality parameter hold time exceedances, 2022.

Date Sampled	Description	Site	Date Processed	Recommended Hold Time	Actual Hold Time	Qualifier
1-Jun-2022	Chlorophyll-*a*	W1-Deep	03-Jun-2022	2 days	2 days[1]	EHT
		W1-Shallow	03-Jun-2022	2 days	2 days[1]	EHT
4-Jun-2022	Chlorophyll-*a*	Travel Blank	08-Jun-2022	2 days	4 days	EHTR
	Colour, True	Travel Blank	08-Jun-2022	3 days	4 days	EHT
	Orthophosphate - Dissolved (as P)	Travel Blank	08-Jun-2022	3 days	4 days	EHT
	Nitrate (as N)	Travel Blank	08-Jun-2022	3 days	4 days	EHT
	Nitrite (as N)	Travel Blank	08-Jun-2022	3 days	4 days	EHT
29-Jun-2022	Orthophosphate - Dissolved (as P)	BEA-A	03-Jul-2022	3 days	4 days	EHT
		BEA-B	03-Jul-2022	3 days	4 days	EHT
		KR	03-Jul-2022	3 days	4 days	EHT
		PD1	03-Jul-2022	3 days	4 days	EHT
		PD2	03-Jul-2022	3 days	4 days	EHT
		PD2-FB	03-Jul-2022	3 days	4 days	EHT
		PD3	03-Jul-2022	3 days	4 days	EHT
		PD4	03-Jul-2022	3 days	4 days	EHT
		PINE	03-Jul-2022	3 days	4 days	EHT
		POUCE	03-Jul-2022	3 days	4 days	EHT
30-Jun-2022	Orthophosphate - Dissolved (as P)	PD5	08-Jul-2022	3 days	8 days	EHT
	Nitrate (as N)	PD5	08-Jul-2022	3 days	8 days	EHT
	Nitrite (as N)	PD5	08-Jul-2022	3 days	8 days	EHT
	Total Dissolved Solids	PD5	08-Jul-2022	7 days	8 days	EHT
	Total Suspended Solids	PD5	08-Jul-2022	7 days	8 days	EHT
17-Aug-2022	Colour, True	PC1	22-Aug-2022	3 days	5 days	EHT
		PR1	22-Aug-2022	3 days	5 days	EHT
	Orthophosphate - Dissolved (as P)	PC1	22-Aug-2022	3 days	5 days	EHT
		PR1	22-Aug-2022	3 days	5 days	EHT
	Nitrate (as N)	PC1	22-Aug-2022	3 days	5 days	EHT
		PR1	22-Aug-2022	3 days	5 days	EHT
	Nitrite (as N)	PC1	22-Aug-2022	3 days	5 days	EHT
		PR1	22-Aug-2022	3 days	5 days	EHT
18-Aug-2022	Colour, True	HD	22-Aug-2022	3 days	4 days	EHT
		PR2-A	22-Aug-2022	3 days	4 days	EHT
		PR2-B	22-Aug-2022	3 days	4 days	EHT
		PR3	22-Aug-2022	3 days	4 days	EHT
	Orthophosphate - Dissolved (as P)	HD	22-Aug-2022	3 days	4 days	EHT
		PR2-A	22-Aug-2022	3 days	4 days	EHT
		PR2-B	22-Aug-2022	3 days	4 days	EHT
		PR3	22-Aug-2022	3 days	4 days	EHT
	Nitrite (as N)	HD	22-Aug-2022	3 days	4 days	EHT
		PR2-A	22-Aug-2022	3 days	4 days	EHT
		PR2-B	22-Aug-2022	3 days	4 days	EHT
		PR3	22-Aug-2022	3 days	4 days	EHT
19-Aug-2022	Colour, True	BEA	25-Aug-2022	3 days	6 days	EHT
		PD1-A	25-Aug-2022	3 days	6 days	EHT
		PD1-B	25-Aug-2022	3 days	6 days	EHT
		PD2	25-Aug-2022	3 days	6 days	EHT
		PINE	25-Aug-2022	3 days	6 days	EHT
	Orthophosphate - Dissolved (as P)	BEA	25-Aug-2022	3 days	6 days	EHT
		PD1-A	25-Aug-2022	3 days	6 days	EHT
		PD1-B	25-Aug-2022	3 days	6 days	EHT
		PD2	25-Aug-2022	3 days	6 days	EHT
		PINE	25-Aug-2022	3 days	6 days	EHT
	Nitrate (as N)	BEA	25-Aug-2022	3 days	6 days	EHT
		PD1-A	25-Aug-2022	3 days	6 days	EHT
		PD1-B	25-Aug-2022	3 days	6 days	EHT
		PD2	25-Aug-2022	3 days	6 days	EHT
		PINE	25-Aug-2022	3 days	6 days	EHT
	Nitrite (as N)	BEA	25-Aug-2022	3 days	6 days	EHT
		PD1-A	25-Aug-2022	3 days	6 days	EHT
		PD1-B	25-Aug-2022	3 days	6 days	EHT
		PD2	25-Aug-2022	3 days	6 days	EHT
		PINE	25-Aug-2022	3 days	6 days	EHT
22-Sep-2022	Total Kjeldahl Nitrogen	PINE	26-Sep-2022	3 days	4 days	EHT
	Total Organic Carbon	PINE	26-Sep-2022	3 days	4 days	EHT

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHT: Exceeded ALS recommended hold time prior to analysis.

[1] Hold times were exceeded by less than 24 hours.

Table 1. Continued (2 of 2).

Date Sampled	Description	Site	Date Processed	Recommended Hold Time	Actual Hold Time	Qualifier
23-Sep-2022	Chlorophyll-*a*	D1-Deep	25-Sep-2022	48 hrs	49 hrs	EHT
		D1-Shallow	25-Sep-2022	48 hrs	49 hrs	EHT
		Travel Blank	25-Sep-2022	48 hrs	51 hrs	EHT
		W1-Deep	25-Sep-2022	48 hrs	51 hrs	EHT
		W1-Shallow	25-Sep-2022	48 hrs	51 hrs	EHT
17-Oct-2022	Ferrous Iron (Fe(II)) - Dissolved	BEA-A	24-Nov-2022	7 days	38 days	EHT
		BEA-B	24-Nov-2022	7 days	38 days	EHT
		KR	24-Nov-2022	7 days	38 days	EHT
		PD4	24-Nov-2022	7 days	38 days	EHT
		POUCE	24-Nov-2022	7 days	38 days	EHT
18-Oct-2022	Ferrous Iron (Fe(II)) - Dissolved	MD	24-Nov-2022	7 days	37 days	EHT
		MD-FB	24-Nov-2022	7 days	37 days	EHT
		PR3	24-Nov-2022	7 days	37 days	EHT
19-Oct-2022	Ferrous Iron (Fe(II)) - Dissolved	D1-Deep	24-Nov-2022	7 days	36 days	EHT
		D1-Shallow	24-Nov-2022	7 days	36 days	EHT
		W1-Deep	24-Nov-2022	7 days	36 days	EHT
		W1-Shallow	24-Nov-2022	7 days	36 days	EHT
20-Oct-2022	Ammonia, Total (as N)	Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Colour, True	PD2-A	25-Oct-2022	3 days	5 days	EHT
		PD2-B	25-Oct-2022	3 days	5 days	EHT
		PD3	25-Oct-2022	3 days	5 days	EHT
		PD5	25-Oct-2022	3 days	5 days	EHT
		Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Ferrous Iron (Fe(II)) - Dissolved	PD2-A	24-Nov-2022	7 days	35 days	EHT
		PD2-B	24-Nov-2022	7 days	35 days	EHT
		PD3	24-Nov-2022	7 days	35 days	EHT
		PD5	24-Nov-2022	7 days	35 days	EHT
	Orthophosphate - Dissolved (as P)	PD2-A	25-Oct-2022	3 days	5 days	EHT
		PD2-B	25-Oct-2022	3 days	5 days	EHT
		PD3	25-Oct-2022	3 days	5 days	EHT
		PD5	25-Oct-2022	3 days	5 days	EHT
		Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Nitrate (as N)	PD2-A	25-Oct-2022	3 days	5 days	EHT
		PD2-B	25-Oct-2022	3 days	5 days	EHT
		PD3	25-Oct-2022	3 days	5 days	EHT
		PD5	25-Oct-2022	3 days	5 days	EHT
		Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Nitrite (as N)	PD2-A	25-Oct-2022	3 days	5 days	EHT
		PD2-B	25-Oct-2022	3 days	5 days	EHT
		PD3	25-Oct-2022	3 days	5 days	EHT
		PD5	25-Oct-2022	3 days	5 days	EHT
		Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Total Nitrogen	Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Total Organic Carbon	Travel Blank	25-Oct-2022	3 days	5 days	EHT
	Phosphorus - Total	Travel Blank	25-Oct-2022	3 days	5 days	EHT
21-Oct-2022	Colour, True	HD	25-Oct-2022	3 days	4 days	EHT
		PC1	26-Oct-2022	3 days	5 days	EHT
		PR1	26-Oct-2022	3 days	5 days	EHT
		PR2	25-Oct-2022	3 days	4 days	EHT
	Ferrous Iron (Fe(II)) - Dissolved	HD	24-Nov-2022	7 days	34 days	EHT
		PC1	24-Nov-2022	7 days	34 days	EHT
		PR1	24-Nov-2022	7 days	34 days	EHT
		PR2	24-Nov-2022	7 days	34 days	EHT
	Orthophosphate - Dissolved (as P)	HD	25-Oct-2022	3 days	4 days	EHT
		PC1	25-Oct-2022	3 days	4 days	EHT
		PR1	25-Oct-2022	3 days	4 days	EHT
		PR2	25-Oct-2022	3 days	4 days	EHT
	Nitrate (as N)	HD	25-Oct-2022	3 days	4 days	EHT
		PC1	25-Oct-2022	3 days	4 days	EHT
		PR1	25-Oct-2022	3 days	4 days	EHT
		PR2	25-Oct-2022	3 days	4 days	EHT
	Nitrite (as N)	HD	25-Oct-2022	3 days	4 days	EHT
		PC1	25-Oct-2022	3 days	4 days	EHT
		PR1	25-Oct-2022	3 days	4 days	EHT
		PR2	25-Oct-2022	3 days	4 days	EHT
22-Oct-2022	Ferrous Iron (Fe(II)) - Dissolved	PD1	24-Nov-2022	7 days	33 days	EHT
		PINE	24-Nov-2022	7 days	33 days	EHT

EHT: Exceeded ALS recommended hold time prior to analysis.

Table 2. Water quality monitoring field blank results for organic/inorganic carbon, physical tests, anions, and nutrients, 2022.

Date	Units	2-Jun-2022	29-Jun-2022	27-Jul-2022	24-Aug-2022	20-Sep-2022	18-Oct-2022	21-Oct-2022
QA/QC Sample		HD-FB	PD2-FB	PD1-FB	MD-FB	PD5-FB	PR3-FB	PR2-FB[1]
Organic / Inorganic Carbon								
Dissolved Organic Carbon	mg/L	0.74	<0.50	<0.50	<0.50	<0.50	1.22	
Total Carbon[2]	mg/L							<0.71
Total Inorganic Carbon[2]	mg/L							<0.50
Total Organic Carbon	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	1.27	<0.50
Physical Tests								
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Alkalinity, Total (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	
Colour, True	TCU[3]	<5.0		<5.0	<5.0	<5.0	<5.0	
Electrical Conductivity (lab)	µS/cm	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Dissolved Hardness (as $CaCO_3$)	mg/L	<0.50	<0.60	<0.50	<0.60	<0.60	<0.50	
Total Dissolved Solids	mg/L	<10	<10	<10	<10	<10	<10	
Total Suspended Solids	mg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	
pH (lab)	pH units	5.57	5.25	5.37	5.69	5.18	5.58	

Yellow shading indicates a field or travel blank detection. pH is always detectable; therefore, pH values are not shaded in yellow.

Blank cells indicate no data were collected.

[1] Equipment blank associated with sediment samples.

[2] Parameters analyzed for equipment blank only.

[3] TCU = True Colour Units.

Table 2. Continued (2 of 2).

Date	Units	2-Jun-2022	29-Jun-2022	27-Jul-2022	24-Aug-2022	20-Sep-2022	18-Oct-2022	21-Oct-2022
QA/QC Sample		**HD-FB**	**PD2-FB**	**PD1-FB**	**MD-FB**	**PD5-FB**	**PR3-FB**	**PR2-FB[1]**
Anions and Nutrients								
Ammonia, Total (as N)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0116	<0.0050
Chloride (Total)	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Orthophosphate - Dissolved (as P)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Phosphorus (P) - Total	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0053
Phosphorus (P) - Total Dissolved	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
Silicate (as SiO_2)	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50	
Sulfate (SO_4)	mg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Total Kjeldahl Nitrogen	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Total Nitrogen	mg/L	<0.030	<0.030	<0.050	<0.030	<0.050	<0.030	<0.030
Ion Balance								
Anion Sum	mEq/L		<0.10		<0.10	<0.10	<0.10	
Cation - Anion Balance	% difference		<0.010		<0.010	<0.010	<0.010	
Cation Sum	mEq/L		<0.10		<0.10	<0.10	<0.10	

Yellow shading indicates a field or travel blank detection. pH is always detectable; therefore, pH values are not shaded in yellow.
Blank cells indicate no data were collected.

[1] Equipment blank associated with sediment samples.

[2] Parameters analyzed for equipment blank only.

[3] TCU = True Colour Units.

Table 3. Water quality monitoring field blank results for dissolved metals, 2022.

Date	2-Jun-2022	29-Jun-2022	27-Jul-2022	24-Aug-2022	20-Sep-2022	18-Oct-2022
QA/QC Sample	**HD-FB**	**PD2-FB**	**PD1-FB**	**MD-FB**	**PD5-FB**	**PR3-FB**
Dissolved Metals (mg/L)						
Aluminum (Al) - Dissolved	<0.0010					0.0033
Antimony (Sb) - Dissolved	<0.00010					<0.00010
Arsenic (As) - Dissolved	<0.00010					<0.00010
Barium (Ba) - Dissolved	<0.00010					<0.00010
Beryllium (Be) - Dissolved	<0.000020					<0.000020
Bismuth (Bi) - Dissolved	<0.000050					<0.000050
Boron (B) - Dissolved	<0.010					<0.010
Cadmium (Cd) - Dissolved	<0.0000050					0.0000057
Calcium (Ca) - Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cesium (Cs) - Dissolved	<0.000010					<0.000010
Chromium (Cr) - Dissolved	<0.00050					<0.00050
Cobalt (Co) - Dissolved	<0.00010					<0.00010
Copper (Cu) - Dissolved	<0.00020					<0.00020
Ferrous Iron (Fe(II)) - Dissolved						<0.020
Iron (Fe) - Dissolved	0.016					<0.010
Lead (Pb) - Dissolved	<0.000050					<0.000050
Lithium (Li) - Dissolved	<0.0010					<0.0010
Magnesium (Mg) - Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Manganese (Mn) - Dissolved	0.00017					0.00014
Mercury (Hg) - Dissolved	<0.00000050					<0.00000050
Methylmercury (MeHg) - Dissolved	<0.000000020					<0.000000020

Yellow shading indicates a field or travel blank detection.
Blank cells indicate no data were collected.
Dissolved metals analyses were not within scope for the late June, July, August, and September sampling events; dissolved calcium and magnesium were analyzed to enable the calculation of dissolved hardness.

Table 3. Continued (2 of 2).

Date	2-Jun-2022	29-Jun-2022	27-Jul-2022	24-Aug-2022	20-Sep-2022	18-Oct-2022
QA/QC Sample	**HD-FB**	**PD2-FB**	**PD1-FB**	**MD-FB**	**PD5-FB**	**PR3-FB**
Dissolved Metals (mg/L)						
Molybdenum (Mo) - Dissolved	<0.000050					<0.000050
Nickel (Ni) - Dissolved	<0.00050					<0.00050
Phosphorus (P) - Dissolved	<0.050					<0.050
Potassium (K) - Dissolved	<0.050					<0.050
Rubidium (Rb) - Dissolved	<0.00020					<0.00020
Selenium (Se) - Dissolved	<0.000050					<0.000050
Silicon (Si) - Dissolved	<0.050					<0.050
Silver (Ag) - Dissolved	<0.000010					<0.000010
Sodium (Na) - Dissolved	<0.050					<0.050
Strontium (Sr) - Dissolved	<0.00020					<0.00020
Sulfur (S) - Dissolved	<0.50					<0.50
Tellurium (Te) - Dissolved	<0.00020					<0.00020
Thallium (Tl) - Dissolved	<0.000010					<0.000010
Thorium (Th) - Dissolved	<0.00010					<0.00010
Tin (Sn) - Dissolved	<0.00010					<0.00010
Titanium (Ti) - Dissolved	<0.00030					<0.00030
Tungsten (W) - Dissolved	<0.00010					<0.00010
Uranium (U) - Dissolved	<0.000010					<0.000010
Vanadium (V) - Dissolved	<0.00050					<0.00050
Zinc (Zn) - Dissolved	<0.0010					<0.0010
Zirconium (Zr) - Dissolved	<0.00030					<0.00030

Yellow shading indicates a field or travel blank detection.
Blank cells indicate no data were collected.
Dissolved metals analyses were not within scope for the late June, July, August, and September sampling events; dissolved calcium and magnesium were analyzed to enable the calculation of dissolved hardness.

Table 4. Water quality monitoring field blank results for total metals, 2022.

Date	2-Jun-2022	18-Oct-2022	21-Oct-2022
QA/QC Sample	**HD-FB**	**PR3-FB**	**PR2-FB[1]**
Total Metals (mg/L)			
Aluminum (Al) - Total	<0.0030	<0.0030	0.0548
Antimony (Sb) - Total	<0.00010	<0.00010	<0.00010
Arsenic (As) - Total	<0.00010	<0.00010	<0.00010
Barium (Ba) - Total	<0.00010	<0.00010	0.00174
Beryllium (Be) - Total	<0.000020	<0.000020	<0.000100
Bismuth (Bi) - Total	<0.000050	<0.000050	<0.000050
Boron (B) - Total	<0.010	<0.010	<0.010
Cadmium (Cd) - Total	<0.0000050	<0.0000050	0.0000072
Calcium (Ca) - Total	<0.050	<0.050	0.132
Cesium (Cs) - Total	<0.000010	<0.000010	<0.000010
Chromium (Cr) - Total	<0.00050	<0.00050	0.00144
Cobalt (Co) - Total	<0.00010	<0.00010	<0.00010
Copper (Cu) - Total	<0.00050	<0.00050	<0.00050
Iron (Fe) - Total	<0.010	<0.010	0.080
Lead (Pb) - Total	<0.000050	<0.000050	<0.000050
Lithium (Li) - Total	<0.0010	<0.0010	<0.0010
Magnesium (Mg) - Total	<0.0050	<0.0050	0.0374
Manganese (Mn) - Total	<0.00010	<0.00010	0.00185
Mercury (Hg) - Total	<0.00000050	<0.00000050	<0.0000050
Methylmercury (MeHg) - Total	<0.000000020	<0.000000020	
Molybdenum (Mo) - Total	<0.000050	<0.000050	0.000167
Nickel (Ni) - Total	<0.00050	<0.00050	0.00102
Phosphorus (P) - Total	<0.050	<0.050	<0.050
Potassium (K) - Total	<0.050	<0.050	<0.050
Rubidium (Rb) - Total	<0.00020	<0.00020	<0.00020
Selenium (Se) - Total	<0.000050	<0.000050	<0.000050
Silicon (Si) - Total	<0.10	<0.10	0.13
Silver (Ag) - Total	<0.000010	<0.000010	<0.000010

Yellow shading indicates a field or travel blank detection.
Blank cells indicate no data were collected.

[1] Field equipment blank associated with sediment samples.

Table 4. Continued (2 of 2).

Date	2-Jun-2022	18-Oct-2022	21-Oct-2022
QA/QC Sample	**HD-FB**	**PR3-FB**	**PR2-FB[1]**
Total Metals (mg/L)			
Sodium (Na) - Total	<0.050	<0.050	<0.050
Strontium (Sr) - Total	<0.00020	<0.00020	0.00035
Sulfur (S) - Total	<0.50	<0.50	<0.50
Tellurium (Te) - Total	<0.00020	<0.00020	<0.00020
Thallium (Tl) - Total	<0.000010	<0.000010	<0.000010
Thorium (Th) - Total	<0.00010	<0.00010	<0.00010
Tin (Sn) - Total	<0.00010	<0.00010	0.00022
Titanium (Ti) - Total	<0.00030	<0.00030	<0.00150
Tungsten (W) - Total	<0.00010	<0.00010	<0.00010
Uranium (U) - Total	<0.000010	<0.000010	<0.000010
Vanadium (V) - Total	<0.00050	<0.00050	<0.00050
Zinc (Zn) - Total	<0.0030	<0.0030	<0.0030
Zirconium (Zr) - Total	<0.00020	<0.00020	<0.00020

Yellow shading indicates a field or travel blank detection.
Blank cells indicate no data were collected.

[1] Field equipment blank associated with sediment samples.

Table 5. Water quality monitoring travel blank results for organic carbon, physical tests, anions, nutrients, and dissolved metals, 2022.

QA/QC Sample	Units	Travel Blank					
Date		4-Jun-2022	27-Jun-2022	25-Jul-2022	24-Aug-2022	23-Sep-2022	20-Oct-2022
Organic Carbon							
Total Organic Carbon	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Physical Tests							
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Colour, True	TCU[1]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Conductivity (lab)	µS/cm	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dissolved Hardness (as $CaCO_3$)	mg/L		<0.50	<0.50		<0.60	
Total Dissolved Solids	mg/L	<10	<10	<10	<10	<10	<10
Total Suspended Solids	mg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
pH (lab)	pH units	5.31	5.63	5.57	5.59	5.33	5.44
Anions and Nutrients							
Ammonia, Total (as N)	mg/L	<0.0050	<0.0050	<0.0050	0.0071	<0.0050	<0.0050
Chloride (Total)	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Yellow shading indicates a field or travel blank detection. pH is always detectable; therefore, pH values are not shaded in yellow.
Blank cells indicate no data were collected.

[1] TCU = True Colour Units.

Table 5. Continued (2 of 2).

QA/QC Sample	Units	Travel Blank					
Date		**4-Jun-2022**	**27-Jun-2022**	**25-Jul-2022**	**24-Aug-2022**	**23-Sep-2022**	**20-Oct-2022**
Anions and Nutrients							
Orthophosphate - Dissolved (as P)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P) - Total Dissolved	mg/L					<0.0020	
Silicate (as SiO_2)	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Sulfate (SO_4)	mg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Total Kjeldahl Nitrogen	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Total Nitrogen	mg/L	<0.030	<0.050	<0.050	<0.030		<0.030
Plant Pigments							
Chlorophyll-*a*	µg/L	<0.010	<0.028	<0.028	<0.028[2]	<0.010	<0.010[3]
Ion Balance							
Anion Sum	mEq/L		<0.10			<0.10	<0.10
Cation - Anion Balance	% difference		<0.010			<0.010	<0.010
Cation Sum	mEq/L		<0.10			<0.10	<0.10
Dissolved Metals							
Calcium (Ca) - Dissolved	mg/L		<0.050	<0.050		<0.050	
Magnesium (Mg) - Dissolved	mg/L		<0.0050	<0.0050		<0.0050	
Potassium (K) - Dissolved	mg/L		<0.050				
Sodium (Na) - Dissolved	mg/L		<0.050				

Yellow shading indicates a field or travel blank detection. pH is always detectable; therefore, pH values are not shaded in yellow.
Blank cells indicate no data were collected.

[1] TCU = True Colour Units.

[2] Analyzed in travel blank collected on August 16, 2022.

[3] Analyzed in travel blank collected on October 19, 2022.

Table 6. Water quality monitoring travel blank results for total metals, 2022.

QA/QC Sample	Travel Blank	
Date	**4-Jun-2022**	**20-Oct-2022**
Total Metals (mg/L)		
Aluminum (Al) - Total	<0.0030	<0.0030
Antimony (Sb) - Total	<0.00010	<0.00010
Arsenic (As) - Total	<0.00010	<0.00010
Barium (Ba) - Total	<0.00010	<0.00010
Beryllium (Be) - Total	<0.000020	<0.000020
Bismuth (Bi) - Total	<0.000050	<0.000050
Boron (B) - Total	<0.010	<0.010
Cadmium (Cd) - Total	<0.0000050	<0.0000050
Calcium (Ca) - Total	<0.050	<0.050
Cesium (Cs) - Total	<0.000010	<0.000010
Chromium (Cr) - Total	<0.00050	<0.00050
Cobalt (Co) - Total	<0.00010	<0.00010
Copper (Cu) - Total	<0.00050	<0.00050
Iron (Fe) - Total	<0.010	<0.010
Lead (Pb) - Total	<0.000050	<0.000050
Lithium (Li) - Total	<0.0010	<0.0010
Magnesium (Mg) - Total	<0.0050	<0.0050
Manganese (Mn) - Total	<0.00010	<0.00010
Mercury (Hg) - Total	<0.0000100	<0.00000050
Methylmercury (MeHg) - Total	<0.000000020	<0.000000020
Molybdenum (Mo) - Total	<0.000050	<0.000050
Nickel (Ni) - Total	<0.00050	<0.00050
Phosphorus (P) - Total	<0.050	<0.050
Potassium (K) - Total	<0.050	<0.050
Rubidium (Rb) - Total	<0.00020	<0.00020
Selenium (Se) - Total	<0.000050	<0.000050
Silicon (Si) - Total	<0.10	<0.10
Silver (Ag) - Total	<0.000010	<0.000010
Sodium (Na) - Total	<0.050	<0.050

No blank detections (values >MDL) occurred.

Table 6. Continued (2 of 2).

QA/QC Sample	Travel Blank	
Date	**4-Jun-2022**	**20-Oct-2022**
Total Metals (mg/L)		
Strontium (Sr) - Total	<0.00020	<0.00020
Sulfur (S) - Total	<0.50	<0.50
Tellurium (Te) - Total	<0.00020	<0.00020
Thallium (Tl) - Total	<0.000010	<0.000010
Thorium (Th) - Total	<0.00010	<0.00010
Tin (Sn) - Total	<0.00010	<0.00010
Titanium (Ti) - Total	<0.00030	<0.00030
Tungsten (W) - Total	<0.00010	<0.00010
Uranium (U) - Total	<0.000010	<0.000010
Vanadium (V) - Total	<0.00050	<0.00050
Zinc (Zn) - Total	<0.0030	<0.0030
Zirconium (Zr) - Total	<0.00020	<0.00020

No blank detections (values >MDL) occurred.

Table 7. Summary of cases with relative percent difference >20% for duplicate water quality samples, 2022.

Date	Site	Parameter	Replicate A (mg/L)	Replicate B (mg/L)	Method Detection Limit (mg/L)	Relative Percent Difference (%)
2-Jun-2022	PC1	Selenium (Se) - Dissolved	0.000335	0.000246	0.0000500	30.6
		Total Suspended Solids	24.3	16.5	3.00	38.2
		Selenium (Se) - Total	0.000212	0.000359	0.0000500	51.5
		Titanium (Ti) - Total	0.00784	0.0108	0.000300	31.8
	PR1	Aluminum (Al) - Dissolved	0.0232	0.0305	0.00100	27.2
		Selenium (Se) - Dissolved	0.000220	0.000290	0.0000500	27.5
29-Jun-2022	BEA	Ammonia, Total (as N)	0.0378	0.0278	0.00500	30.5
27-Jul-2022	PINE	Phosphorus (P) - Total[1]	0.0214	0.0139	0.0020	42.5
		Total Kjeldahl Nitrogen	0.340	0.0550	0.0500	144
		Total Nitrogen	0.362	0.0720	0.050	134
		Total Organic Carbon	2.83	1.58	0.500	56.7
		Total Suspended Solids	19.1	12.7	3.00	40.3
21-Sep-2022	HD	Dissolved Organic Carbon	3.44	2.79	0.500	20.9
17-Oct-2022	BEA	Iron (Fe) - Dissolved	0.0460	0.0660	0.0100	35.7
		Mercury (Hg) - Dissolved	0.00000212	0.00000279	0.000000500	27.3
		Methylmercury (MeHg) - Total	0.000000074	0.00000013	0.000000020	54.9
20-Oct-2022	PD2	Aluminum (Al) - Dissolved	0.00420	0.00750	0.00100	56.4
		Phosphorus (P) - Total[1]	0.0156	0.0212	0.0020	30.4
		Titanium (Ti) - Total	0.00293	0.00225	0.000300	26.3

Shading indicates that the replicate is less than 5 times the ALS method detection limit.

[1]Analyzed by colourimetry.

Table 8. Summary of cases with a relative standard deviation >18% for triplicate water quality samples, 2022.

Parameter	Date	Site	Replicate A	Replicate B	Replicate C	Relative Standard Deviation (%)
Turbidity (in situ, NTU)	4-Jun-2022	PD4	1,033.97[1]	282.31	262.60	83.6
	29-Jun-2022	PD3	125.03	90.61	93.07	18.7
	26-Jul-2022	PC1	0.37	0.32	2.18	110.0
		PR1	0.50	0.52	0.36	19.6
	27-Jul-2022	PD3	35.99	52.52	91.07	47.2
	19-Sep-2022	PD3	297.85	224.27	322.03	18.1
	21-Sep-2022	PR2	2.39	1.50	1.71	25.1
	22-Sep-2022	PINE	4.11	2.93	3.14	18.6
	20-Oct-2022	PD5	7.34	10.38	7.57	20.0
	21-Oct-2022	PR2	4.11	2.71	10.82	73.8
	22-Oct-2022	PD1	3.49	6.31	5.36	28.3

[1] Identified as an outlier and excluded from all analyses.

Table 9. Summary of cases where the dissolved concentration to total concentration ratio was >1.2, 2022.

Date	Site	Parameter	Total Concentration (mg/L)	Dissolved Concentration (mg/L)	Total MDL (mg/L)	Dissolved MDL (mg/L)	Ratio Dissolved/Total Concentration
1-Jun-2022	D1-Deep	Molybdenum (Mo)	0.000417	0.000720	0.000050	0.000050	1.73
	D1-Shallow	Molybdenum (Mo)	0.000593	0.000760	0.000050	0.000050	1.28
	W1-Deep	Selenium (Se)	0.000282	0.000353	0.000050	0.000050	1.25
2-Jun-2022	PC1[1]	Selenium (Se)	0.000212	0.000335	0.000050	0.000050	1.58
17-Oct-2022	BEA[1]	Methylmercury (MeHg)	0.000000074	0.000000125	0.000000020	0.000000020	1.69
18-Oct-2022	MD	Organic Carbon	3.21	3.97	0.50	0.50	1.24
	PR3	Organic Carbon	2.83	3.77	0.50	0.50	1.33
19-Oct-2022	D1-Shallow	Selenium (Se)	0.000211	0.000281	0.000050	0.000050	1.33

Shading indicates that the replicate is less than 5 times the MDL. Precision of the analytical result decreases when the concentration is close to the MDL.

[1] Duplicate samples were collected at this site; results correspond to Replicate A only.

Table 10. Summary of cases with relative percent difference >20% for duplicate sediment quality samples, 2022.

Date	Site	Parameter	Unit	Replicate A	Replicate B	Method Detection Limit	Relative Percent Difference (%)
21-Oct-2022	PC1	% Clay (<4 µm)	%	4.0	5.7	1.0	35.1
		% Sand (0.125 mm - 0.25 mm)	%	3.9	5.8	1.1	39.2
		% Sand (0.25 mm - 0.50 mm)	%	4.8	8.0	1.2	50.0
		% Sand (1.0 mm - 2.0 mm)	%	28.4	18.8	1.3	40.7
		% Silt (0.004 mm - 0.0312 mm)	%	5.8	8.7	1.4	40.0
		Aluminum (Al)	mg/kg	12,600	16,400	50	26.2
		Beryllium (Be)	mg/kg	0.52	0.64	0.10	20.7
		Calcium (Ca)	mg/kg	16,800	11,100	50	40.9
		Copper (Cu)	mg/kg	32.0	42.4	0.50	28.0
		Lead (Pb)	mg/kg	8.84	11.0	0.50	21.8
		Lithium (Li)	mg/kg	23.8	34.5	2.0	36.7
		Strontium (Sr)	mg/kg	53.8	43.3	0.50	21.6
		Titanium (Ti)	mg/kg	100	47.2	1.0	71.7
		Zinc (Zn)	mg/kg	86.0	106	2.0	20.8

Shading indicates that the replicate is less than 5 times the ALS method detection limit.

Appendix D. 2022 ALS Environmental Laboratory Reports for Water Quality Sampling

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201394**	Page	: 1 of 6
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 01-Jun-2022 12:57
PO	: 5200-25.01.01	Date Analysis Commenced	: 02-Jun-2022
C-O-C number	: 2022-June-MON8/9	Issue Date	: 08-Jul-2022 17:13
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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 Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLB	*Detection Limit Raised. Analyte detected at comparable level in Method Blank.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTMF	*Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Deep	W1-Shallow	D1-Deep	D1-Shallow	----
					Client sampling date / time	01-Jun-2022 07:40	01-Jun-2022 08:50	01-Jun-2022 10:30	01-Jun-2022 11:00	----
						FJ2201394-001	FJ2201394-002	FJ2201394-003	FJ2201394-004	--------
						Result	Result	Result	Result	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		85.1	84.7	83.5	83.6	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		85.1	84.7	83.5	83.6	----
colour, true	----	E329	5.0	CU		7.4	12.1	13.5	10.8	----
conductivity	----	E100	2.0	µS/cm		189	192	189	189	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		96.0	94.7	94.4	95.8	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L		97.7	97.1	96.3	96.3	----
pH	----	E108	0.10	pH units		8.11	8.12	8.10	8.11	----
solids, total dissolved [TDS]	----	E162	10	mg/L		108	112	118	115	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	<3.0	18.0	11.0	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	<0.0050	0.0143	0.0155	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.043	0.042	0.046	0.045	----
Kjeldahl nitrogen, total [TKN]	----	EC318	0.050	mg/L		0.061	0.074	0.093	0.082	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0763	0.0774	0.0833	0.0782	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
nitrogen, total	7727-37-9	E366	0.030	mg/L		0.137	0.151	0.176	0.160	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	0.0022	0.0015	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		<0.0020	<0.0020	0.0478	0.0028 RRV	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0026	0.0024	0.0038	0.0332	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		15.3	15.2	14.7	15.0	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0032	mg/L		0.0763	0.0774	0.0833	0.0782	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.92	2.64	3.74	3.77	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.49	2.58	4.11	3.20	----
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.0135	0.0197	0.168	0.333	----
antimony, total	7440-36-0	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Deep	W1-Shallow	D1-Deep	D1-Shallow	----
					Client sampling date / time	01-Jun-2022 07:40	01-Jun-2022 08:50	01-Jun-2022 10:30	01-Jun-2022 11:00	----
						FJ2201394-001	FJ2201394-002	FJ2201394-003	FJ2201394-004	--------
						Result	Result	Result	Result	----
Total Metals										
arsenic, total	7440-38-2	E420	0.00010	mg/L		0.00019	0.00020	0.00034	0.00035	----
barium, total	7440-39-3	E420	0.00010	mg/L		0.0302	0.0301	0.0644	0.0570	----
beryllium, total	7440-41-7	E420	0.000020	mg/L		<0.000020	<0.000020	0.000022	0.000022	----
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
boron, total	7440-42-8	E420	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L		0.0000170	0.0000146	0.0000534	0.0000456	----
calcium, total	7440-70-2	E420	0.050	mg/L		29.2	28.7	28.0	28.1	----
cesium, total	7440-46-2	E420	0.000010	mg/L		<0.000010	<0.000010	0.000037	0.000066	----
chromium, total	7440-47-3	E420	0.00050	mg/L		<0.00050	<0.00050	<0.00050	0.00071	----
cobalt, total	7440-48-4	E420	0.00010	mg/L		<0.00010	<0.00010	0.00028	0.00024	----
copper, total	7440-50-8	E420	0.00050	mg/L		0.00063	0.00064	0.00135	0.00116	----
iron, total	7439-89-6	E420	0.010	mg/L		0.018	0.024	0.376	0.399	----
lead, total	7439-92-1	E420	0.000050	mg/L		<0.000050	<0.000050	0.000460	0.000364	----
lithium, total	7439-93-2	E420	0.0010	mg/L		0.0012	0.0012	0.0016	0.0016	----
magnesium, total	7439-95-4	E420	0.0050	mg/L		6.03	6.18	6.40	6.34	----
manganese, total	7439-96-5	E420	0.00010	mg/L		0.00176	0.00178	0.0132	0.00977	----
mercury, total	7439-97-6	E508-L	0.50	ng/L		<0.50	<0.50	3.74	2.49	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.000826	0.000841	0.000417	0.000593	----
nickel, total	7440-02-0	E420	0.00050	mg/L		0.00081	0.00080	0.00192	0.00150	----
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
potassium, total	7440-09-7	E420	0.050	mg/L		0.430	0.418	0.515	0.549	----
rubidium, total	7440-17-7	E420	0.00020	mg/L		0.00033	0.00026	0.00067	0.00095	----
selenium, total	7782-49-2	E420	0.000050	mg/L		0.000282	0.000344	0.000267	0.000309	----
silicon, total	7440-21-3	E420	0.10	mg/L		2.46	2.31	2.48	2.95	----
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000030 DLB	<0.000030 DLB	<0.000020 DLB	<0.000020 DLB	----
sodium, total	7440-23-5	E420	0.050	mg/L		1.12	1.07	1.20	1.13	----
strontium, total	7440-24-6	E420	0.00020	mg/L		0.123	0.122	0.120	0.124	----
sulfur, total	7704-34-9	E420	0.50	mg/L		4.96	4.80	4.94	4.90	----
tellurium, total	13494-80-9	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
thorium, total	7440-29-1	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Deep	W1-Shallow	D1-Deep	D1-Shallow	----
					Client sampling date / time	01-Jun-2022 07:40	01-Jun-2022 08:50	01-Jun-2022 10:30	01-Jun-2022 11:00	----
						FJ2201394-001	FJ2201394-002	FJ2201394-003	FJ2201394-004	--------
						Result	Result	Result	Result	----
Total Metals										
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
titanium, total	7440-32-6	E420	0.00030	mg/L		<0.00030	<0.00060 DLM	0.00156	<0.00810 DLM	----
tungsten, total	7440-33-7	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
uranium, total	7440-61-1	E420	0.000010	mg/L		0.000485	0.000476	0.000514	0.000511	----
vanadium, total	7440-62-2	E420	0.00050	mg/L		<0.00050	<0.00050	0.00099	0.00150	----
zinc, total	7440-66-6	E420	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	----
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	0.00040	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0040	0.0038	0.0188	0.0169	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00016	0.00016	0.00017	0.00018	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0308	0.0302	0.0409	0.0365	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
boron, dissolved	7440-42-8	E421	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.0000106	0.0000145	0.0000154	0.0000160	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L		28.6	28.1	27.8	28.2	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00063	0.00062	0.00071	0.00066	----
iron, dissolved	7439-89-6	E421	0.010	mg/L		<0.010	<0.010	0.031	0.019	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0011	0.0011	0.0013	0.0013	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		5.97	5.95	6.08	6.16	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.00092	0.00080	0.00273	0.00203	----
mercury, dissolved	7439-97-6	E509-L	0.50	ng/L		<0.50	<0.50	0.96	0.85	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.000792	0.000816	0.000720 DTMF	0.000760	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00076	0.00076	0.00087	0.00083	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.443	0.425	0.455	0.450	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Deep	W1-Shallow	D1-Deep	D1-Shallow	----
					Client sampling date / time	01-Jun-2022 07:40	01-Jun-2022 08:50	01-Jun-2022 10:30	01-Jun-2022 11:00	----
						FJ2201394-001	FJ2201394-002	FJ2201394-003	FJ2201394-004	--------
						Result	Result	Result	Result	----
Dissolved Metals										
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00029	0.00028	0.00026	0.00025	----
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000353	0.000307	0.000275	0.000291	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L		2.32	2.26	2.26	2.33	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1.10	1.10	1.13	1.14	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.112	0.110	0.109	0.108	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		5.04	4.87	4.72	4.91	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		<0.00030	<0.00030	0.00031	0.00030	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000464	0.000477	0.000464	0.000473	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
dissolved MeHg filtration location	----	EP537	-	-		Field	Field	Field	Field	----
dissolved mercury filtration location	----	EP509-L	-	-		Field	Field	Field	Field	----
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	----
Speciated Metals										
methylmercury (as MeHg), total	22967-92-6	E536	0.000000020	mg/L		<0.000000020	0.000000038	0.000000038	0.000000026	----
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000000020	mg/L		<0.000000020	<0.000000020	<0.000000020	<0.000000020	----
Plant Pigments										
chlorophyll a	479-61-8	E870	0.010	µg/L		0.782	0.795	0.946	0.838	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201394**	Page	: 1 of 23
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 01-Jun-2022 12:57
PO	: 5200-25.01.01	Issue Date	: 08-Jul-2022 17:13
C-O-C number	: 2022-June-MON8/9		
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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 Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value 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
Method Blank (MB) Values								
Total Metals	QC-518879-001	----	magnesium, total	7439-95-4	E420	0.0092 B mg/L	0.005 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
D1-Deep	E298	01-Jun-2022	15-Jun-2022	----	----		17-Jun-2022	28 days	16 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
D1-Shallow	E298	01-Jun-2022	15-Jun-2022	----	----		17-Jun-2022	28 days	16 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W1-Deep	E298	01-Jun-2022	15-Jun-2022	----	----		17-Jun-2022	28 days	16 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
W1-Shallow	E298	01-Jun-2022	15-Jun-2022	----	----		17-Jun-2022	28 days	16 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
D1-Deep	E235.Cl	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
D1-Shallow	E235.Cl	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
W1-Deep	E235.Cl	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE W1-Shallow	E235.Cl	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Deep	E378-U	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Shallow	E378-U	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Deep	E378-U	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Shallow	E378-U	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Deep	E235.F	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Shallow	E235.F	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Deep	E235.F	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Shallow	E235.F	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO3-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO3-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO3-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO3-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO2-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO2-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO2-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO2-L	01-Jun-2022	----	----	----		02-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Deep	E235.SO4	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Shallow	E235.SO4	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Deep	E235.SO4	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Shallow	E235.SO4	01-Jun-2022	----	----	----		02-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Deep	E375-T	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E375-T	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Deep	E375-T	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E375-T	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) D1-Deep	E366	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) D1-Shallow	E366	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
W1-Deep	E366	01-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
W1-Shallow	E366	01-Jun-2022	07-Jun-2022	----	----		07-Jun-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-Deep	E372-U	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-Shallow	E372-U	01-Jun-2022	15-Jun-2022	----	----		16-Jun-2022	28 days	15 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Deep	E372-U	01-Jun-2022	03-Jun-2022	----	----		05-Jun-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Shallow	E372-U	01-Jun-2022	03-Jun-2022	----	----		05-Jun-2022	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
D1-Deep	E509-L	01-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	12 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
D1-Shallow	E509-L	01-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	12 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
W1-Deep	E509-L	01-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	12 days	✓

Matrix: **Water**

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

Analyte Group / 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 CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
W1-Shallow	E509-L	01-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	12 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Deep	E421	01-Jun-2022	12-Jun-2022	----	----		14-Jun-2022	180 days	13 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Shallow	E421	01-Jun-2022	12-Jun-2022	----	----		14-Jun-2022	180 days	13 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Deep	E421	01-Jun-2022	12-Jun-2022	----	----		14-Jun-2022	180 days	13 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Shallow	E421	01-Jun-2022	12-Jun-2022	----	----		14-Jun-2022	180 days	13 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
D1-Deep	E358-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
D1-Shallow	E358-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
W1-Deep	E358-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
W1-Shallow	E358-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
D1-Deep	E355-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
D1-Shallow	E355-L	01-Jun-2022	15-Jun-2022	----	----		15-Jun-2022	28 days	14 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W1-Deep	E355-L	01-Jun-2022	04-Jun-2022	----	----		04-Jun-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W1-Shallow	E355-L	01-Jun-2022	04-Jun-2022	----	----		04-Jun-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
D1-Deep	E290	01-Jun-2022	----	----	----		06-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
D1-Shallow	E290	01-Jun-2022	----	----	----		06-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W1-Deep	E290	01-Jun-2022	----	----	----		06-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
W1-Shallow	E290	01-Jun-2022	----	----	----		06-Jun-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE										
D1-Deep	E329	01-Jun-2022	----	----	----		03-Jun-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Shallow	E329	01-Jun-2022	----	----	----		03-Jun-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Deep	E329	01-Jun-2022	----	----	----		03-Jun-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Shallow	E329	01-Jun-2022	----	----	----		03-Jun-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Deep	E100	01-Jun-2022	----	----	----		06-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Shallow	E100	01-Jun-2022	----	----	----		06-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Deep	E100	01-Jun-2022	----	----	----		06-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Shallow	E100	01-Jun-2022	----	----	----		06-Jun-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE D1-Deep	E108	01-Jun-2022	----	----	----		06-Jun-2022	0.25 hrs	117 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-Shallow	E108	01-Jun-2022	----	----	----		06-Jun-2022	0.25 hrs	117 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 W1-Shallow	E108	01-Jun-2022	----	----	----		06-Jun-2022	0.25 hrs	119 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Deep	E108	01-Jun-2022	----	----	----		06-Jun-2022	0.25 hrs	120 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-Deep	E162	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-Shallow	E162	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Deep	E162	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Shallow	E162	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Deep	E160	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Shallow	E160	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Deep	E160	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE W1-Shallow	E160	01-Jun-2022	----	----	----		07-Jun-2022	7 days	6 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry										
Opaque HDPE W1-Deep	E870	01-Jun-2022	03-Jun-2022	2 days	2 days	× EHT	03-Jun-2022	672 hrs	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry										
Opaque HDPE W1-Shallow	E870	01-Jun-2022	03-Jun-2022	2 days	2 days	× EHT	03-Jun-2022	672 hrs	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry										
Opaque HDPE D1-Deep	E870	01-Jun-2022	03-Jun-2022	2 days	2 days	✓	03-Jun-2022	672 hrs	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry										
Opaque HDPE D1-Shallow	E870	01-Jun-2022	03-Jun-2022	2 days	2 days	✓	03-Jun-2022	672 hrs	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) D1-Shallow	E537	01-Jun-2022	05-Jul-2022	180 days	34 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) D1-Deep	E537	01-Jun-2022	05-Jul-2022	180 days	35 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) W1-Deep	E537	01-Jun-2022	05-Jul-2022	180 days	35 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) W1-Shallow	E537	01-Jun-2022	05-Jul-2022	180 days	35 days	✓	05-Jul-2022	180 days	0 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
D1-Deep	E536	01-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	29 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
D1-Shallow	E536	01-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	29 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
W1-Deep	E536	01-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	29 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
W1-Shallow	E536	01-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	29 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved)										
D1-Deep	E508-L	01-Jun-2022	----	----	----		07-Jun-2022	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved)										
D1-Shallow	E508-L	01-Jun-2022	----	----	----		07-Jun-2022	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved)										
W1-Deep	E508-L	01-Jun-2022	----	----	----		07-Jun-2022	28 days	6 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved)										
W1-Shallow	E508-L	01-Jun-2022	----	----	----		07-Jun-2022	28 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
D1-Deep	E420	01-Jun-2022	----	----	----		14-Jun-2022	180 days	13 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
D1-Shallow	E420	01-Jun-2022	----	----	----		14-Jun-2022	180 days	13 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
W1-Deep	E420	01-Jun-2022	----	----	----		14-Jun-2022	180 days	13 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
W1-Shallow	E420	01-Jun-2022	----	----	----		14-Jun-2022	180 days	13 days	✓

Legend & Qualifier Definitions

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

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: **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	508896	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	524688	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	508888	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	508897	1	14	7.1	5.0	✓
Conductivity in Water	E100	508895	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	518875	2	19	10.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	524687	1	17	5.8	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	508898	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	508887	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	508889	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	508890	1	20	5.0	5.0	✓
pH by Meter	E108	508894	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	508891	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	513873	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	524689	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	513826	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	518879	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	510721	2	22	9.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	510720	2	22	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	510722	2	22	9.0	5.0	✓
TSS by Gravimetry	E160	513862	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	508896	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	524688	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	508888	1	20	5.0	5.0	✓
Chlorophyll-a by Fluorometry	E870	509716	1	10	10.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	508897	1	14	7.1	5.0	✓
Conductivity in Water	E100	508895	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	518875	1	19	5.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	524687	1	17	5.8	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	508898	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	508887	1	16	6.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrate in Water by IC (Low Level)	E235.NO3-L	508889	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	508890	1	20	5.0	5.0	✓
pH by Meter	E108	508894	1	10	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	508891	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	513873	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	524689	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	513826	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	518879	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	510721	2	22	9.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	510720	2	22	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	510722	2	22	9.0	5.0	✓
TSS by Gravimetry	E160	513862	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	508896	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	524688	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	508888	1	20	5.0	5.0	✓
Chlorophyll-a by Fluorometry	E870	509716	1	10	10.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	508897	1	14	7.1	5.0	✓
Conductivity in Water	E100	508895	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	518875	2	19	10.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	524687	1	17	5.8	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	508898	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	508887	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	508889	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	508890	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	508891	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	513873	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	524689	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	513826	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	518879	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	510721	2	22	9.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	510720	2	22	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	510722	2	22	9.0	5.0	✓
TSS by Gravimetry	E160	513862	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	524688	1	12	8.3	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Chloride in Water by IC	E235.Cl	508888	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	518875	1	19	5.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	524687	1	17	5.8	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	508898	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	508887	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	508889	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	508890	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	508891	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	524689	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	513826	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	518879	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	1	16	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	510721	2	22	9.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	510720	2	22	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	510722	2	22	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	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 Vancouver - Environmental	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 CVAFS (Low Level, LOR = 0.5 ppt)	E508-L Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L Vancouver - Environmental	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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Chlorophyll-a by Fluorometry	E870 Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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 Vancouver - Environmental	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.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Vancouver - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 Vancouver - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration (Low Level)	EP509-L Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Chlorophyll-a Extraction	EP870 Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

QUALITY CONTROL REPORT

Work Order	: **FJ2201394**	Page	: 1 of 18
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 01-Jun-2022 12:57
PO	: 5200-25.01.01	Date Analysis Commenced	: 02-Jun-2022
C-O-C number	: 2022-June-MON8/9	Issue Date	: 08-Jul-2022 17:13
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Dee Lee	Analyst	Vancouver Metals, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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: 508894)											
FJ2201394-003	D1-Deep	pH	----	E108	0.10	pH units	8.10	8.10	0.0494%	4%	----
Physical Tests (QC Lot: 508895)											
FJ2201394-003	D1-Deep	conductivity	----	E100	2.0	µS/cm	189	187	0.959%	10%	----
Physical Tests (QC Lot: 508896)											
FJ2201394-003	D1-Deep	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	83.5	82.5	1.20%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	83.5	82.5	1.20%	20%	----
Physical Tests (QC Lot: 508897)											
FJ2201394-001	W1-Deep	colour, true	----	E329	5.0	CU	7.4	6.4	1.0	Diff <2x LOR	----
Physical Tests (QC Lot: 513862)											
FJ2201394-001	W1-Deep	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 513873)											
FJ2201394-001	W1-Deep	solids, total dissolved [TDS]	----	E162	13	mg/L	108	114	6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 508887)											
KS2201925-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	<12.0	10.4	1.64	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 508888)											
KS2201925-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	38.8	40.0	2.95%	20%	----
Anions and Nutrients (QC Lot: 508889)											
KS2201925-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.179	0.140	0.0389	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 508890)											
KS2201925-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.182	0.174	4.28%	20%	----
Anions and Nutrients (QC Lot: 508891)											
KS2201925-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	43.8	45.0	2.79%	20%	----
Anions and Nutrients (QC Lot: 508898)											
FJ2201394-001	W1-Deep	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 510721)											
FJ2201342-001	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.454	0.450	1.08%	20%	----
Anions and Nutrients (QC Lot: 510722)											
FJ2201342-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0049	0.0053	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524688)											

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*
Anions and Nutrients (QC Lot: 524688) - continued											
FJ2201370-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524689)											
FJ2201394-001	W1-Deep	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0026	0.0030	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524691)											
FJ2201394-003	D1-Deep	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.176	0.184	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 524692)											
FJ2201394-003	D1-Deep	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0478	0.0476	0.398%	20%	----
Organic / Inorganic Carbon (QC Lot: 510720)											
FJ2201342-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.35	3.38	0.03	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 524687)											
FJ2201370-002	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	14.4	15.2	5.52%	20%	----
Organic / Inorganic Carbon (QC Lot: 524690)											
FJ2201394-003	D1-Deep	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	4.11	4.41	0.30	Diff <2x LOR	----
Total Metals (QC Lot: 513826)											
CG2206705-010	Anonymous	mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	0.51	0.006	Diff <2x LOR	----
Total Metals (QC Lot: 518879)											
FJ2201383-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	1560 µg/L	1.79	13.6%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.41 µg/L	0.00042	0.00002	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	1.87 µg/L	0.00208	10.6%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	168 µg/L	0.178	5.16%	20%	----
		beryllium, total	7440-41-7	E420	0.000100	mg/L	0.114 µg/L	0.000120	0.000006	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	14 µg/L	0.014	0.0003	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.144 µg/L	0.000159	9.93%	20%	----
		calcium, total	7440-70-2	E420	0.050	mg/L	35400 µg/L	36.6	3.34%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.543 µg/L	0.000520	4.33%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	2.87 µg/L	0.00351	0.00064	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	1.30 µg/L	0.00139	7.02%	20%	----
		copper, total	7440-50-8	E420	0.00050	mg/L	5.70 µg/L	0.00626	9.50%	20%	----
		iron, total	7439-89-6	E420	0.010	mg/L	2650 µg/L	3.12	16.3%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	2.33 µg/L	0.00252	8.21%	20%	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	4.8 µg/L	0.0050	0.0001	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	8410 µg/L	8.58	2.09%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	56.4 µg/L	0.0574	1.75%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	2.20 µg/L	0.00252	13.7%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 518879) - continued											
FJ2201383-001	Anonymous	nickel, total	7440-02-0	E420	0.00050	mg/L	5.61 µg/L	0.00598	6.52%	20%	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	135 µg/L	0.149	0.013	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	2210 µg/L	2.32	4.68%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	5.17 µg/L	0.00490	5.32%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	2.13 µg/L	0.00188	12.3%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	4470 µg/L	4.79	6.80%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	0.058 µg/L	0.000056	0.000002	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	4460 µg/L	4.46	0.0357%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	132 µg/L	0.131	1.16%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	19500 µg/L	19.9	1.97%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.040 µg/L	0.000048	0.000009	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	0.47 µg/L	0.00052	0.00006	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	19.0 µg/L	0.0226	17.0%	20%	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.889 µg/L	0.000906	1.90%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	7.00 µg/L	0.00829	16.8%	20%	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	15.9 µg/L	0.0181	0.0022	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	0.28 µg/L	0.00024	0.00004	Diff <2x LOR	----
Dissolved Metals (QC Lot: 518875)											
FJ2201431-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0013	<0.0010	0.0003	Diff <2x LOR	----
FJ2201431-001	Anonymous	antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00017	0.00017	0.000004	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0190	0.0204	7.22%	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	0.025	0.026	0.002	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000462	0.0000436	0.0000026	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	178	193	8.03%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000040	0.000047	0.000006	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	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00037	0.00039	0.00002	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 518875) - continued											
FJ2201431-001	Anonymous	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	0.0373	0.0390	4.64%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	129	141	8.58%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00018	0.00016	0.00002	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000790	0.000856	7.95%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00338	0.00361	0.00023	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	4.33	4.79	10.2%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00290	0.00323	10.7%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.0278	0.0274	1.69%	20%	----
		silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.43	1.37	4.29%	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	37.0	39.6	6.80%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.05	1.14	8.82%	20%	----
		sulfur, dissolved	7704-34-9	E421	0.50	mg/L	237	223	6.06%	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	0.000011	0.0000008	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	0.00688	0.00702	2.06%	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	0.0027	0.0029	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: 521460)											
CG2206999-004	Anonymous	mercury, dissolved	7439-97-6	E509-L	20.0	ng/L	<20.0	<20.0	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 538079)											
FC2201130-001	Anonymous	methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	0.000184	0.000212	0.000028	Diff <2x LOR	----
Speciated Metals (QC Lot: 548832)											
FJ2201394-001	W1-Deep	methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	<0.000000020 mg/L	<0.000020	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: 508895)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 508896)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 508897)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 513862)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 513873)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 508887)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 508888)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 508889)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 508890)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 508891)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 508898)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 510721)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 510722)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 524688)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 524689)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 524691)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 524691) - continued						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 524692)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 510720)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 524687)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 524690)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 513826)						
mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Total Metals (QCLot: 518879)						
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	# 0.0092	B
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 518879) - continued						
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	MB-LOR
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 518875)						
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	MBRR
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 518875) - continued						
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 521460)						
mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 538079)						
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 548832)						
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Plant Pigments (QCLot: 509716)						
chlorophyll a	479-61-8	E870	0.01	µg/L	<0.010	----

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*
MB-LOR	*Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.*
MBRR	*Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible*

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 508894)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 508895)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	95.9	90.0	110	----
Physical Tests (QCLot: 508896)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Physical Tests (QCLot: 508897)									
colour, true	----	E329	5	CU	100 CU	107	85.0	115	----
Physical Tests (QCLot: 513862)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.3	85.0	115	----
Physical Tests (QCLot: 513873)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.8	85.0	115	----
Anions and Nutrients (QCLot: 508887)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 508888)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 508889)									
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: 508890)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 508891)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 508898)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 510721)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 510722)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	94.4	80.0	120	----
Anions and Nutrients (QCLot: 524688)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.0	85.0	115	----
Anions and Nutrients (QCLot: 524689)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	92.4	80.0	120	----
Anions and Nutrients (QCLot: 524691)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 524691) - continued									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 524692)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	94.9	80.0	120	----
Organic / Inorganic Carbon (QCLot: 510720)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 524687)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 524690)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.4	80.0	120	----
Total Metals (QCLot: 513826)									
mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	96.0	80.0	120	----
Total Metals (QCLot: 518879)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	95.5	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	97.0	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	99.4	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	92.0	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	97.0	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.3	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	97.5	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	97.6	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.6	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	88.1	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	97.8	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	109	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.8	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	98.9	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	98.0	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 518879) - continued									
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	103	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	109	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.5	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	115	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	102	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.1	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.1	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	91.4	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	98.6	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	94.7	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Dissolved Metals (QCLot: 518875)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	100	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.4	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.0	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	97.9	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	98.8	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.0	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	102	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.2	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.5	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 518875) - continued									
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	114	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	96.8	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	107	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	105	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	99.3	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	94.1	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	99.5	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	90.1	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	100	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	95.8	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	97.0	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.8	80.0	120	----
mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	110	80.0	120	----
Speciated Metals (QCLot: 538079)									
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	84.7	70.0	130	----
Speciated Metals (QCLot: 548832)									
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	71.0	70.0	130	----
Plant Pigments (QCLot: 509716)									
chlorophyll a	479-61-8	E870	0.01	µg/L	5 µg/L	91.6	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: 508887)										
VA22B2095-001	Anonymous	fluoride	16984-48-8	E235.F	11.7 mg/L	10 mg/L	117	75.0	125	----
Anions and Nutrients (QCLot: 508888)										
VA22B2095-001	Anonymous	chloride	16887-00-6	E235.Cl	1010 mg/L	1000 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 508889)										
VA22B2095-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	25.5 mg/L	25 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 508890)										
VA22B2095-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	5.05 mg/L	5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 508891)										
VA22B2095-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1020 mg/L	1000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 508898)										
FJ2201394-002	W1-Shallow	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0299 mg/L	0.03 mg/L	99.8	70.0	130	----
Anions and Nutrients (QCLot: 510721)										
FJ2201342-002	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	2 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 510722)										
FJ2201342-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0494 mg/L	0.05 mg/L	98.8	70.0	130	----
Anions and Nutrients (QCLot: 524688)										
FJ2201370-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 524689)										
FJ2201394-002	W1-Shallow	phosphorus, total dissolved	7723-14-0	E375-T	0.0477 mg/L	0.05 mg/L	95.5	70.0	130	----
Anions and Nutrients (QCLot: 524691)										
FJ2201394-004	D1-Shallow	nitrogen, total	7727-37-9	E366	0.408 mg/L	0.4 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 524692)										
FJ2201394-004	D1-Shallow	phosphorus, total	7723-14-0	E372-U	0.0463 mg/L	0.05 mg/L	92.7	70.0	130	----
Organic / Inorganic Carbon (QCLot: 510720)										
FJ2201342-002	Anonymous	carbon, total organic [TOC]	----	E355-L	5.15 mg/L	5 mg/L	103	70.0	130	----
Organic / Inorganic Carbon (QCLot: 524687)										
FJ2201370-003	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 524690)										

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
Organic / Inorganic Carbon (QCLot: 524690) - continued										
FJ2201394-004	D1-Shallow	carbon, total organic [TOC]	----	E355-L	5.12 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 513826)										
CG2206705-011	Anonymous	mercury, total	7439-97-6	E508-L	4.04 ng/L	5 ng/L	80.8	70.0	130	----
Total Metals (QCLot: 518879)										
FJ2201394-001	W1-Deep	aluminum, total	7429-90-5	E420	0.187 mg/L	0.2 mg/L	93.4	70.0	130	----
		antimony, total	7440-36-0	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		boron, total	7440-42-8	E420	0.095 mg/L	0.1 mg/L	95.2	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		chromium, total	7440-47-3	E420	0.0384 mg/L	0.04 mg/L	96.1	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		copper, total	7440-50-8	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		iron, total	7439-89-6	E420	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, total	7439-92-1	E420	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		lithium, total	7439-93-2	E420	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0188 mg/L	0.02 mg/L	94.1	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	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.2 mg/L	10 mg/L	102	70.0	130	----
		potassium, total	7440-09-7	E420	4.16 mg/L	4 mg/L	104	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		silicon, total	7440-21-3	E420	9.38 mg/L	10 mg/L	93.8	70.0	130	----
		silver, total	7440-22-4	E420	0.00407 mg/L	0.004 mg/L	102	70.0	130	----
		sodium, total	7440-23-5	E420	2.16 mg/L	2 mg/L	108	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	20.3 mg/L	20 mg/L	101	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0426 mg/L	0.04 mg/L	107	70.0	130	----
		thallium, total	7440-28-0	E420	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		thorium, total	7440-29-1	E420	0.0180 mg/L	0.02 mg/L	89.9	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: 518879) - continued										
FJ2201394-001	W1-Deep	tin, total	7440-31-5	E420	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		titanium, total	7440-32-6	E420	0.0379 mg/L	0.04 mg/L	94.8	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		uranium, total	7440-61-1	E420	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0970 mg/L	0.1 mg/L	97.0	70.0	130	----
		zinc, total	7440-66-6	E420	0.370 mg/L	0.4 mg/L	92.5	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0441 mg/L	0.04 mg/L	110	70.0	130	----
Dissolved Metals (QCLot: 518875)										
FJ2201372-002	Anonymous	aluminum, dissolved	7429-90-5	E421	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0195 mg/L	0.02 mg/L	97.3	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0424 mg/L	0.04 mg/L	106	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00926 mg/L	0.01 mg/L	92.6	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.097 mg/L	0.1 mg/L	96.6	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00395 mg/L	0.004 mg/L	98.7	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.00962 mg/L	0.01 mg/L	96.2	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.111 mg/L	0.1 mg/L	111	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0392 mg/L	0.04 mg/L	98.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.3 mg/L	10 mg/L	103	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.21 mg/L	4 mg/L	105	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.70 mg/L	10 mg/L	97.0	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00384 mg/L	0.004 mg/L	96.0	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	0.02 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 518875) - continued										
FJ2201372-002	Anonymous	sulfur, dissolved	7704-34-9	E421	19.9 mg/L	20 mg/L	99.7	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	0.00396 mg/L	0.004 mg/L	99.1	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.386 mg/L	0.4 mg/L	96.6	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
Dissolved Metals (QCLot: 521460)										
CG2206999-006	Anonymous	mercury, dissolved	7439-97-6	E509-L	201 ng/L	200 ng/L	100	70.0	130	----
Speciated Metals (QCLot: 538079)										
FC2201130-002	Anonymous	methylmercury (as MeHg), total	22967-92-6	E536	0.00225 µg/L	0.0025 µg/L	89.9	70.0	130	----
Speciated Metals (QCLot: 548832)										
FJ2201394-002	W1-Shallow	methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00215 µg/L	0.0025 µg/L	86.0	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	*Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

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	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:	600 Comox Rd.	Email 1 or Fax lhull@ecofishresearch.com	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
City/Province:	Courtenay, BC	Email 2 tkasubuchi@ecofishresearch.com	☐ 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:	V9N 3P6	Email 3 waterqualitylabdata@ecofishresearch.com	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	
Company:	Ecofish Research Ltd.	Email 1 or Fax accountspayable@ecofishresearch.com	
Contact:	accountspayable@ecofishresearch.com	Email 2	

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#
Job #:	Surface water MON8/9- with metals	Major/Minor Code:	Routing Code:
PO / AFE:	5200-25.01.01	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC	DOC	Chlorophyll-a	Ammonia	Anions	DO Phos	TKN, TN, Tot Phos., TD Phos	Total Metals + Hardness + Hg	Diss. Metals + Hardness + Hg	Total Methyl Hg	Dissolved Methyl Hg	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~RC1-A~~ W1 - Deep	01-JUN-22	07:40	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RC1-B~~ W1 - Shallow	01-JUN-22	08:50	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD1-A~~ D1 - Deep	01-JUN-22	10:30	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD1-B~~ D1 - Shallow	01-JUN-22	11:00	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR2~~			~~Water~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~RR2-FB~~			~~Water~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~RR3~~			~~Water~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~RD4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR5~~			Water		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~RD5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD6~~			~~Water~~		~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~R~~	~~R~~	~~R~~	~~R~~	R	R	~~R~~	R			

Fort St. John
Work Order Reference
FJ2201394

Drinking Water (DW) Samp — Telephone : +1 250 261 5617 — uation by selecting from drop-down below (COC only)

Are samples taken from a Regulated ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

****Low level Hg for total and dissolved.
Add. contact for report: csuzanne@ecofishresearch.com, kganshorn@ecofishresearch.com

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			
7.6							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: June 6, 22	Time:	Received by: Rick	Date: 6.1.22	Time: 12:45	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

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

ALS www.alsglobal.com

Analytical Request Form

COC Number: 2022-June-MON8/9

1 800 668 9878

Page of

Report To	Contact and company name below will appea	Report Format / Distribution	Turnaround Time (TAT) Requested
Company:	Ecofish Research Ltd.	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	☑ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Leah Hull	Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
Phone:	250-334-3042	☐ 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:	600 Comox Rd.	Email 1 or Fax lhull@ecofishresearch.com	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
City/Province:	Courtenay, BC	Email 2 tkasubuchi@ecofishresearch.com	☐ 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:	V9N 3P6	Email 3 waterqualitylabdata@ecofishresearch.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm
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	
Company:	Ecofish Research Ltd.	Email 1 or Fax accountspayable@ecofishresearch.com	
Contact:	accountspayable@ecofishresearch.com	Email 2	

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- with metals	Major/Minor Code:	Routing Code:
PO / AFE:	5200-25.01.01	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC (P)	DOC (F/P)	Chlorophyll-a	Ammonia (P)	Anions	DO Phos	TKN, TN, Tot Phos., TD Phos (P)	Total Metals + Hardness + Hg (P)	Diss. Metals + Hardness + Hg (F/P)	Total Methyl Hg (P)	Dissolved Methyl Hg (F/P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~RC1-A~~ W1 - Deep	01-JUN-22	07:40	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RC1-B~~ W1 - Shallow	01-JUN-22	08:50	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD1-A~~ D1 - Deep	01-JUN-22	10:30	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD1-B~~ D1 - Shallow	01-JUN-22	11:00	Water	12	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR2~~			~~Water~~		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR2-FB~~			~~Water~~		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR3~~			~~Water~~		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR6~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR7~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RR8~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2201394
Telephone : +1 250 261 5517

Drinking Water (DW) Samp ... uation by selecting from drop-down below ... COC only)

Are samples taken from a Regulated ... ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

****Low level Hg for total and dissolved.
Add. contact for report: csuzanne@ecofishresearch.com, kganshorn@ecofishresearch.com

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			
7.6				8	9	16	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: June 6, 22	Time:	Received by: RICK	Date: 6.7.22	Time: 12:45	Received by: DJ	Date: Jun 7 2022	Time: 8:40

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201421**	Page	: 1 of 11
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 02-Jun-2022 15:31
PO	: 1200.25.03.02	Date Analysis Commenced	: 05-Jun-2022
C-O-C number	: 22-June-Mon8/9	Issue Date	: 12-Aug-2022 16:39
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lilo Wang	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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 Unit
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DTSE	*Dissolved Se concentration exceeds total. Positive bias on D-Se suspected due to signal enhancement from volatile selenium species. Contact ALS if an alternative test to address this interference is needed.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	02-Jun-2022 10:25	02-Jun-2022 10:25	02-Jun-2022 09:15	02-Jun-2022 09:15	02-Jun-2022 12:45
						FJ2201421-001	FJ2201421-002	FJ2201421-003	FJ2201421-004	FJ2201421-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		80.2	79.0	80.9	80.3	83.0
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		80.2	79.0	80.9	80.3	83.0
colour, true	----	E329	5.0	CU		15.1	14.6	15.9	15.8	20.3
conductivity	----	E100	2.0	µS/cm		185	186	187	186	193
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		98.0	95.2	97.4	96.6	94.6
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L		93.2	95.2	95.7	94.8	108
pH	----	E108	0.10	pH units		7.90	7.95	7.99	7.99	8.00
solids, total dissolved [TDS]	----	E162	10	mg/L		132	125	129	125	160
solids, total suspended [TSS]	----	E160	3.0	mg/L		24.3	16.5	17.5	21.3	65.1
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	0.0062
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.046	0.040	0.041	0.040	0.045
Kjeldahl nitrogen, total [TKN]	----	EC318	0.050	mg/L		0.088	0.084	0.088	0.091	0.166
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0837	0.0899	0.0844	0.0873	0.0865
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
nitrogen, total	7727-37-9	E366	0.030	mg/L		0.172	0.174	0.172	0.178	0.252
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0022	0.0020	0.0022	0.0022	0.0033
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0398	0.0466	0.0415	0.0405	0.117
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0036	0.0033	0.0031	0.0035	0.0043
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		14.5	14.5	14.4	14.4	15.5
nitrate + nitrite (as N)	----	EC235.N+N	0.0032	mg/L		0.0837	0.0899	0.0844	0.0873	0.0865
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		3.43	3.58	3.59	3.79	4.76
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		3.73	3.87	3.83	3.74	6.42
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.766	0.833	0.735	0.750	2.73
antimony, total	7440-36-0	E420	0.00010	mg/L		0.00011	0.00011	0.00010	0.00011	0.00023

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	02-Jun-2022 10:25	02-Jun-2022 10:25	02-Jun-2022 09:15	02-Jun-2022 09:15	02-Jun-2022 12:45
						FJ2201421-001	FJ2201421-002	FJ2201421-003	FJ2201421-004	FJ2201421-005
						Result	Result	Result	Result	Result
Total Metals										
arsenic, total	7440-38-2	E420	0.00010	mg/L		0.00075	0.00066	0.00064	0.00064	0.00176
barium, total	7440-39-3	E420	0.00010	mg/L		0.0783	0.0792	0.0803	0.0771	0.117
beryllium, total	7440-41-7	E420	0.000020	mg/L		0.000054	0.000048	0.000057	0.000048	0.000147
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, total	7440-42-8	E420	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, total	7440-43-9	E420	0.0000050	mg/L		0.0000541	0.0000598	0.0000565	0.0000516	0.000169
calcium, total	7440-70-2	E420	0.050	mg/L		27.1	27.8	28.2	28.0	30.5
cesium, total	7440-46-2	E420	0.000010	mg/L		0.000209	0.000216	0.000202	0.000212	0.000569
chromium, total	7440-47-3	E420	0.00050	mg/L		0.00135	0.00139	0.00122	0.00117	0.00478
cobalt, total	7440-48-4	E420	0.00010	mg/L		0.00049	0.00050	0.00048	0.00050	0.00151
copper, total	7440-50-8	E420	0.00050	mg/L		0.00209	0.00212	0.00203	0.00205	0.00497
iron, total	7439-89-6	E420	0.010	mg/L		1.31	1.30	1.30	1.33	3.80
lead, total	7439-92-1	E420	0.000050	mg/L		0.000713	0.000725	0.000711	0.000734	0.00183
lithium, total	7439-93-2	E420	0.0010	mg/L		0.0021	0.0022	0.0022	0.0021	0.0044
magnesium, total	7439-95-4	E420	0.0050	mg/L		6.21	6.26	6.14	6.04	7.77
manganese, total	7439-96-5	E420	0.00010	mg/L		0.0176	0.0174	0.0175	0.0175	0.0541
mercury, total	7439-97-6	E508-L	0.50	ng/L		2.88	3.31	2.95	2.90	4.33
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.000795	0.000784	0.000731	0.000810	0.000982
nickel, total	7440-02-0	E420	0.00050	mg/L		0.00245	0.00243	0.00238	0.00248	0.00632
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	0.113
potassium, total	7440-09-7	E420	0.050	mg/L		0.793	0.819	0.775	0.788	1.57
rubidium, total	7440-17-7	E420	0.00020	mg/L		0.00265	0.00275	0.00242	0.00242	0.00643
selenium, total	7782-49-2	E420	0.000050	mg/L		0.000212	0.000359	0.000272	0.000272	0.000454
silicon, total	7440-21-3	E420	0.10	mg/L		3.01	3.28	2.98	3.00	7.05
silver, total	7440-22-4	E420	0.000010	mg/L		0.000019	0.000020	0.000018	0.000020	0.000044
sodium, total	7440-23-5	E420	0.050	mg/L		1.25	1.23	1.20	1.18	1.36
strontium, total	7440-24-6	E420	0.00020	mg/L		0.111	0.112	0.109	0.109	0.111
sulfur, total	7704-34-9	E420	0.50	mg/L		5.42	5.49	5.21	5.19	5.05
tellurium, total	13494-80-9	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, total	7440-28-0	E420	0.000010	mg/L		0.000026	0.000026	0.000024	0.000025	0.000067
thorium, total	7440-29-1	E420	0.00010	mg/L		0.00016	0.00018	0.00016	0.00019	0.00062

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	02-Jun-2022 10:25	02-Jun-2022 10:25	02-Jun-2022 09:15	02-Jun-2022 09:15	02-Jun-2022 12:45
						FJ2201421-001	FJ2201421-002	FJ2201421-003	FJ2201421-004	FJ2201421-005
						Result	Result	Result	Result	Result
Total Metals										
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, total	7440-32-6	E420	0.00030	mg/L		0.00784	0.0108	0.00617	0.00604	0.0668
tungsten, total	7440-33-7	E420	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, total	7440-61-1	E420	0.000010	mg/L		0.000531	0.000534	0.000515	0.000515	0.000657
vanadium, total	7440-62-2	E420	0.00050	mg/L		0.00303	0.00330	0.00292	0.00297	0.0105
zinc, total	7440-66-6	E420	0.0030	mg/L		0.0069	0.0080	0.0077	0.0070	0.0186
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00060 DLM
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0263	0.0298	0.0232	0.0305	0.0315
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00020	0.00020	0.00019	0.00019	0.00021
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0409	0.0425	0.0440	0.0443	0.0414
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
boron, dissolved	7440-42-8	E421	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.0000124	0.0000129	0.0000119	0.0000114	0.0000143
calcium, dissolved	7440-70-2	E421	0.050	mg/L		28.8	27.7	28.4	28.2	26.7
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00074	0.00075	0.00078	0.00082	0.00094
iron, dissolved	7439-89-6	E421	0.010	mg/L		0.040	0.041	0.032	0.037	0.044
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0015	0.0015	0.0015	0.0015	0.0018
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.34	6.32	6.44	6.37	6.78
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.00320	0.00325	0.00299	0.00284	0.00430
mercury, dissolved	7439-97-6	E509-L	0.50	ng/L		1.13	0.97	1.02	0.94	1.08
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.000706	0.000712	0.000722	0.000719	0.000683
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00118	0.00103	0.00106	0.00109	0.00114
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.480	0.486	0.487	0.487	0.590

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	02-Jun-2022 10:25	02-Jun-2022 10:25	02-Jun-2022 09:15	02-Jun-2022 09:15	02-Jun-2022 12:45
						FJ2201421-001	FJ2201421-002	FJ2201421-003	FJ2201421-004	FJ2201421-005
						Result	Result	Result	Result	Result
Dissolved Metals										
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00025	0.00032	0.00032	0.00035	0.00031
selenium, dissolved	7782-49-2	E421	0.000050	mg/L		0.000335 DTSE	0.000246	0.000220	0.000290	0.000315
silicon, dissolved	7440-21-3	E421	0.050	mg/L		2.25	2.24	2.22	2.27	2.17
silver, dissolved	7440-22-4	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1.21	1.22	1.24	1.21	1.31
strontium, dissolved	7440-24-6	E421	0.00020	mg/L		0.116	0.112	0.112	0.113	0.0955
sulfur, dissolved	7704-34-9	E421	0.50	mg/L		4.97	5.40	5.22	4.63	4.99
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
thallium, dissolved	7440-28-0	E421	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
thorium, dissolved	7440-29-1	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
tin, dissolved	7440-31-5	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
titanium, dissolved	7440-32-6	E421	0.00030	mg/L		0.00072	0.00088	0.00048	0.00072	0.00096
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
uranium, dissolved	7440-61-1	E421	0.000010	mg/L		0.000506	0.000509	0.000502	0.000499	0.000493
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
zinc, dissolved	7440-66-6	E421	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
dissolved MeHg filtration location	----	EP537	-	-		Field	Field	Field	Field	Field
dissolved mercury filtration location	----	EP509-L	-	-		Field	Field	Field	Field	Field
dissolved metals filtration location	----	EP421	-	-		Field	Field	Field	Field	Field
Speciated Metals										
methylmercury (as MeHg), total	22967-92-6	E536	0.000000020	mg/L		0.000000031	0.000000040	0.000000022	0.000000024	0.000000023
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000000020	mg/L		<0.000000020	0.000000022	<0.000000020	<0.000000020	0.000000034

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: HD	HD-FB	----	----	----
					Client sampling date / time: 02-Jun-2022 13:30	02-Jun-2022 13:30	----	----	----
					FJ2201421-006	FJ2201421-007	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	140	<1.0	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	140	<1.0	----	----	----
colour, true	----	E329	5.0	CU	37.7	<5.0	----	----	----
conductivity	----	E100	2.0	µS/cm	319	<2.0	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	172	<0.50	----	----	----
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.50	mg/L	196	<0.50	----	----	----
pH	----	E108	0.10	pH units	8.27	5.57	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	263	<10	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	289	<3.0	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0138	<0.0050	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	0.83	<0.50	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.093	<0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	EC318	0.050	mg/L	0.319	<0.050	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0316	<0.0050	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.351	<0.030	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0066	<0.0010	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.300	<0.0020	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0095	<0.0020	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	32.6	<0.30	----	----	----
nitrate + nitrite (as N)	----	EC235.N+N	0.0032	mg/L	0.0316	<0.0051	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	8.58	0.74 RRV	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	8.71	<0.50	----	----	----
Total Metals									
aluminum, total	7429-90-5	E420	0.0030	mg/L	3.22	<0.0030	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00039	<0.00010	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00303	<0.00010	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	HD	HD-FB	----	----	----
					Client sampling date / time	02-Jun-2022 13:30	02-Jun-2022 13:30	----	----	----
						FJ2201421-006	FJ2201421-007	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
barium, total	7440-39-3	E420	0.00010	mg/L		0.239	<0.00010	----	----	----
beryllium, total	7440-41-7	E420	0.000020	mg/L		0.000242	<0.000020	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L		0.000063	<0.000050	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L		0.016	<0.010	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L		0.000439	<0.0000050	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L		55.6	<0.050	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L		0.000966	<0.000010	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L		0.00575	<0.00050	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L		0.00282	<0.00010	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L		0.00895	<0.00050	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L		6.47	<0.010	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L		0.00398	<0.000050	----	----	----
lithium, total	7439-93-2	E420	0.0010	mg/L		0.0093	<0.0010	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L		13.8	<0.0050	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L		0.101	<0.00010	----	----	----
mercury, total	7439-97-6	E508-L	0.50	ng/L		3.88	<0.50	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.00257	<0.000050	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L		0.0116	<0.00050	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L		0.256	<0.050	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L		1.61	<0.050	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L		0.00806	<0.00020	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L		0.00118	<0.000050	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L		5.84	<0.10	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L		0.000091	<0.000010	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L		2.49	<0.050	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L		0.242	<0.00020	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L		10.5	<0.50	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L		<0.00020	<0.00020	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L		0.000136	<0.000010	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L		0.00096	<0.00010	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L		<0.00010	<0.00010	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	HD	HD-FB	----	----	----
					Client sampling date / time	02-Jun-2022 13:30	02-Jun-2022 13:30	----	----	----
						FJ2201421-006	FJ2201421-007	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
titanium, total	7440-32-6	E420	0.00030	mg/L		0.0253	<0.00030	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L		<0.00010	<0.00010	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L		0.00102	<0.000010	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L		0.0142	<0.00050	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L		0.0386	<0.0030	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L		0.00029	<0.00020	----	----	----
Dissolved Metals										
aluminum, dissolved	7429-90-5	E421	0.0010	mg/L		0.0298	<0.0010	----	----	----
antimony, dissolved	7440-36-0	E421	0.00010	mg/L		0.00018	<0.00010	----	----	----
arsenic, dissolved	7440-38-2	E421	0.00010	mg/L		0.00028	<0.00010	----	----	----
barium, dissolved	7440-39-3	E421	0.00010	mg/L		0.0646	<0.00010	----	----	----
beryllium, dissolved	7440-41-7	E421	0.000020	mg/L		<0.000020	<0.000020	----	----	----
bismuth, dissolved	7440-69-9	E421	0.000050	mg/L		<0.000050	<0.000050	----	----	----
boron, dissolved	7440-42-8	E421	0.010	mg/L		0.010	<0.010	----	----	----
cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L		0.0000226	<0.0000050	----	----	----
calcium, dissolved	7440-70-2	E421	0.050	mg/L		47.6	<0.050	----	----	----
cesium, dissolved	7440-46-2	E421	0.000010	mg/L		<0.000010	<0.000010	----	----	----
chromium, dissolved	7440-47-3	E421	0.00050	mg/L		<0.00050	<0.00050	----	----	----
cobalt, dissolved	7440-48-4	E421	0.00010	mg/L		0.00017	<0.00010	----	----	----
copper, dissolved	7440-50-8	E421	0.00020	mg/L		0.00134	<0.00020	----	----	----
iron, dissolved	7439-89-6	E421	0.010	mg/L		0.064	0.016 RRV	----	----	----
lead, dissolved	7439-92-1	E421	0.000050	mg/L		<0.000050	<0.000050	----	----	----
lithium, dissolved	7439-93-2	E421	0.0010	mg/L		0.0054	<0.0010	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		12.8	<0.0050	----	----	----
manganese, dissolved	7439-96-5	E421	0.00010	mg/L		0.00692	0.00017 RRV	----	----	----
mercury, dissolved	7439-97-6	E509-L	0.50	ng/L		1.44	<0.50	----	----	----
molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L		0.00251	<0.000050	----	----	----
nickel, dissolved	7440-02-0	E421	0.00050	mg/L		0.00234	<0.00050	----	----	----
phosphorus, dissolved	7723-14-0	E421	0.050	mg/L		<0.050	<0.050	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.724	<0.050	----	----	----
rubidium, dissolved	7440-17-7	E421	0.00020	mg/L		0.00037	<0.00020	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: HD	HD-FB	----	----	----
					Client sampling date / time: 02-Jun-2022 13:30	02-Jun-2022 13:30	----	----	----
					FJ2201421-006	FJ2201421-007	--------	--------	--------
					Result	Result	----	----	----
Dissolved Metals									
selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00114	<0.000050	----	----	----
silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.91	<0.050	----	----	----
silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.59	<0.050	----	----	----
strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.220	<0.00020	----	----	----
sulfur, dissolved	7704-34-9	E421	0.50	mg/L	12.2	<0.50	----	----	----
tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----
thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----
thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00118	<0.00030	----	----	----
tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----
uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000666	<0.000010	----	----	----
vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----
zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----
zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	----	----	----
dissolved MeHg filtration location	----	EP537	-	-	Field	Field	----	----	----
dissolved mercury filtration location	----	EP509-L	-	-	Field	Field	----	----	----
dissolved metals filtration location	----	EP421	-	-	Field	Field	----	----	----
Speciated Metals									
methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	----	<0.000020	----	----	----
methylmercury (as MeHg), total	22967-92-6	E536	0.000000020	mg/L	0.000000035	----	----	----	----
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000000020	mg/L	0.000000034	<0.000000020	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201421**	Page	: 1 of 29
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 02-Jun-2022 15:31
PO	: 1200.25.03.02	Issue Date	: 12-Aug-2022 16:39
C-O-C number	: 22-June-Mon8/9		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
HD	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
HD-FB	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PC1-A	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PC1-B	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PR1-A	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PR1-B	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PR2	E298	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE HD	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD-FB	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PC1-A	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PC1-B	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR1-A	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR1-B	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2	E235.Cl	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD-FB	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1-A	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1-B	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1-A	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1-B	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2	E378-U	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD-FB	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1-A	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1-B	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1-A	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1-B	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2	E235.F	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD-FB	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1-A	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1-B	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1-A	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR1-B	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2	E235.NO3-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD-FB	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1-A	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1-B	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1-A	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1-B	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2	E235.NO2-L	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD-FB	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1-A	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1-B	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1-A	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1-B	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2	E235.SO4	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD-FB	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1-A	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1-B	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1-A	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1-B	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2	E375-T	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) HD	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) HD-FB	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PC1-A	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PC1-B	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR1-A	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR1-B	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR2	E366	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD-FB	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1-A	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1-B	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1-A	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1-B	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2	E372-U	02-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) HD	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) HD-FB	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PC1-A	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PC1-B	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR1-A	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR1-B	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR2	E509-L	02-Jun-2022	13-Jun-2022	----	----		13-Jun-2022	28 days	11 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
HD-FB	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PC1-A	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PC1-B	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PR1-A	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PR1-B	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PR2	E421	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
HD	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
HD-FB	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PC1-A	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PC1-B	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1-A	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1-B	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2	E358-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD-FB	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1-A	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1-B	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1-A	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1-B	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2	E355-L	02-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD-FB	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1-A	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1-B	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1-A	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1-B	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2	E290	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE HD	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD-FB	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1-A	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1-B	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR1-A	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR1-B	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR2	E329	02-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE HD	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE HD-FB	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PC1-A	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PC1-B	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1-A	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1-B	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PR2	E100	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	6 days	✓
Physical Tests : pH by Meter										
HDPE HD	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	146 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE HD-FB	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	146 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	146 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PC1-A	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	149 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PC1-B	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	149 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1-A	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	150 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1-B	E108	02-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	150 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE HD-FB	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PC1-A	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PC1-B	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR1-A	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR1-B	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 PR2	E162	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD-FB	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PC1-A	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PC1-B	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1-A	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1-B	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2	E160	02-Jun-2022	----	----	----		06-Jun-2022	7 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) HD	E537	02-Jun-2022	07-Jul-2022	180 days	35 days	✓	07-Jul-2022	180 days	0 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
HD-FB	E537	02-Jun-2022	07-Jul-2022	180 days	35 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PR2	E537	02-Jun-2022	07-Jul-2022	180 days	35 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PC1-A	E537	02-Jun-2022	07-Jul-2022	180 days	36 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PC1-B	E537	02-Jun-2022	07-Jul-2022	180 days	36 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PR1-A	E537	02-Jun-2022	07-Jul-2022	180 days	36 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PR1-B	E537	02-Jun-2022	07-Jul-2022	180 days	36 days	✓	07-Jul-2022	180 days	0 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
HD	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	27 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
PR2	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	27 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
PC1-A	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	28 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PC1-B	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	28 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR1-A	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	28 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR1-B	E536	02-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	180 days	28 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) HD-FB	E536	02-Jun-2022	04-Jul-2022	----	----		04-Jul-2022	180 days	32 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) HD	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) HD-FB	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PC1-A	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PC1-B	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR1-A	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR1-B	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR2	E508-L	02-Jun-2022	11-Jun-2022	----	----		11-Jun-2022	28 days	9 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) HD-FB	E420	02-Jun-2022	10-Jun-2022	----	----		12-Jun-2022	180 days	10 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) HD	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PC1-A	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PC1-B	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR1-A	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR1-B	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR2	E420	02-Jun-2022	10-Jun-2022	----	----		10-Jun-2022	180 days	8 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	511730	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511732	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511737	1	7	14.2	5.0	✓
Conductivity in Water	E100	511729	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	517120	2	36	5.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	550567	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511736	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	511731	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511733	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511734	1	16	6.2	5.0	✓
pH by Meter	E108	511728	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511735	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	519968	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	517110	2	40	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	2	32	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	511730	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511732	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511737	1	7	14.2	5.0	✓
Conductivity in Water	E100	511729	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	517120	2	36	5.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	550567	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511736	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	511731	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511733	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	511734	1	16	6.2	5.0	✓
pH by Meter	E108	511728	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511735	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	519968	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	517110	2	40	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	2	32	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	511730	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511732	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511737	1	7	14.2	5.0	✓
Conductivity in Water	E100	511729	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	517120	2	36	5.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	550567	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511736	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	511731	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511733	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511734	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511735	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	519968	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	517110	2	40	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	2	32	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511732	1	19	5.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	521460	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Dissolved Metals in Water by CRC ICPMS	E421	517120	2	36	5.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	550567	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511736	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	511731	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511733	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511734	1	16	6.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511735	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	519968	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	517110	2	40	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	538079	2	32	6.2	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 Vancouver - Environmental	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 Vancouver - Environmental	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 CVAFS (Low Level, LOR = 0.5 ppt)	E508-L Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L Vancouver - Environmental	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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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 Vancouver - Environmental	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.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Vancouver - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 Vancouver - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration (Low Level)	EP509-L Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".

QUALITY CONTROL REPORT

Work Order	: **FJ2201421**	Page	: 1 of 27
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 02-Jun-2022 15:31
PO	: 1200.25.03.02	Date Analysis Commenced	: 05-Jun-2022
C-O-C number	: 22-June-Mon8/9	Issue Date	: 12-Aug-2022 16:39
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Benjamin Oke	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lilo Wang	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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: 511728)											
FJ2201421-001	PC1-A	pH	----	E108	0.10	pH units	7.90	7.97	0.882%	4%	----
Physical Tests (QC Lot: 511729)											
FJ2201421-001	PC1-A	conductivity	----	E100	2.0	µS/cm	185	186	0.755%	10%	----
Physical Tests (QC Lot: 511730)											
FJ2201421-001	PC1-A	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	80.2	80.2	0.00%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	80.2	80.2	0.00%	20%	----
Physical Tests (QC Lot: 511737)											
FJ2201421-001	PC1-A	colour, true	----	E329	5.0	CU	15.1	12.8	2.3	Diff <2x LOR	----
Physical Tests (QC Lot: 513244)											
FJ2201370-002	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	15.7	17.1	1.4	Diff <2x LOR	----
Physical Tests (QC Lot: 513245)											
FJ2201370-002	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	2040	2340	13.7%	20%	----
Anions and Nutrients (QC Lot: 511731)											
FJ2201421-001	PC1-A	fluoride	16984-48-8	E235.F	0.020	mg/L	0.046	0.040	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511732)											
FJ2201421-001	PC1-A	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511733)											
FJ2201421-001	PC1-A	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0837	0.0826	1.31%	20%	----
Anions and Nutrients (QC Lot: 511734)											
FJ2201421-001	PC1-A	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511735)											
FJ2201421-001	PC1-A	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.5	14.5	0.175%	20%	----
Anions and Nutrients (QC Lot: 511736)											
FJ2201421-001	PC1-A	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0022	0.0017	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517456)											
FJ2201421-001	PC1-A	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.172	0.170	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517457)											
FJ2201421-001	PC1-A	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0398	0.0426	6.82%	20%	----
Anions and Nutrients (QC Lot: 517458)											

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*
Anions and Nutrients (QC Lot: 517458) - continued											
FJ2201421-001	PC1-A	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0036	0.0029	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517459)											
FJ2201421-001	PC1-A	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 517454)											
FJ2201421-001	PC1-A	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.43	3.59	0.16	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 517455)											
FJ2201421-001	PC1-A	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.73	3.72	0.01	Diff <2x LOR	----
Total Metals (QC Lot: 517110)											
CG2207071-005	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.956	0.879	8.46%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00014	0.00014	0.000004	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00078	0.00068	0.00009	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0693	0.0632	9.20%	20%	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	0.063 µg/L	0.000083	0.000020	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.167 µg/L	0.000152	9.03%	20%	----
		calcium, total	7440-70-2	E420	0.050	mg/L	31.9	32.9	3.10%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000212	0.000214	0.784%	20%	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	0.00140	0.00131	0.00009	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.76 µg/L	0.00070	0.00006	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00232	0.00213	0.00019	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.010	mg/L	1.32	1.21	8.31%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000884	0.000890	0.613%	20%	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0043	0.0043	0.00003	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	9.82	9.00	8.75%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0361	0.0341	5.77%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000595	0.000598	0.548%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00338	0.00315	0.00024	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.077	0.083	0.006	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	0.796	0.734	8.05%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00249	0.00222	11.2%	20%	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	2.30 µg/L	0.00221	3.97%	20%	----
		silicon, total	7440-21-3	E420	0.10	mg/L	2.77	2.71	2.02%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	0.000027	0.000026	0.0000005	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	1.48	1.37	7.44%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 517110) - continued											
CG2207071-005	Anonymous	strontium, total	7440-24-6	E420	0.00020	mg/L	0.0794	0.0840	5.72%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	9.84	8.96	9.44%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	0.000049	0.000048	0.0000003	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	0.00013	0.00014	0.00001	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00759	0.00690	9.51%	20%	----
		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	0.000484	0.000484	0.0248%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00378	0.00363	0.00015	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0107	0.0100	0.0007	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 517116)											
FJ2201421-007	HD-FB	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	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<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	<0.010	<0.010	0	Diff <2x LOR	----
		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	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	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	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	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: 517116) - continued											
FJ2201421-007	HD-FB	rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		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	<0.10	<0.10	0	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	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	<0.00030	0	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	<0.000010	<0.000010	0	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	<0.0030	<0.0030	0	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 519968)											
CG2206999-004	Anonymous	mercury, total	7439-97-6	E508-L	0.50	ng/L	0.54	0.57	0.02	Diff <2x LOR	----
Dissolved Metals (QC Lot: 517120)											
YL2200579-001	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0100	mg/L	<0.0100	0.0140	0.0040	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00100	mg/L	0.830	0.817	1.53%	20%	----
		arsenic, dissolved	7440-38-2	E421	0.00100	mg/L	18.9	18.9	0.0463%	20%	----
		barium, dissolved	7440-39-3	E421	0.00100	mg/L	0.0303	0.0305	0.700%	20%	----
		beryllium, dissolved	7440-41-7	E421	0.000200	mg/L	<0.000200	<0.000200	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.100	mg/L	0.269	0.266	0.004	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000500	mg/L	0.000236	0.000262	0.0000253	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.500	mg/L	288	290	0.724%	20%	----
		cesium, dissolved	7440-46-2	E421	0.000100	mg/L	0.000364	0.000382	0.000018	Diff <2x LOR	----
		chromium, dissolved	7440-47-3	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00100	mg/L	0.0321	0.0325	1.25%	20%	----
		copper, dissolved	7440-50-8	E421	0.00200	mg/L	0.00709	0.00716	0.00007	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000500	mg/L	0.00258	0.00265	0.000068	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 517120) - continued											
YL2200579-001	Anonymous	lithium, dissolved	7439-93-2	E421	0.0100	mg/L	0.0277	0.0275	0.0002	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0500	mg/L	75.5	75.8	0.349%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00100	mg/L	0.400	0.405	1.35%	20%	----
		molybdenum, dissolved	7439-98-7	E421	0.000500	mg/L	0.0158	0.0160	1.17%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00500	mg/L	0.0413	0.0418	0.00050	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	8.80	8.82	0.163%	20%	----
		rubidium, dissolved	7440-17-7	E421	0.00200	mg/L	0.00728	0.00860	0.00132	Diff <2x LOR	----
		selenium, dissolved	7782-49-2	E421	0.000500	mg/L	<0.000500	<0.000500	0	Diff <2x LOR	----
		silicon, dissolved	7440-21-3	E421	0.500	mg/L	4.56	4.67	0.110	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	131	128	2.08%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00200	mg/L	3.34	3.38	1.05%	20%	----
		sulfur, dissolved	7704-34-9	E421	5.00	mg/L	236	246	4.15%	20%	----
		tellurium, dissolved	13494-80-9	E421	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		thallium, dissolved	7440-28-0	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		thorium, dissolved	7440-29-1	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		titanium, dissolved	7440-32-6	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
		tungsten, dissolved	7440-33-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000100	mg/L	0.00512	0.00503	1.83%	20%	----
		vanadium, dissolved	7440-62-2	E421	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0100	mg/L	0.0617	0.0620	0.0003	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00300	mg/L	<0.00300	<0.00300	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 517139)											
FJ2201421-007	HD-FB	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 517139) - continued											
FJ2201421-007	HD-FB	chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		iron, dissolved	7439-89-6	E421	0.010	mg/L	0.016	0.016	0.0006	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00017	0.00020	0.00003	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		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	<0.050	<0.050	0	Diff <2x LOR	----
		silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		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	<0.000010	<0.000010	0	Diff <2x LOR	----
		vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 521460)											
CG2206999-004	Anonymous	mercury, dissolved	7439-97-6	E509-L	20.0	ng/L	<20.0	<20.0	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 538079)											
FC2201130-001	Anonymous	methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	0.000184	0.000212	0.000028	Diff <2x LOR	----
Speciated Metals (QC Lot: 544123)											
FJ2201421-007	HD-FB	methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/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*
Speciated Metals (QC Lot: 550567)											
FJ2201421-001	PC1-A	methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	<0.000000020 mg/L	0.000029	0.000009	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: 511729)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 511730)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 511737)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 513244)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 513245)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 511731)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 511732)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 511733)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 511734)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 511735)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 511736)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 517456)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 517457)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 517458)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 517459)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 517454)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 517454) - continued						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 517455)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 517110)						
aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 517110) - continued						
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: 517116)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 517116) - continued						
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 519968)						
mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 517120)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 517120) - continued						
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 517139)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 517139) - continued						
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 521460)						
mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 538079)						
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 544123)						
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 550567)						
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 511728)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 511729)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.4	90.0	110	----
Physical Tests (QCLot: 511730)									
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.6	85.0	115	----
Physical Tests (QCLot: 511737)									
colour, true	----	E329	5	CU	100 CU	106	85.0	115	----
Physical Tests (QCLot: 513244)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	103	85.0	115	----
Physical Tests (QCLot: 513245)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	107	85.0	115	----
Anions and Nutrients (QCLot: 511731)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 511732)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 511733)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 511734)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 511735)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 511736)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.6	80.0	120	----
Anions and Nutrients (QCLot: 517456)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 517457)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.7	80.0	120	----
Anions and Nutrients (QCLot: 517458)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.3	80.0	120	----
Anions and Nutrients (QCLot: 517459)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.9	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 517454)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 517455)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Total Metals (QCLot: 517110)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	105	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	115	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	97.4	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	111	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	99.0	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	107	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	98.1	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	96.3	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	98.4	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	113	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	109	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	95.4	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	96.3	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.5	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	97.9	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	98.8	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	94.3	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	95.3	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	97.3	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	105	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
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	108	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	111	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	96.0	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 517110) - continued									
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	95.5	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	102	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	99.2	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: 517116)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	112	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	113	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	112	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	112	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	111	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	109	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	108	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	114	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	112	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	119	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	96.8	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	114	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	107	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	110	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	115	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	110	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	116	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	104	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	99.4	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	117	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	89.4	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 517116) - continued									
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	105	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	93.5	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	104	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	101	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	114	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
Total Metals (QCLot: 519968)									
mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	112	80.0	120	----
Dissolved Metals (QCLot: 517120)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	103	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	107	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	103	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	107	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	110	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.4	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	110	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	108	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	108	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	106	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	105	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	95.8	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	109	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 517120) - continued									
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.3	80.0	120	----
silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.7	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	108	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	109	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	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	100	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	97.4	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	112	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	106	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 517139)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.9	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	97.0	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	91.3	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.2	80.0	120	----
cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	100	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	105	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	108	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.6	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	100	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 517139) - continued									
phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.4	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.7	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	99.1	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	99.3	80.0	120	----
sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	100	80.0	120	----
tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	104	80.0	120	----
thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	99.8	80.0	120	----
titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	98.5	80.0	120	----
tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.7	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	107	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	104	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	98.7	80.0	120	----
mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	110	80.0	120	----
Speciated Metals (QCLot: 538079)									
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	84.7	70.0	130	----
Speciated Metals (QCLot: 544123)									
methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	94.4	70.0	130	----
Speciated Metals (QCLot: 550567)									
methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	76.6	70.0	130	----

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: 511731)										
FJ2201421-002	PC1-B	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 511732)										
FJ2201421-002	PC1-B	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 511733)										
FJ2201421-002	PC1-B	nitrate (as N)	14797-55-8	E235.NO3-L	2.57 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 511734)										
FJ2201421-002	PC1-B	nitrite (as N)	14797-65-0	E235.NO2-L	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 511735)										
FJ2201421-002	PC1-B	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 511736)										
FJ2201421-002	PC1-B	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0298 mg/L	0.03 mg/L	99.4	70.0	130	----
Anions and Nutrients (QCLot: 517456)										
FJ2201421-002	PC1-B	nitrogen, total	7727-37-9	E366	0.399 mg/L	0.4 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 517457)										
FJ2201421-002	PC1-B	phosphorus, total	7723-14-0	E372-U	0.0478 mg/L	0.05 mg/L	95.6	70.0	130	----
Anions and Nutrients (QCLot: 517458)										
FJ2201421-002	PC1-B	phosphorus, total dissolved	7723-14-0	E375-T	0.0497 mg/L	0.05 mg/L	99.4	70.0	130	----
Anions and Nutrients (QCLot: 517459)										
FJ2201421-002	PC1-B	ammonia, total (as N)	7664-41-7	E298	0.110 mg/L	0.1 mg/L	110	75.0	125	----
Organic / Inorganic Carbon (QCLot: 517454)										
FJ2201421-002	PC1-B	carbon, dissolved organic [DOC]	----	E358-L	4.92 mg/L	5 mg/L	98.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 517455)										
FJ2201421-002	PC1-B	carbon, total organic [TOC]	----	E355-L	5.08 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 517110)										
CG2207071-006	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0381 mg/L	0.04 mg/L	95.3	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: 517110) - continued										
CG2207071-006	Anonymous	bismuth, total	7440-69-9	E420	0.00949 mg/L	0.01 mg/L	94.9	70.0	130	----
		boron, total	7440-42-8	E420	0.093 mg/L	0.1 mg/L	92.6	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00959 mg/L	0.01 mg/L	95.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		iron, total	7439-89-6	E420	2.02 mg/L	2 mg/L	101	70.0	130	----
		lead, total	7439-92-1	E420	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		lithium, total	7439-93-2	E420	0.0886 mg/L	0.1 mg/L	88.6	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		nickel, total	7440-02-0	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.93 mg/L	10 mg/L	99.3	70.0	130	----
		potassium, total	7440-09-7	E420	4.18 mg/L	4 mg/L	104	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		selenium, total	7782-49-2	E420	0.0395 mg/L	0.04 mg/L	98.7	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	0.00386 mg/L	0.004 mg/L	96.5	70.0	130	----
		sodium, total	7440-23-5	E420	2.13 mg/L	2 mg/L	107	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	20.9 mg/L	20 mg/L	105	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0366 mg/L	0.04 mg/L	91.4	70.0	130	----
		thallium, total	7440-28-0	E420	0.00366 mg/L	0.004 mg/L	91.6	70.0	130	----
		thorium, total	7440-29-1	E420	0.0198 mg/L	0.02 mg/L	99.3	70.0	130	----
		tin, total	7440-31-5	E420	0.0185 mg/L	0.02 mg/L	92.7	70.0	130	----
		titanium, total	7440-32-6	E420	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0188 mg/L	0.02 mg/L	94.2	70.0	130	----
		uranium, total	7440-61-1	E420	0.00361 mg/L	0.004 mg/L	90.2	70.0	130	----
		vanadium, total	7440-62-2	E420	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, total	7440-66-6	E420	0.423 mg/L	0.4 mg/L	106	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0389 mg/L	0.04 mg/L	97.4	70.0	130	----
Total Metals (QCLot: 517116)										
FJ2201448-008	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 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: 517116) - continued										
FJ2201448-008	Anonymous	antimony, total	7440-36-0	E420	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0428 mg/L	0.04 mg/L	107	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		boron, total	7440-42-8	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00433 mg/L	0.004 mg/L	108	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0110 mg/L	0.01 mg/L	110	70.0	130	----
		chromium, total	7440-47-3	E420	0.0433 mg/L	0.04 mg/L	108	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0213 mg/L	0.02 mg/L	107	70.0	130	----
		copper, total	7440-50-8	E420	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		iron, total	7439-89-6	E420	2.13 mg/L	2 mg/L	106	70.0	130	----
		lead, total	7439-92-1	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		lithium, total	7439-93-2	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	0.0221 mg/L	0.02 mg/L	110	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0213 mg/L	0.02 mg/L	106	70.0	130	----
		nickel, total	7440-02-0	E420	0.0430 mg/L	0.04 mg/L	107	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.93 mg/L	10 mg/L	99.3	70.0	130	----
		potassium, total	7440-09-7	E420	4.13 mg/L	4 mg/L	103	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0217 mg/L	0.02 mg/L	108	70.0	130	----
		selenium, total	7782-49-2	E420	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		silicon, total	7440-21-3	E420	9.84 mg/L	10 mg/L	98.4	70.0	130	----
		silver, total	7440-22-4	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		sodium, total	7440-23-5	E420	2.15 mg/L	2 mg/L	107	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	21.0 mg/L	20 mg/L	105	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
		thallium, total	7440-28-0	E420	0.00387 mg/L	0.004 mg/L	96.8	70.0	130	----
		thorium, total	7440-29-1	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		tin, total	7440-31-5	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		titanium, total	7440-32-6	E420	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		uranium, total	7440-61-1	E420	0.00408 mg/L	0.004 mg/L	102	70.0	130	----
		vanadium, total	7440-62-2	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		zinc, total	7440-66-6	E420	0.434 mg/L	0.4 mg/L	108	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: 517116) - continued										
FJ2201448-008	Anonymous	zirconium, total	7440-67-7	E420	0.0420 mg/L	0.04 mg/L	105	70.0	130	----
Total Metals (QCLot: 519968)										
CG2206999-005	Anonymous	mercury, total	7439-97-6	E508-L	3.98 ng/L	5 ng/L	79.6	70.0	130	----
Dissolved Metals (QCLot: 517120)										
YL2200579-003	Anonymous	aluminum, dissolved	7429-90-5	E421	0.212 mg/L	0.2 mg/L	106	70.0	130	----
		antimony, dissolved	7440-36-0	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		barium, dissolved	7440-39-3	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0417 mg/L	0.04 mg/L	104	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00934 mg/L	0.01 mg/L	93.4	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0178 mg/L	0.02 mg/L	89.3	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.86 mg/L	2 mg/L	93.1	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0356 mg/L	0.04 mg/L	89.1	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	10.7 mg/L	10 mg/L	107	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0466 mg/L	0.04 mg/L	116	70.0	130	----
		silicon, dissolved	7440-21-3	E421	10.1 mg/L	10 mg/L	101	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00372 mg/L	0.004 mg/L	93.0	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0444 mg/L	0.04 mg/L	111	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00376 mg/L	0.004 mg/L	94.1	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0217 mg/L	0.02 mg/L	108	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: 517120) - continued										
YL2200579-003	Anonymous	tin, dissolved	7440-31-5	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00432 mg/L	0.004 mg/L	108	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.391 mg/L	0.4 mg/L	97.8	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 517139)										
FJ2201448-016	Anonymous	aluminum, dissolved	7429-90-5	E421	0.206 mg/L	0.2 mg/L	103	70.0	130	----
		antimony, dissolved	7440-36-0	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, dissolved	7440-41-7	E421	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00885 mg/L	0.01 mg/L	88.5	70.0	130	----
		boron, dissolved	7440-42-8	E421	0.086 mg/L	0.1 mg/L	86.0	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00410 mg/L	0.004 mg/L	102	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		iron, dissolved	7439-89-6	E421	1.84 mg/L	2 mg/L	92.3	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		lithium, dissolved	7439-93-2	E421	0.0998 mg/L	0.1 mg/L	99.8	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, dissolved	7439-96-5	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		nickel, dissolved	7440-02-0	E421	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		phosphorus, dissolved	7723-14-0	E421	11.1 mg/L	10 mg/L	111	70.0	130	----
		potassium, dissolved	7440-09-7	E421	4.23 mg/L	4 mg/L	106	70.0	130	----
		rubidium, dissolved	7440-17-7	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0414 mg/L	0.04 mg/L	103	70.0	130	----
		silicon, dissolved	7440-21-3	E421	9.44 mg/L	10 mg/L	94.4	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00416 mg/L	0.004 mg/L	104	70.0	130	----
		sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----

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: 517139) - continued										
FJ2201448-016	Anonymous	sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, dissolved	13494-80-9	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		thallium, dissolved	7440-28-0	E421	0.00402 mg/L	0.004 mg/L	101	70.0	130	----
		thorium, dissolved	7440-29-1	E421	0.0219 mg/L	0.02 mg/L	110	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		titanium, dissolved	7440-32-6	E421	0.0396 mg/L	0.04 mg/L	98.9	70.0	130	----
		tungsten, dissolved	7440-33-7	E421	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		uranium, dissolved	7440-61-1	E421	0.00413 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, dissolved	7440-62-2	E421	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.412 mg/L	0.4 mg/L	103	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 521460)										
CG2206999-006	Anonymous	mercury, dissolved	7439-97-6	E509-L	201 ng/L	200 ng/L	100	70.0	130	----
Speciated Metals (QCLot: 538079)										
FC2201130-002	Anonymous	methylmercury (as MeHg), total	22967-92-6	E536	0.00225 µg/L	0.0025 µg/L	89.9	70.0	130	----
Speciated Metals (QCLot: 544123)										
KS2201958-001	Anonymous	methylmercury (as MeHg), total	22967-92-6	E536	0.00228 µg/L	0.0025 µg/L	91.2	70.0	130	----
Speciated Metals (QCLot: 550567)										
FJ2201421-002	PC1-B	methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00202 µg/L	0.0025 µg/L	80.9	70.0	130	----

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Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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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 lhull@ecofishresearch.com
Email 2 tkasubuchi@ecofishresearch.com
Email 3 waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

Project Information

ALS Account # / Quote #: VA22-ECOF100-004
Job #: Surface water MON8/9- with metals
PO / AFE: 1200-25.03.02
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare — Sampler: Pat Beaupre

Fort St. John
Work Order Reference
FJ2201421
Telephone : +1 250 261 5517

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC (P)	DOC (F/P)	Chlorophyll-a	Ammonia (P)	Anions	DO Phos	TKN, TN, Tot Phos., TD Phos (P)	Total Metals + Hardness + Hg (P)	Diss. Metals + Hardness + Hg (F/P)	Total Methyl Hg (P)	Dissolved Methyl Hg (F/P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PC1-A	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PC1-B	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-A	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-B	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR2	02-06-22	12:45	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-FB~~ HD	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-B4~~ HD-FB	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~FB1~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD2~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~RD5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
				Water		R	R	R	R	R		R	R	R	R	R	R	R	R			

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

Are samples taken from a Regulated DW System?
☐ YES ☑ NO
Are samples for human consumption/ use?
☐ YES ☑ NO

result evaluation by selecting from drop-down below (Excel COC only)

olved.
@ecofishresearch.com, kganshorn@ecofishresearch.com

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: 10°
FINAL COOLER TEMPERATURES °C:

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by: S	Date: June 2/22	Time: 15:15	Received by:	Date:	Time:

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

AUG 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.

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

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page 1 of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com
Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests
Date and Time Required for all E&P TATs: dd-mmm-yy hh mm am/pm
For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC (P)	DOC (F/P)	Chlorophyll-a	Ammonia (P)	Anions	DO Phos	TKN, TN, Tot Phos., TD Phos (P)	Total Metals + Hardness + Hg (P)	Diss. Metals + Hardness + Hg (F/P)	Total Methyl Hg (P)	Dissolved Methyl Hg (F/P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	PC1-A	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PC1-B	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-A	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-B	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR2	02-06-22	12:45	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-FB~~ HD	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-04~~ HD-FB	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client u... 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

...lved. ...@ecofishresearch.com, kganshorn@ecofishresearch.com

Telephone : 1 250 261 5511

Fort St. John Work Order Reference FJ2201421

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	
10.2		9	

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)		
Received by:	Date: 3-Jun-22	Time: 15:15

FINAL SHIPMENT RECEPTION (ALS use only)		
Received by: RJ	Date: JUN 3	Time: 21:00

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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
3 # of Coolers Air
# of Carboys Ground

ALS www.alsg

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 2022-June-MON8/9

Page 1 of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- with metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC (P)	DOC (F/P)	Chlorophyll-a	Ammonia (P)	Anions	DO Phos	TKN, TN, Tot Phos, TD Phos (P)	Total Metals + Hardness + Hg (P)	Diss. Metals + Hardness + Hg (F/P)	Total Methyl Hg (P)	Dissolved Methyl Hg (F/P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PC1-A	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PC1-B	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-A	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR1-B	02-06-22	9:15	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	PR2	02-06-22	12:45	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-FD~~ HD	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-04~~ HD-FB	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD1~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD2~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client u... 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

...lved. @ecofishresearch.com, kganshorn@ecofishresearch.com

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		
10.2			9		

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Received by:	Date: JUN 2/22	Time: 15:15	Received by: RJ	Date: JUN 3	Time: 21:00

FJ2201421
Work Order Reference
Fort St. John
Telephone: +1 250 261 5513

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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
3 # of Coolers ✓ Air
___ # of Carboys ___ Ground

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# of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 2022-June-MON8/9

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
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Analysis Request

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	PC1-A	02-06-22	10:25	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
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	~~PR2-FB~~ HD	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PR2-04~~ HD-FB	02-06-22	13:30	Water	11	R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD1~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD2~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD3~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD4~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			
	~~PD5~~			Water		R	R	R	R	R		R	R	R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client u ... 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

...olved. ...@ecofishresearch.com, kganshorn@ecofishresearch.com

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			
10.2				9			

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)		
Received by:	Date: JUN 2/22	Time: 1515

FINAL SHIPMENT RECEPTION (ALS use only)		
Received by: RJ	Date: JUN 3	Time: 210

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

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

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201438**	Page	: 1 of 12
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 03-Jun-2022 16:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 05-Jun-2022
C-O-C number	: 2022-June-MON8/9	Issue Date	: 06-Jun-2023 14:36
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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*
-	no units
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	PD1	MD	PINE	BEA	PD2
					Client sampling date / time	03-Jun-2022 11:45	03-Jun-2022 16:00	03-Jun-2022 11:15	03-Jun-2022 09:35	03-Jun-2022 10:10
						FJ2201438-001	FJ2201438-002	FJ2201438-003	FJ2201438-004	FJ2201438-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L		100	105	97.8	22.7	106
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		100	105	97.8	22.7	106
Colour, true	----	E329/VA	5.0	CU		22.3	38.8	28.3	181	27.4
Conductivity	----	E100/VA	2.0	µS/cm		227	218	203	122	227
Hardness (as CaCO3), dissolved	----	EC100/VA	0.50	mg/L		114	111	106	54.1	119
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.50	mg/L		142	213	146	79.6	148
pH	----	E108/VA	0.10	pH units		8.03	8.01	8.05	7.21	8.07
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		219	241	204	174	254
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		240	1200	559	1080	361
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		0.0173	0.0304	0.0130	0.0463	0.0149
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L		0.068	0.086	0.061	0.086	0.068
Kjeldahl nitrogen, total [TKN]	----	EC318/VA	0.050	mg/L		0.191	0.840	0.437	1.35	0.351
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		0.0769	0.0719	0.124	0.0088	0.0862
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		0.268	0.912	0.561	1.36	0.437
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	0.0010	mg/L		0.0045	0.0053	0.0046	0.0079	0.0043
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		0.245	1.25	0.545	1.05	0.372
Phosphorus, total dissolved	7723-14-0	E375-T/VA	0.0020	mg/L		0.0072	0.0088	0.0067	0.0192	0.0077
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L		20.3	13.2	8.65	28.6	18.1
Nitrate + Nitrite (as N)	----	EC235.N+N/VA	0.0032	mg/L		0.0769	0.0719	0.124	0.0088	0.0862
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		5.94	9.05	6.62	32.8	6.68
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		6.29	24.0	14.0	39.7	11.9

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	PD1	MD	PINE	BEA	PD2
					Client sampling date / time	03-Jun-2022 11:45	03-Jun-2022 16:00	03-Jun-2022 11:15	03-Jun-2022 09:35	03-Jun-2022 10:10
						FJ2201438-001	FJ2201438-002	FJ2201438-003	FJ2201438-004	FJ2201438-005
						Result	Result	Result	Result	Result
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		3.60	9.73	3.47	8.32	4.65
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00030	0.00048	0.00027	0.00041	0.00035
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00300	0.00816	0.00316	0.0102	0.00409
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.209	0.610	0.266	0.451	0.253
Beryllium, total	7440-41-7	E420/VA	0.000020	mg/L		0.000248	0.000786	0.000272	0.000794	0.000311
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		0.000054	0.000146	<0.000050	0.000159	0.000075
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.011	0.018	0.010	0.029	0.012
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.000332	0.00106	0.000431	0.000709	0.000417
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		39.2	58.3	41.2	20.1	41.1
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000835	0.00192	0.000722	0.00210	0.00113
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		0.00612	0.0171	0.00587	0.0156	0.00812
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.00299	0.0107	0.00373	0.0116	0.00400
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.00900	0.0298	0.00939	0.0278	0.0116
Iron, total	7439-89-6	E420/VA	0.010	mg/L		6.80	21.7	8.17	24.1	9.66
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.00365	0.0134	0.00509	0.0127	0.00496
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0072	0.0183	0.0077	0.0183	0.0089
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		10.6	16.4	10.4	7.13	11.1
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.112	0.462	0.175	0.353	0.154
Mercury, total	7439-97-6	E508-L/VA	0.50	ng/L		13.3	70.9	37.0	48.6	31.6
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.00125	0.00102	0.000785	0.000784	0.00125
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.0115	0.0367	0.0127	0.0372	0.0150
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		0.295	1.06	0.482	0.780	0.365
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		1.77	3.30	1.50	3.40	2.02
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00854	0.0187	0.00810	0.0185	0.0104
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.000596	0.000732	0.000541	0.000761	0.000693
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		7.49	16.3	6.00	13.2	8.64
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.000071	0.000182	0.000068	0.000191	0.000098
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		2.06	2.19	1.44	4.44	2.04
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.147	0.161	0.118	0.0985	0.150
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		7.16	5.29	3.17	10.5	6.76

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	PD1	MD	PINE	BEA	PD2
					Client sampling date / time	03-Jun-2022 11:45	03-Jun-2022 16:00	03-Jun-2022 11:15	03-Jun-2022 09:35	03-Jun-2022 10:10
						FJ2201438-001	FJ2201438-002	FJ2201438-003	FJ2201438-004	FJ2201438-005
						Result	Result	Result	Result	Result
Total Metals										
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		0.000104	0.000242	0.000103	0.000216	0.000138
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		0.00094	0.00282	0.00096	0.00369	0.00132
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		0.0355	0.0538	0.0184	0.0322	0.0359
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.000750	0.00132	0.000591	0.00137	0.000800
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.0146	0.0362	0.0140	0.0321	0.0183
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		0.0352	0.111	0.0414	0.117	0.0467
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	<0.00020	<0.00020	0.00067	<0.00020
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.0231	0.0192	0.0235	0.0718	0.0295
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L		0.00011	0.00015	0.00012	0.00017	0.00013
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L		0.00024	0.00040	0.00017	0.00066	0.00022
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.0552	0.0829	0.0660	0.0302	0.0601
Beryllium, dissolved	7440-41-7	E421/VA	0.000020	mg/L		<0.000020	<0.000020	<0.000020	0.000037	<0.000020
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L		<0.010	<0.010	<0.010	0.019	<0.010
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L		0.0000127	0.0000150	0.0000106	0.0000352	0.0000141
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		32.0	30.5	30.4	15.1	34.1
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L		0.00016	0.00017	0.00015	0.00062	0.00014
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L		0.00117	0.00148	0.00100	0.00296	0.00120
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.038	0.047	0.050	0.449	0.050
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L		<0.000050	0.000054	0.000055	0.000177	<0.000050
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L		0.0032	0.0040	0.0034	0.0052	0.0034
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L		8.20	8.48	7.28	3.99	8.34
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.00762	0.0131	0.00544	0.0501	0.00627
Mercury, dissolved	7439-97-6	E509-L/VA	0.50	ng/L		1.48	1.52	2.41	4.57	1.82

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	PD1	MD	PINE	BEA	PD2
					Client sampling date / time	03-Jun-2022 11:45	03-Jun-2022 16:00	03-Jun-2022 11:15	03-Jun-2022 09:35	03-Jun-2022 10:10
						FJ2201438-001	FJ2201438-002	FJ2201438-003	FJ2201438-004	FJ2201438-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L		0.00109	0.000615	0.000594	0.000390	0.00114
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L		0.00159	0.00202	0.00119	0.00527	0.00160
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L		0.759	1.17	0.510	1.69	0.720
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00032	0.00035	<0.00020	0.00059	0.00029
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L		0.000442	0.000240	0.000418	0.000255	0.000502
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L		2.14	1.70	1.48	2.00	2.01
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L		1.99	2.00	1.43	4.62	1.98
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.131	0.0844	0.0932	0.0588	0.126
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		6.52	4.55	2.73	8.94	5.89
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00014	<0.00010
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L		0.00054	0.00032	<0.00030	0.00087	0.00086
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		0.000598	0.000461	0.000244	0.000252	0.000484
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		<0.00050	<0.00050	0.00052	0.00068	0.00054
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium, dissolved	7440-67-7	E421/VA	0.00030	mg/L		<0.00030	<0.00030	<0.00030	0.00064	<0.00030
Dissolved MeHg filtration location	----	EP537/VA	-	-		Field	Field	Field	Field	Field
Dissolved mercury filtration location	----	EP509-L/VA	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/VA	-	-		Field	Field	Field	Field	Field
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	0.000000020	mg/L		<0.000000020 DLM	0.000000328 DLM	<0.000000200 DLM	<0.000000020 DLM	<0.000000020 DLM
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	0.000000020	mg/L		<0.000000020	<0.000000020	0.000000024	0.000000147	0.000000022

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.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	PR3	----	----	----	----
				Client sampling date / time	03-Jun-2022 14:50	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	FJ2201438-006	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L	105	----	----	----	----
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, total (as CaCO3)	----	E290/VA	1.0	mg/L	105	----	----	----	----
Colour, true	----	E329/VA	5.0	CU	24.2	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm	235	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA	0.50	mg/L	123	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.50	mg/L	135	----	----	----	----
pH	----	E108/VA	0.10	pH units	8.09	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	208	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	130	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	0.0080	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L	<0.50	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	0.063	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA	0.050	mg/L	0.204	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.0715	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	<0.0010	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	0.276	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	0.0010	mg/L	0.0043	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	0.170	----	----	----	----
Phosphorus, total dissolved	7723-14-0	E375-T/VA	0.0020	mg/L	0.0058	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	21.4	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/VA	0.0032	mg/L	0.0715	----	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	6.13	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L	7.86	----	----	----	----
Total Metals									

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	----	----	----	----
					Client sampling date / time	03-Jun-2022 14:50	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2201438-006	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		2.31	----	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00026	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00208	----	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.143	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000020	mg/L		0.000147	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		<0.010	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.000244	----	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		36.6	----	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000578	----	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		0.00405	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.00186	----	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.00608	----	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		4.30	----	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.00227	----	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0051	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		10.5	----	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.0694	----	----	----	----
Mercury, total	7439-97-6	E508-L/VA	0.50	ng/L		15.5	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.00133	----	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.00773	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		0.212	----	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		1.41	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00587	----	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.000761	----	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		5.64	----	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.000046	----	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		2.03	----	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.154	----	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		7.90	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	----	----	----	----
					Client sampling date / time	03-Jun-2022 14:50	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2201438-006	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		0.000078	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		0.00063	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		0.0242	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.000700	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.0101	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		0.0240	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.0230	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L		0.00012	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L		0.00021	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.0513	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	0.000020	mg/L		<0.000020	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L		<0.010	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L		0.0000162	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		34.6	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L		0.00012	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L		0.00118	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.039	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L		0.0033	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L		8.83	----	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.00584	----	----	----	----
Mercury, dissolved	7439-97-6	E509-L/VA	0.50	ng/L		1.53	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	----	----	----	----
					Client sampling date / time	03-Jun-2022 14:50	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2201438-006	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L		0.00129	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L		0.00154	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L		<0.050	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L		0.651	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00030	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L		0.000530	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L		2.24	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L		2.00	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.140	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		6.97	----	----	----	----
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		0.00064	----	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		0.000535	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		0.00053	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		<0.0010	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	0.00030	mg/L		<0.00030	----	----	----	----
Dissolved MeHg filtration location	----	EP537/VA	-	-		Field	----	----	----	----
Dissolved mercury filtration location	----	EP509-L/VA	-	-		Field	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-	-		Field	----	----	----	----
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	0.000000020	mg/L		<0.000000020 DLM	----	----	----	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	0.000000020	mg/L		<0.000000020	----	----	----	----

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	: **FJ2201438**	Page	: 1 of 27
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 03-Jun-2022 16:50
PO	: 1200-25.03.02	Issue Date	: 06-Jun-2023 14:36
C-O-C number	: 2022-June-MON8/9		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BEA	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MD	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD1	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD2	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PINE	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR3	E298	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEA	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE MD	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD1	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR3	E235.Cl	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3	E378-U	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3	E235.F	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PINE	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR3	E235.NO3-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE BEA	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrite in Water by IC (Low Level)										
HDPE PD1	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3	E235.NO2-L	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MD	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3	E235.SO4	03-Jun-2022	05-Jun-2022	----	----		05-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PINE	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3	E375-T	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) BEA	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MD	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD1	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PINE	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR3	E366	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MD	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD1	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PINE	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3	E372-U	03-Jun-2022	09-Jun-2022	----	----		10-Jun-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) BEA	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) MD	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD1	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD2	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PINE	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR3	E509-L	03-Jun-2022	01-Jul-2022	----	----		01-Jul-2022	28 days	28 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) BEA	E421	03-Jun-2022	21-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD2	E421	03-Jun-2022	21-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PINE	E421	03-Jun-2022	21-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR3	E421	03-Jun-2022	21-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MD	E421	03-Jun-2022	21-Jun-2022	----	----		25-Jun-2022	180 days	22 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD1	E421	03-Jun-2022	21-Jun-2022	----	----		25-Jun-2022	180 days	22 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MD	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD1	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3	E358-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MD	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PINE	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3	E355-L	03-Jun-2022	09-Jun-2022	----	----		09-Jun-2022	28 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MD	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD1	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PINE	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3	E290	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE BEA	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE MD	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PINE	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PR3	E329	03-Jun-2022	05-Jun-2022	----	----		06-Jun-2022	3 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE MD	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD1	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3	E100	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE MD	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	119 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	120 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD1	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	123 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	124 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PD2	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	125 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE BEA	E108	03-Jun-2022	05-Jun-2022	----	----		08-Jun-2022	0.25 hrs	126 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MD	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD1	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PINE	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 PR3	E162	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3	E160	03-Jun-2022	----	----	----		06-Jun-2022	7 days	3 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) MD	E537	03-Jun-2022	05-Jul-2022	180 days	32 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD1	E537	03-Jun-2022	05-Jul-2022	180 days	32 days	✓	05-Jul-2022	180 days	0 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PINE	E537	03-Jun-2022	05-Jul-2022	180 days	32 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PR3	E537	03-Jun-2022	05-Jul-2022	180 days	32 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
BEA	E537	03-Jun-2022	05-Jul-2022	180 days	33 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid)										
PD2	E537	03-Jun-2022	05-Jul-2022	180 days	33 days	✓	05-Jul-2022	180 days	0 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
BEA	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
MD	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
PD1	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
PD2	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid)										
PINE	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR3	E536	03-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	180 days	33 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) BEA	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) MD	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD1	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD2	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PINE	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR3	E508-L	03-Jun-2022	24-Jun-2022	----	----		24-Jun-2022	28 days	21 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) BEA	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) MD	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD1	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD2	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PINE	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR3	E420	03-Jun-2022	22-Jun-2022	----	----		24-Jun-2022	180 days	21 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	511875	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511883	1	7	14.2	5.0	✓
Conductivity in Water	E100	511874	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	545979	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	530231	2	40	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511884	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
pH by Meter	E108	511873	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	537159	1	18	5.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	532540	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	550566	2	20	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	511875	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511883	1	7	14.2	5.0	✓
Conductivity in Water	E100	511874	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	545979	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	530231	2	40	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511884	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
pH by Meter	E108	511873	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	537159	1	18	5.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	532540	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	550566	2	20	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	511875	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	511883	1	7	14.2	5.0	✓
Conductivity in Water	E100	511874	1	14	7.1	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	545979	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	530231	2	40	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511884	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	513245	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	537159	1	18	5.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	532540	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	550566	2	20	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	513244	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	517459	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Chloride in Water by IC	E235.Cl	511877	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	545979	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	530231	2	40	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	548832	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	517454	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	511884	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	511876	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	511878	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	511879	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	511880	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	517458	1	20	5.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	537159	1	18	5.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	532540	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	550566	2	20	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	517456	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	517455	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	517457	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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 CVAFS (Low Level, LOR = 0.5 ppt)	E508-L Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L Vancouver - Environmental	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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 Vancouver - Environmental	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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 Vancouver - Environmental	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.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Vancouver - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Kjeldahl Nitrogen (Calculation)	EC318 Vancouver - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration (Low Level)	EP509-L Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Methylmercury Water Preparation	EP537 Vancouver - Environmental	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2201438**	Page	: 1 of 23
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 03-Jun-2022 16:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 05-Jun-2022
C-O-C number	: 2022-June-MON8/9	Issue Date	: 06-Jun-2023 14:36
Sampler	: Pat Beaupre 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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: 511873)											
FJ2201438-001	PD1	pH	----	E108	0.10	pH units	8.03	8.04	0.124%	4%	----
Physical Tests (QC Lot: 511874)											
FJ2201438-001	PD1	Conductivity	----	E100	2.0	µS/cm	227	227	0.00%	10%	----
Physical Tests (QC Lot: 511875)											
FJ2201438-001	PD1	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	100	97.4	2.63%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	100	97.4	2.63%	20%	----
Physical Tests (QC Lot: 511883)											
FJ2201438-001	PD1	Colour, true	----	E329	5.0	CU	22.3	24.2	2.0	Diff <2x LOR	----
Physical Tests (QC Lot: 513244)											
FJ2201370-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	15.7	17.1	1.4	Diff <2x LOR	----
Physical Tests (QC Lot: 513245)											
FJ2201370-002	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	2040	2340	13.7%	20%	----
Anions and Nutrients (QC Lot: 511876)											
VA22B2224-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	<0.200	0.168	0.032	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511877)											
VA22B2224-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511878)											
VA22B2224-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511879)											
VA22B2224-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511880)											
VA22B2224-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	0.50	0.49	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 511884)											
FJ2201438-001	PD1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0045	0.0048	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517456)											
FJ2201421-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.172	0.170	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517457)											
FJ2201421-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0398	0.0426	6.82%	20%	----

Sub-Matrix: **Water**

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Anions and Nutrients (QC Lot: 517458)											
FJ2201421-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0036	0.0029	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 517459)											
FJ2201421-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 517454)											
FJ2201421-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.43	3.59	0.16	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 517455)											
FJ2201421-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.73	3.72	0.01	Diff <2x LOR	----
Total Metals (QC Lot: 532540)											
KS2202096-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0060	mg/L	0.0179	0.0156	0.0023	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00020	mg/L	0.0270	0.0274	1.49%	20%	----
		Barium, total	7440-39-3	E420	0.00020	mg/L	0.0154	0.0153	0.716%	20%	----
		Beryllium, total	7440-41-7	E420	0.000040	mg/L	<0.000040	<0.000040	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	0.190	0.193	0.003	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.100	mg/L	18.6	19.0	1.94%	20%	----
		Cesium, total	7440-46-2	E420	0.000020	mg/L	0.000049	0.000053	0.000004	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	<0.00020	<0.00020	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.020	mg/L	0.154	0.156	0.002	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0020	mg/L	0.0027	0.0028	0.00005	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0100	mg/L	11.2	10.9	2.98%	20%	----
		Manganese, total	7439-96-5	E420	0.00020	mg/L	0.119	0.122	2.09%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.784	0.819	4.36%	20%	----
		Nickel, total	7440-02-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		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	12.8	13.1	3.04%	20%	----
		Rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00503	0.00529	5.00%	20%	----
		Selenium, total	7782-49-2	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.20	mg/L	6.56	6.66	1.41%	20%	----
		Silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----

Sub-Matrix: **Water**

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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: 532540) - continued											
KS2202096-001	Anonymous	Sodium, total	7440-23-5	E420	0.100	mg/L	359	353	1.78%	20%	----
		Strontium, total	7440-24-6	E420	0.00040	mg/L	0.855	0.874	2.17%	20%	----
		Sulfur, total	7704-34-9	E420	1.00	mg/L	215	218	1.58%	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	<0.000020	<0.000020	0	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	0.00180	mg/L	<0.00180	<0.00180	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00020	mg/L	0.00109	0.00114	0.00006	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000020	mg/L	0.00162	0.00166	2.74%	20%	----
		Vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Total Metals (QC Lot: 537159)											
CG2207669-001	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 530231)											
CG2207669-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0018	0.0018	0.00004	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00026	0.00026	0.000006	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00045	0.00045	0.000003	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0110	0.0107	3.24%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<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	0.034	0.034	0.0006	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.280 µg/L	0.000272	2.77%	20%	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	259	252	2.69%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000060	0.000058	0.000002	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	16.2 µg/L	0.0160	1.24%	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	0.033	0.032	0.001	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0993	0.0984	0.870%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	160	156	2.75%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.463	0.460	0.553%	20%	----

Sub-Matrix: **Water**

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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: 530231) - continued											
CG2207669-001	Anonymous	Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0171	0.0167	2.78%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0627	0.0611	2.64%	20%	----
		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	4.54	4.40	3.09%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00467	0.00445	4.99%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	2.24 µg/L	0.00205	9.03%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.86	2.72	5.13%	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	10.2	10.0	1.92%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.412	0.396	4.12%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	315	304	3.50%	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	0.000102	0.000099	2.75%	20%	----
		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	0.0123	0.0120	2.80%	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	0.0246	0.0238	3.13%	20%	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 530290)											
FJ2201438-003	PINE	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0235	0.0246	4.77%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00012	0.00012	0.000003	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00017	0.00019	0.00002	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0660	0.0687	4.02%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000106	0.0000147	0.0000040	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	30.4	31.9	4.67%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00015	0.00014	0.000005	Diff <2x LOR	----

Sub-Matrix: **Water**

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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: 530290) - continued											
FJ2201438-003	PINE	Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00100	0.00103	0.00003	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.050	0.052	0.002	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000055	0.000059	0.000003	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0034	0.0034	0.00002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.28	7.24	0.594%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00544	0.00550	1.24%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000594	0.000563	5.41%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00119	0.00127	0.00008	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.510	0.522	2.17%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	<0.00020	0.00025	0.00005	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000418	0.000346	0.000072	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.48	1.47	0.604%	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	1.43	1.42	0.746%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0932	0.0936	0.403%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	2.73	2.72	0.007	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	0.000244	0.000245	0.185%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00052	0.00051	0.000007	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 545979)											
FJ2201438-001	PD1	Mercury, dissolved	7439-97-6	E509-L	0.50	ng/L	1.48	1.44	0.04	Diff <2x LOR	----
Speciated Metals (QC Lot: 548832)											
FJ2201394-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 550566)											
FC2201151-001	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	0.000032	0.000032	0.0000002	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*
Speciated Metals (QC Lot: 552337)											
FJ2201438-001	PD1	Methylmercury (as MeHg), total	22967-92-6	E536	0.000200	µg/L	<0.000000200 mg/L	<0.000200	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: 511874)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 511875)						
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, total (as CaCO3)	----	E290	1	mg/L	1.0	----
Physical Tests (QCLot: 511883)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 513244)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 513245)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 511876)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 511877)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 511878)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 511879)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 511880)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 511884)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 517456)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 517457)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 517458)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 517459)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 517454)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 517455)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 532540)						
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: 532540) - 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: 537159)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 530231)						
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: 530231) - 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: 530290)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 530290) - continued						
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 545979)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 548832)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 550566)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 552337)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 511873)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 511874)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 511875)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.8	85.0	115	----
Physical Tests (QCLot: 511883)									
Colour, true	----	E329	5	CU	100 CU	105	85.0	115	----
Physical Tests (QCLot: 513244)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	103	85.0	115	----
Physical Tests (QCLot: 513245)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	107	85.0	115	----
Anions and Nutrients (QCLot: 511876)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 511877)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 511878)									
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: 511879)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.5	90.0	110	----
Anions and Nutrients (QCLot: 511880)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 511884)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	96.5	80.0	120	----
Anions and Nutrients (QCLot: 517456)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 517457)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.7	80.0	120	----
Anions and Nutrients (QCLot: 517458)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.3	80.0	120	----
Anions and Nutrients (QCLot: 517459)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.9	85.0	115	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 517454)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 517455)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Total Metals (QCLot: 532540)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	98.6	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	98.8	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	93.5	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	94.7	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	95.0	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	94.8	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	95.8	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	91.6	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	97.4	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	96.3	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	98.5	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	107	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	95.8	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	97.8	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.0	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	96.8	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	97.3	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.5	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	99.7	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	99.9	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	95.1	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	98.2	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.1	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	97.0	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	99.6	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	90.1	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 532540) - continued									
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	95.4	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	85.8	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	90.4	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	92.5	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	91.5	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	88.6	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	99.1	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.7	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	96.8	80.0	120	----
Total Metals (QCLot: 537159)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	104	80.0	120	----
Dissolved Metals (QCLot: 530231)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	95.3	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.9	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.4	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	95.9	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.3	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	91.0	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.2	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.1	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	97.3	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	96.4	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.1	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	98.7	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	94.9	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	96.1	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.4	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.6	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	97.1	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	95.8	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	103	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	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 530231) - continued									
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.3	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	93.3	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	111	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	95.4	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.9	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	95.4	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	96.5	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	94.4	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	105	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.7	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	96.7	80.0	120	----
Dissolved Metals (QCLot: 530290)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	98.2	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.0	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	99.0	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	99.9	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	99.3	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	99.0	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	99.8	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	99.6	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.4	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	99.9	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	103	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 530290) - continued									
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.8	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	96.8	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	103	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	99.7	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	99.5	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	98.7	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	80.6	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	102	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	97.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	94.4	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.6	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.1	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	106	80.0	120	----
Speciated Metals (QCLot: 548832)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	71.0	70.0	130	----
Speciated Metals (QCLot: 550566)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	85.8	70.0	130	----
Speciated Metals (QCLot: 552337)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	83.7	70.0	130	----

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: 511876)										
VA22B2224-002	Anonymous	Fluoride	16984-48-8	E235.F	1.14 mg/L	1 mg/L	114	75.0	125	----
Anions and Nutrients (QCLot: 511877)										
VA22B2224-002	Anonymous	Chloride	16887-00-6	E235.Cl	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 511878)										
VA22B2224-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.67 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 511879)										
VA22B2224-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.534 mg/L	0.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 511880)										
VA22B2224-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 511884)										
FJ2201438-002	MD	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0319 mg/L	0.03 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 517456)										
FJ2201421-002	Anonymous	Nitrogen, total	7727-37-9	E366	0.399 mg/L	0.4 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 517457)										
FJ2201421-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0478 mg/L	0.05 mg/L	95.6	70.0	130	----
Anions and Nutrients (QCLot: 517458)										
FJ2201421-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0497 mg/L	0.05 mg/L	99.4	70.0	130	----
Anions and Nutrients (QCLot: 517459)										
FJ2201421-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.110 mg/L	0.1 mg/L	110	75.0	125	----
Organic / Inorganic Carbon (QCLot: 517454)										
FJ2201421-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.92 mg/L	5 mg/L	98.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 517455)										
FJ2201421-002	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.08 mg/L	5 mg/L	102	70.0	130	----
Total Metals (QCLot: 532540)										
KS2202096-002	Anonymous	Aluminum, total	7429-90-5	E420	0.379 mg/L	0.4 mg/L	94.7	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0377 mg/L	0.04 mg/L	94.3	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		Barium, total	7440-39-3	E420	0.0374 mg/L	0.04 mg/L	93.6	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: 532540) - continued										
KS2202096-002	Anonymous	Beryllium, total	7440-41-7	E420	0.0746 mg/L	0.08 mg/L	93.2	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0177 mg/L	0.02 mg/L	88.6	70.0	130	----
		Boron, total	7440-42-8	E420	0.177 mg/L	0.2 mg/L	88.6	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00762 mg/L	0.008 mg/L	95.3	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	8 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0746 mg/L	0.08 mg/L	93.2	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0370 mg/L	0.04 mg/L	92.6	70.0	130	----
		Copper, total	7440-50-8	E420	0.0368 mg/L	0.04 mg/L	92.0	70.0	130	----
		Iron, total	7439-89-6	E420	3.79 mg/L	4 mg/L	94.8	70.0	130	----
		Lead, total	7439-92-1	E420	0.0353 mg/L	0.04 mg/L	88.2	70.0	130	----
		Lithium, total	7439-93-2	E420	0.179 mg/L	0.2 mg/L	89.6	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0751 mg/L	0.08 mg/L	93.8	70.0	130	----
		Phosphorus, total	7723-14-0	E420	20.1 mg/L	20 mg/L	101	70.0	130	----
		Potassium, total	7440-09-7	E420	ND mg/L	8 mg/L	ND	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0799 mg/L	0.08 mg/L	99.8	70.0	130	----
		Silicon, total	7440-21-3	E420	18.2 mg/L	20 mg/L	90.9	70.0	130	----
		Silver, total	7440-22-4	E420	0.00695 mg/L	0.008 mg/L	86.9	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0715 mg/L	0.08 mg/L	89.4	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00693 mg/L	0.008 mg/L	86.6	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0368 mg/L	0.04 mg/L	92.1	70.0	130	----
		Tin, total	7440-31-5	E420	0.0345 mg/L	0.04 mg/L	86.2	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0743 mg/L	0.08 mg/L	92.9	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0354 mg/L	0.04 mg/L	88.6	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00682 mg/L	0.008 mg/L	85.3	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.201 mg/L	0.2 mg/L	101	70.0	130	----
		Zinc, total	7440-66-6	E420	0.767 mg/L	0.8 mg/L	95.8	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0791 mg/L	0.08 mg/L	98.8	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: 537159)										
CG2207669-002	Anonymous	Mercury, total	7439-97-6	E508-L	5.47 ng/L	5 ng/L	109	70.0	130	----
Dissolved Metals (QCLot: 530231)										
CG2207669-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.195 mg/L	0.2 mg/L	97.5	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0366 mg/L	0.04 mg/L	91.5	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00844 mg/L	0.01 mg/L	84.4	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.091 mg/L	0.1 mg/L	90.8	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00374 mg/L	0.004 mg/L	93.5	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00973 mg/L	0.01 mg/L	97.3	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0180 mg/L	0.02 mg/L	90.0	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0184 mg/L	0.02 mg/L	92.0	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.90 mg/L	2 mg/L	94.8	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0180 mg/L	0.02 mg/L	90.2	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.5 mg/L	10 mg/L	105	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.06 mg/L	10 mg/L	90.6	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00368 mg/L	0.004 mg/L	91.9	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00360 mg/L	0.004 mg/L	89.9	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0190 mg/L	0.02 mg/L	95.1	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: 530231) - continued										
CG2207669-002	Anonymous	Titanium, dissolved	7440-32-6	E421	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0184 mg/L	0.02 mg/L	92.2	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0994 mg/L	0.1 mg/L	99.4	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.371 mg/L	0.4 mg/L	92.7	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 530290)										
FJ2201438-004	BEA	Aluminum, dissolved	7429-90-5	E421	0.186 mg/L	0.2 mg/L	92.9	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0187 mg/L	0.02 mg/L	93.3	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0394 mg/L	0.04 mg/L	98.6	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00911 mg/L	0.01 mg/L	91.1	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	0.00386 mg/L	0.004 mg/L	96.5	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00947 mg/L	0.01 mg/L	94.7	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.84 mg/L	2 mg/L	91.9	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0190 mg/L	0.02 mg/L	95.3	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0978 mg/L	0.1 mg/L	97.8	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0370 mg/L	0.04 mg/L	92.6	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.58 mg/L	10 mg/L	95.8	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.72 mg/L	4 mg/L	93.0	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	8.96 mg/L	10 mg/L	89.6	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00392 mg/L	0.004 mg/L	98.0	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----

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: 530290) - continued										
FJ2201438-004	BEA	Sulfur, dissolved	7704-34-9	E421	18.6 mg/L	20 mg/L	93.0	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00376 mg/L	0.004 mg/L	94.0	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0366 mg/L	0.04 mg/L	91.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00377 mg/L	0.004 mg/L	94.4	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0936 mg/L	0.1 mg/L	93.6	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.378 mg/L	0.4 mg/L	94.5	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: 545979)										
FJ2201438-002	MD	Mercury, dissolved	7439-97-6	E509-L	4.85 ng/L	5 ng/L	97.0	70.0	130	----
Speciated Metals (QCLot: 548832)										
FJ2201394-002	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00215 µg/L	0.0025 µg/L	86.0	70.0	130	----
Speciated Metals (QCLot: 550566)										
FJ2201456-006	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.0204 µg/L	0.0025 µg/L	81.4	70.0	130	----
Speciated Metals (QCLot: 552337)										
FJ2201438-002	MD	Methylmercury (as MeHg), total	22967-92-6	E536	0.0215 µg/L	0.0025 µg/L	86.0	60.0	140	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page

Environmental Division
Fort St. John
Work Order Reference
FJ2201438

Telephone : +1 250 261 5517

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
Same day [E2] if received by 10am M-S - 200% rush surcharge. A
☐ fees may apply to rush requests on weekends, statutory holidays an
routine tests
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please cont

Project Information

ALS Account # / Quote #: VA22-ECOF100-004
Job #: Surface water MON8/9- with metals
PO / AFE: 1200-25.03.02
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Analysis Requ

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

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	Colour (true)	Alkalinity Species	Conductivity, pH, TDS, TSS	TOC	DOC	Chlorophyll-a	Ammonia	Anions	DO Phos	TKN, TN, Tot Phos, TD Phos	Total Metals + Hardness + Hg	Diss. Metals + Hardness + Hg	Total Methyl Hg	Diss. Methyl Hg	SAMPLES ON HOLD	EXTENDED STORAGE REQUIR	SUSPECTED HAZARD (see no
	PD1	03 JUN 22	11:45	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	MD	03 JUN 22	16:00	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	PINE	03 JUN 22	11:15	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	BEA	03 JUN 22	09:35	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	PD2	03 JUN 22	10:10	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	PR3	03 JUN 22	14:50	Water	9	R	R	R	R	R	-	R	R	R	R	R	R	R	R			
	~~M1 Shallow~~			~~Water~~		R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	~~M1 Deep~~			~~Water~~		R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	~~D1 Shallow~~			~~Water~~		R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	~~D1 Deep~~			~~Water~~		R	R	R	R	R	R	R	R	R	R	R	R	R	R			
	~~Travel Blank~~			~~Water~~		R	R	R	R	R	R	R	R	R	R	R	R	R	R			

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

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System? ☐ ☑ NO
Are samples for human consumption/ use? ☐ ☑ NO

Notes: Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
6.3	7°C AVG OF 6 coolers

SHIPMENT RELEASE (client use)

Released by: Date: 2022-06-03 Time: 16:55

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: 6-3-22 Time: 4:50

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Jun 05 / 22 Time: 10:15

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

AUG 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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201956**	Page	: 1 of 5
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 1	Issue Date	: 25-Aug-2023 17:56
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Jenna Smith	Account Manager	Administration, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sean Zhang	Account Manager	Administration, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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
µg/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
L	litres
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	CG ALS Environmental - Calgary	2559 29th Street NE, Calgary, AB
B	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (10/5/2023): This report has been amended and re-released to allow the reporting of additional analytical data. Added ug/L Calculation data for Chlorophyll-a.
Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
						Client sampling date / time	25-Jul-2022 08:10	25-Jul-2022 07:35	25-Jul-2022 10:20	25-Jul-2022 10:45	25-Jul-2022 00:00
							FJ2201956-001	FJ2201956-002	FJ2201956-003	FJ2201956-004	FJ2201956-005
							Result	Result	Result	Result	Result
Field Tests											
Sampling volume, field	----	EF003/CG		0.010	L		0.070	0.070	0.070	0.070	0.070
Sample Preparation											
Volume filtered	----	EF870B/CG		0.001	L		0.070	0.070	0.070	0.070	0.070
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		108	86.4	92.2	87.7	<1.0
Alkalinity, carbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, phenolphthalein (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	A	1.0	mg/L		108	86.4	92.2	87.7	<1.0
Colour, true	----	E329/CG	A	5.0	CU		5.1	5.4	5.3	5.3	<5.0
Conductivity	----	E100/CG	A	2.0	µS/cm		174	175	177	178	<2.0
Hardness (as CaCO3), dissolved	----	EC100/CG		0.50	mg/L		89.6	90.0	91.6	90.6	<0.50
pH	----	E108/CG	A	0.10	pH units		8.08	8.05	8.09	8.03	5.57
Solids, total dissolved [TDS]	----	E162/CG	A	10	mg/L		132	118	119	120	<10
Solids, total suspended [TSS]	----	E160/CG	A	3.0	mg/L		<3.0	4.5	<3.0	<3.0	<3.0
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/CG	A	0.0050	mg/L		0.0095	0.0092	<0.0050	<0.0050	<0.0050
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L		0.036	0.036	0.040	0.037	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318/CG	A	0.050	mg/L		0.168	0.106	0.097	0.134	<0.050
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	A	0.0050	mg/L		0.0422	0.0444	0.0376	0.0606	<0.0050
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	EC368/CG		0.050	mg/L		0.210	0.150	0.135	0.195	<0.050
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U/CG	A	0.0020	mg/L		0.0055	0.0080	0.0035	0.0038	<0.0020
Phosphorus, total dissolved	7723-14-0	E375-T/CG	A	0.0020	mg/L		0.0036	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392/VA	B	0.50	mg/L		4.33	4.33	4.38	4.46	<0.50
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L		14.1	14.1	14.6	14.1	<0.30

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
						Client sampling date / time	25-Jul-2022 08:10	25-Jul-2022 07:35	25-Jul-2022 10:20	25-Jul-2022 10:45	25-Jul-2022 00:00
							FJ2201956-001	FJ2201956-002	FJ2201956-003	FJ2201956-004	FJ2201956-005
							Result	Result	Result	Result	Result
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/CG	A	0.50	mg/L		2.45	2.85	3.05	2.76	----
Carbon, total organic [TOC]	----	E355-L/CG	A	0.50	mg/L		2.72	2.61	2.87	2.62	<0.50
Dissolved Metals											
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L		25.6	25.7	26.1	25.9	<0.050
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L		6.24	6.26	6.43	6.31	<0.0050
Dissolved metals filtration location	----	EP421/CG		-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Plant Pigments											
Chlorophyll a	479-61-8	EC870B/VA		0.010	µg/L		3.46	1.68	5.37	1.84	<0.028
Chlorophyll a	479-61-8	E870B/VA	B	0.0020	µg/sample		0.242	0.118	0.376	0.129	<0.0020

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	: **FJ2201956**	Page	: 1 of 22
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:56
C-O-C number	: 2022-July-MON8/9-Day 1		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Deep	E298	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Shallow	E298	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Travel Blank	E298	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Deep	E298	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Shallow	E298	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Deep	E235.Cl	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Shallow	E235.Cl	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE Travel Blank	E235.Cl	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-Deep	E235.Cl	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-Shallow	E235.Cl	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Deep	E378-U	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Shallow	E378-U	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Travel Blank	E378-U	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Deep	E378-U	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Shallow	E378-U	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Deep	E235.F	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Shallow	E235.F	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Travel Blank	E235.F	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Deep	E235.F	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Shallow	E235.F	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO3-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO3-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO3-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO3-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE										
W1-Shallow	E235.NO3-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
D1-Deep	E235.NO2-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
D1-Shallow	E235.NO2-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
W1-Deep	E235.NO2-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
W1-Shallow	E235.NO2-L	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
D1-Deep	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
D1-Shallow	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
Travel Blank	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE W1-Deep	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-Shallow	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Deep	E235.SO4	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Shallow	E235.SO4	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Travel Blank	E235.SO4	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Deep	E235.SO4	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Shallow	E235.SO4	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Deep	E375-T	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E375-T	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	29-Jul-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Deep	E375-T	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E375-T	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-Deep	E318	25-Jul-2022	28-Jul-2022	28 days	3 days	✓	28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-Shallow	E318	25-Jul-2022	28-Jul-2022	28 days	3 days	✓	28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Travel Blank	E318	25-Jul-2022	28-Jul-2022	28 days	3 days	✓	28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-Deep	E318	25-Jul-2022	28-Jul-2022	28 days	3 days	✓	28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-Shallow	E318	25-Jul-2022	28-Jul-2022	28 days	3 days	✓	28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-Deep	E372-U	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-Shallow	E372-U	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Travel Blank	E372-U	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Deep	E372-U	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Shallow	E372-U	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Deep	E421	25-Jul-2022	29-Jul-2022	180 days	4 days	✓	29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Shallow	E421	25-Jul-2022	29-Jul-2022	180 days	4 days	✓	29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Travel Blank	E421	25-Jul-2022	29-Jul-2022	180 days	4 days	✓	29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Deep	E421	25-Jul-2022	29-Jul-2022	180 days	4 days	✓	29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Shallow	E421	25-Jul-2022	29-Jul-2022	180 days	4 days	✓	29-Jul-2022	180 days	4 days	✓
Field Tests : Field Volume (L)										
Opaque HDPE										
D1-Deep	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	0 days	

Matrix: **Water**

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

Analyte Group / 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 : Field Volume (L)										
Opaque HDPE D1-Shallow	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	0 days	
Field Tests : Field Volume (L)										
Opaque HDPE Travel Blank	EF003	25-Jul-2022	----	----	----		24-Jul-2022	----	0 days	
Field Tests : Field Volume (L)										
Opaque HDPE W1-Deep	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	0 days	
Field Tests : Field Volume (L)										
Opaque HDPE W1-Shallow	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	0 days	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Deep	E358-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E358-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Deep	E358-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E358-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Deep	E355-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Shallow	E355-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Travel Blank	E355-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Deep	E355-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Shallow	E355-L	25-Jul-2022	26-Jul-2022	28 days	1 days	✓	27-Jul-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Deep	E290	25-Jul-2022	27-Jul-2022	14 days	2 days	✓	27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Shallow	E290	25-Jul-2022	27-Jul-2022	14 days	2 days	✓	27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	25-Jul-2022	27-Jul-2022	14 days	2 days	✓	27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Deep	E290	25-Jul-2022	27-Jul-2022	14 days	2 days	✓	27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Shallow	E290	25-Jul-2022	27-Jul-2022	14 days	2 days	✓	27-Jul-2022	14 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Deep	E329	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Shallow	E329	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Travel Blank	E329	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Deep	E329	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Shallow	E329	25-Jul-2022	26-Jul-2022	3 days	1 days	✓	26-Jul-2022	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Deep	E100	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Shallow	E100	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Deep	E100	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE W1-Shallow	E100	25-Jul-2022	27-Jul-2022	28 days	2 days	✓	27-Jul-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE D1-Deep	E108	25-Jul-2022	27-Jul-2022	0.25 hrs	50 hrs	× EHTR-FM	27-Jul-2022	0.25 hrs	50 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-Shallow	E108	25-Jul-2022	27-Jul-2022	0.25 hrs	50 hrs	× EHTR-FM	27-Jul-2022	0.25 hrs	50 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	25-Jul-2022	27-Jul-2022	0.25 hrs	52 hrs	× EHTR-FM	27-Jul-2022	0.25 hrs	52 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Shallow	E108	25-Jul-2022	27-Jul-2022	0.25 hrs	52 hrs	× EHTR-FM	27-Jul-2022	0.25 hrs	52 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Deep	E108	25-Jul-2022	27-Jul-2022	0.25 hrs	53 hrs	× EHTR-FM	27-Jul-2022	0.25 hrs	53 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-Deep	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-Shallow	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Travel Blank	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 W1-Deep	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Shallow	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Deep	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Shallow	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Deep	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Shallow	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-Deep	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-Shallow	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE Travel Blank	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-Deep	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-Shallow	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-Deep	EF870B	25-Jul-2022	----	----	----		26-Jul-2022	48 hrs	28 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-Shallow	EF870B	25-Jul-2022	----	----	----		26-Jul-2022	48 hrs	28 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE Travel Blank	EF870B	25-Jul-2022	----	----	----		26-Jul-2022	48 hrs	30 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE W1-Shallow	EF870B	25-Jul-2022	----	----	----		26-Jul-2022	48 hrs	30 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE W1-Deep	EF870B	25-Jul-2022	----	----	----		26-Jul-2022	48 hrs	31 hrs	✓

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	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
pH by Meter	E108	579207	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
pH by Meter	E108	579207	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	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 - Calgary	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 - Calgary	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Calgary	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Calgary	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.
Chloride in Water by IC	E235.Cl ALS Environmental - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Calgary	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Calgary	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Calgary	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 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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Calgary	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Calgary	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.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Calgary	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.
Total Nitrogen (calculation)	EC368 ALS Environmental - Calgary	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B ALS Environmental - Vancouver	Water	CALC	Convert results to sample concentration based on support lab filter information.
Field Volume (L)	EF003 ALS Environmental - Calgary	Water		Field measurement of sampling volume provided by client and recorded on ALS report may affect the validity of results.
Chlorophyll-a Filtration by Support Laboratory	EF870B ALS Environmental - Calgary	Water	EPA 445.0 (mod)	Filtration for chlorophyll-a analysis

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Calgary	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 ALS Environmental - Calgary	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for 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
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Calgary	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2201956**	Page	: 1 of 10
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 1	Issue Date	: 25-Aug-2023 17:56
Sampler	: Pat Beaupre 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Jenna Smith	Account Manager	Calgary Administration, Calgary, Alberta
Katarzyna Glinka	Analyst	Calgary Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sean Zhang	Account Manager	Calgary Administration, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 577365)											
FJ2201956-001	W1-Shallow	Colour, true	----	E329	5.0	CU	5.1	5.0	0.04	Diff <2x LOR	----
Physical Tests (QC Lot: 577697)											
FC2201673-003	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	48.7	47.7	2.07%	20%	----
Physical Tests (QC Lot: 579161)											
CG2209826-003	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	286	269	6.12%	20%	----
Physical Tests (QC Lot: 579162)											
FJ2201956-004	D1-Deep	Solids, total dissolved [TDS]	----	E162	20	mg/L	120	120	0	Diff <2x LOR	----
Physical Tests (QC Lot: 579207)											
CG2209821-001	Anonymous	pH	----	E108	0.10	pH units	8.04	8.08	0.496%	4%	----
Physical Tests (QC Lot: 579208)											
CG2209821-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	406	411	1.22%	10%	----
Physical Tests (QC Lot: 579209)											
CG2209821-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	225	260	14.4%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	225	260	14.4%	20%	----
Anions and Nutrients (QC Lot: 577006)											
CG2209743-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577395)											
FJ2201956-001	W1-Shallow	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0422	0.0396	0.0026	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577396)											
FJ2201956-001	W1-Shallow	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.1	14.1	0.0718%	20%	----
Anions and Nutrients (QC Lot: 577397)											
FJ2201956-001	W1-Shallow	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577398)											
FJ2201956-001	W1-Shallow	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.036	0.036	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577399)											
FJ2201956-001	W1-Shallow	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 577534)											
CG2209725-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.800	mg/L	11.6	11.3	2.54%	20%	----
Anions and Nutrients (QC Lot: 577766)											
CG2209815-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 578760)											
CG2209739-011	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0080	0.0085	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 578761)											
FJ2201956-002	W1-Deep	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0080	0.0059	0.0021	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 579493)											
FC2201686-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0212	0.0203	4.34%	20%	----
Anions and Nutrients (QC Lot: 579612)											
EO2205774-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	14.1	14.2	0.520%	20%	----
Organic / Inorganic Carbon (QC Lot: 577245)											
CG2209746-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 577246)											
CG2209746-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.17	1.46	0.71	Diff <2x LOR	----
Dissolved Metals (QC Lot: 581382)											
CG2209952-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	95.0	94.3	0.687%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	43.0	42.5	1.12%	20%	----
Plant Pigments (QC Lot: 583708)											
FJ2201956-001	W1-Shallow	Chlorophyll a	479-61-8	E870B	0.0020	µg/sample	0.242	0.218	10.9%	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: 577365)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 577697)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 579161)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 579162)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 579208)						
Conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 579209)						
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	----
Anions and Nutrients (QCLot: 577006)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 577395)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 577396)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 577397)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 577398)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 577399)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 577534)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 577766)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 578760)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 578760) - continued						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 578761)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 579493)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 579612)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 577245)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 577246)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 581382)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Plant Pigments (QCLot: 583708)						
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	<0.0020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 577365)									
Colour, true	----	E329	5	CU	100 CU	96.3	85.0	115	----
Physical Tests (QCLot: 577697)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.8	85.0	115	----
Physical Tests (QCLot: 579161)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 579162)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 579207)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 579208)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.7	90.0	110	----
Physical Tests (QCLot: 579209)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	117	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Anions and Nutrients (QCLot: 577006)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 577395)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 577396)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 577397)									
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: 577398)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 577399)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 577534)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 577766)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	112	85.0	115	----
Anions and Nutrients (QCLot: 578760)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 578760) - continued									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	109	80.0	120	----
Anions and Nutrients (QCLot: 578761)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 579493)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	94.1	80.0	120	----
Anions and Nutrients (QCLot: 579612)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Organic / Inorganic Carbon (QCLot: 577245)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 577246)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 581382)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	80.0	120	----
Plant Pigments (QCLot: 583708)									
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	99.0	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: 577006)										
CG2209743-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0544 mg/L	0.05 mg/L	109	70.0	130	----
Anions and Nutrients (QCLot: 577395)										
FJ2201956-005	Travel Blank	Nitrate (as N)	14797-55-8	E235.NO3-L	2.09 mg/L	2.5 mg/L	83.6	75.0	125	----
Anions and Nutrients (QCLot: 577396)										
FJ2201956-005	Travel Blank	Sulfate (as SO4)	14808-79-8	E235.SO4	85.0 mg/L	100 mg/L	85.0	75.0	125	----
Anions and Nutrients (QCLot: 577397)										
FJ2201956-005	Travel Blank	Nitrite (as N)	14797-65-0	E235.NO2-L	0.424 mg/L	0.5 mg/L	84.9	75.0	125	----
Anions and Nutrients (QCLot: 577398)										
FJ2201956-005	Travel Blank	Fluoride	16984-48-8	E235.F	0.844 mg/L	1 mg/L	84.4	75.0	125	----
Anions and Nutrients (QCLot: 577399)										
FJ2201956-005	Travel Blank	Chloride	16887-00-6	E235.Cl	83.1 mg/L	100 mg/L	83.1	75.0	125	----
Anions and Nutrients (QCLot: 577534)										
CG2209725-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 577766)										
CG2209816-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 578760)										
CG2209739-012	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0670 mg/L	0.0676 mg/L	99.1	70.0	130	----
Anions and Nutrients (QCLot: 578761)										
FJ2201956-003	D1-Shallow	Phosphorus, total	7723-14-0	E372-U	0.0653 mg/L	0.0676 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 579493)										
FC2201686-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0674 mg/L	0.0676 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 579612)										
EO2205776-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.97 mg/L	10 mg/L	99.7	75.0	125	----
Organic / Inorganic Carbon (QCLot: 577245)										
CG2209746-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.06 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 577246)										
CG2209746-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	4.72 mg/L	5 mg/L	94.3	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: 581382)										
CG2209963-001	Anonymous	Calcium, dissolved	7440-70-2	E421	38.9 mg/L	40 mg/L	97.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	9.60 mg/L	10 mg/L	96.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-July-MON8/9- Day 1

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Canada Toll Free: 1 800 668 9878

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Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES ☑ NO
	Copy of Invoice with Report YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate, colour-true	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1-Shallow	25-Jul-22	08:10	Water		R	R	R	R	R			
	W1-Deep	25-Jul-22	07:35	Water		R	R	R	R	R			
	D1-Shallow	25-Jul-22	10:20	Water		R	R	R	R	R			
	D1-Deep	25-Jul-22	10:45	Water		R	R	R	R	R			
	Travel Blank			Water		R	R		R	R			

Fort St. John
Work Order Reference
FJ2201956

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
12.6							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Dennis Finnell		

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	7-25-22	11:41

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201684**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 12:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 28-Jun-2022
C-O-C number	: 2022-June-MON8/9-Day 1	Issue Date	: 12-Aug-2022 17:43
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Amber Montgomery	Account Manager Assistant	Administration, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Metals, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta

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 Unit
%	percent
µg/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
L	litres
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
<W	*No Measurable Response (Zero): < Reported Value.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
					Client sampling date / time	27-Jun-2022 08:45	27-Jun-2022 07:30	27-Jun-2022 10:45	27-Jun-2022 10:20	27-Jun-2022
						FJ2201684-001	FJ2201684-002	FJ2201684-003	FJ2201684-004	FJ2201684-005
						Result	Result	Result	Result	Result
Sample Preparation										
volume filtered	----	EF870B	0.001	L		0.070	0.070	0.070	0.070	0.070
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		90.5	85.1	111	98.7	<1.0
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		90.5	85.1	111	98.7	<1.0
colour, true	----	E329	5.0	CU		5.3	6.2	11.0	11.0	<5.0
conductivity	----	E100	2.0	µS/cm		182	181	185	182	<2.0
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		93.4	92.2	93.7	94.1	<0.50
pH	----	E108	0.10	pH units		8.03	8.04	7.99	7.99	5.63
solids, total dissolved [TDS]	----	E162	10	mg/L		114	112	121	125	<10
solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	<3.0	3.2	5.2	<3.0
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.031	0.027	0.034	0.031	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.078	0.070	0.193	0.126	<0.050
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0636	0.0666	0.0397	0.0590	<0.0050
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0010	<0.0010	<0.0010	<0.0010	<0.0010
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.143	0.137	0.233	0.185	<0.050
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	0.0022	<0.0010	<0.0010	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0044	0.0033	0.0161	0.0153	<0.0020
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	<0.0020	0.0024	<0.0020	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.63	4.65	4.69	4.70	<0.50
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		13.3	13.2	13.8	12.9	<0.30
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.70	2.59	4.01	4.04	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.66	2.72	4.11	3.99	<0.50 <W
Ion Balance										

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
					Client sampling date / time	27-Jun-2022 08:45	27-Jun-2022 07:30	27-Jun-2022 10:45	27-Jun-2022 10:20	27-Jun-2022
						FJ2201684-001	FJ2201684-002	FJ2201684-003	FJ2201684-004	FJ2201684-005
						Result	Result	Result	Result	Result
Ion Balance										
anion sum	----	EC101	0.10	meq/L		2.09	1.98	2.51	2.25	<0.10
cation sum	----	EC101	0.10	meq/L		1.93	1.90	1.95	1.95	<0.10
ion balance (APHA)	----	EC101	0.010	%		3.98	2.06	12.6	7.14	<0.010
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		26.4	26.3	26.5	26.5	<0.050
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.68	6.44	6.69	6.79	<0.0050
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.483	0.467	0.522	0.509	<0.050
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1.19	1.16	1.39	1.31	<0.050
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Plant Pigments										
chlorophyll a	479-61-8	EC870B	0.010	µg/L		1.02	1.47	2.77	0.974	<0.028
chlorophyll a	479-61-8	E870B	0.0020	µg/sample		0.0711	0.103	0.194	0.0682	<0.0020

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201684**	Page	: 1 of 22
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 12:16
PO	: 1200-25.03.02	Issue Date	: 12-Aug-2022 17:42
C-O-C number	: 2022-June-MON8/9-Day 1		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-DEEP	E298	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-SHALLOW	E298	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-DEEP	E298	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-SHALLOW	E298	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TRAVEL BLANK	E298	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-DEEP	E235.Cl	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-SHALLOW	E235.Cl	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE W1-DEEP	E235.Cl	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-SHALLOW	E235.Cl	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TRAVEL BLANK	E235.Cl	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-DEEP	E378-U	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-SHALLOW	E378-U	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE TRAVEL BLANK	E378-U	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-DEEP	E378-U	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-SHALLOW	E378-U	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-DEEP	E235.F	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-SHALLOW	E235.F	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-DEEP	E235.F	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-SHALLOW	E235.F	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE TRAVEL BLANK	E235.F	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO3-L	27-Jun-2022	29-Jun-2022	3 days	2 days	✓	29-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO3-L	27-Jun-2022	29-Jun-2022	3 days	2 days	✓	29-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO3-L	27-Jun-2022	29-Jun-2022	3 days	2 days	✓	29-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO3-L	27-Jun-2022	29-Jun-2022	3 days	2 days	✓	29-Jun-2022	3 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE TRAVEL BLANK	E235.NO3-L	27-Jun-2022	29-Jun-2022	3 days	3 days	✓	29-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO2-L	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO2-L	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO2-L	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO2-L	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE TRAVEL BLANK	E235.NO2-L	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-DEEP	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-SHALLOW	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-DEEP	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE W1-SHALLOW	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE TRAVEL BLANK	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	9 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-DEEP	E235.SO4	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-SHALLOW	E235.SO4	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-DEEP	E235.SO4	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-SHALLOW	E235.SO4	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TRAVEL BLANK	E235.SO4	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-DEEP	E375-T	27-Jun-2022	02-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-SHALLOW	E375-T	27-Jun-2022	02-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
W1-DEEP	E375-T	27-Jun-2022	02-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
W1-SHALLOW	E375-T	27-Jun-2022	02-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
D1-DEEP	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
D1-SHALLOW	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
TRAVEL BLANK	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
W1-DEEP	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
W1-SHALLOW	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-DEEP	E372-U	27-Jun-2022	28-Jun-2022	----	----		03-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-SHALLOW	E372-U	27-Jun-2022	28-Jun-2022	----	----		03-Jul-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-DEEP	E372-U	27-Jun-2022	28-Jun-2022	----	----		03-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-SHALLOW	E372-U	27-Jun-2022	28-Jun-2022	----	----		03-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
TRAVEL BLANK	E372-U	27-Jun-2022	28-Jun-2022	----	----		03-Jul-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-DEEP	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-SHALLOW	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
TRAVEL BLANK	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-DEEP	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-SHALLOW	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
D1-DEEP	E358-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-SHALLOW	E358-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-DEEP	E358-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-SHALLOW	E358-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-DEEP	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-SHALLOW	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-DEEP	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-SHALLOW	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) TRAVEL BLANK	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	17 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-DEEP	E290	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	14 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE D1-SHALLOW	E290	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TRAVEL BLANK	E290	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-DEEP	E290	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-SHALLOW	E290	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-DEEP	E329	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-SHALLOW	E329	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE TRAVEL BLANK	E329	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-DEEP	E329	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-SHALLOW	E329	27-Jun-2022	28-Jun-2022	----	----		28-Jun-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE D1-DEEP	E100	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-SHALLOW	E100	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE TRAVEL BLANK	E100	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-DEEP	E100	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-SHALLOW	E100	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE D1-DEEP	E108	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-SHALLOW	E108	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TRAVEL BLANK	E108	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-DEEP	E108	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 W1-SHALLOW	E108	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-DEEP	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-SHALLOW	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE TRAVEL BLANK	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-DEEP	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-SHALLOW	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-DEEP	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-SHALLOW	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-DEEP	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE W1-SHALLOW	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE TRAVEL BLANK	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 days	5 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-DEEP	E870B	27-Jun-2022	30-Jun-2022	28 days	3 days	✓	30-Jun-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-SHALLOW	E870B	27-Jun-2022	30-Jun-2022	28 days	3 days	✓	30-Jun-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE TRAVEL BLANK	E870B	27-Jun-2022	30-Jun-2022	28 days	3 days	✓	30-Jun-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-DEEP	E870B	27-Jun-2022	30-Jun-2022	28 days	3 days	✓	30-Jun-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-SHALLOW	E870B	27-Jun-2022	30-Jun-2022	28 days	3 days	✓	30-Jun-2022	28 days	0 days	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-SHALLOW	EF870B	27-Jun-2022	----	----	----		28-Jun-2022	48 hrs	26 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-DEEP	EF870B	27-Jun-2022	----	----	----		28-Jun-2022	48 hrs	27 hrs	✓

Matrix: **Water**

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

Analyte Group / 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
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
W1-SHALLOW	EF870B	27-Jun-2022	----	----	----		28-Jun-2022	48 hrs	28 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
W1-DEEP	EF870B	27-Jun-2022	----	----	----		28-Jun-2022	48 hrs	29 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
TRAVEL BLANK	EF870B	27-Jun-2022	----	----	----		28-Jun-2022	48 hrs	37 hrs	✓

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	543169	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	541967	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	543269	1	13	7.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	544612	1	5	20.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	541302	1	5	20.0	5.0	✓
Conductivity in Water	E100	543168	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	541300	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	543273	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	543271	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	543272	1	11	9.0	5.0	✓
pH by Meter	E108	543167	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	543270	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546648	2	22	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	541630	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	543169	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	541967	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	543269	1	13	7.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	544612	1	5	20.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	541302	1	5	20.0	5.0	✓
Conductivity in Water	E100	543168	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	541300	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	543273	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	543271	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	543272	1	11	9.0	5.0	✓
pH by Meter	E108	543167	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	543270	1	11	9.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546648	2	22	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	541630	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	543169	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	541967	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	543269	1	13	7.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	544612	1	5	20.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	541302	1	5	20.0	5.0	✓
Conductivity in Water	E100	543168	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	541300	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	543273	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	543271	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	543272	1	11	9.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	543270	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546648	2	22	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	541630	1	17	5.8	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	541967	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	543269	1	13	7.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	541300	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	543273	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	543271	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	543272	1	11	9.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	543270	1	11	9.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546648	2	22	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	541630	1	17	5.8	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B Vancouver - Environmental	Water	CALC	Convert results to sample concentration based on support lab filter information.
Chlorophyll-a Filtration by Support Laboratory	EF870B Calgary - Environmental	Water	EPA 445.0 (mod)	Filtration for chlorophyll-a analysis

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

QUALITY CONTROL REPORT

Work Order	: **FJ2201684**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 12:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 28-Jun-2022
C-O-C number	: 2022-June-MON8/9-Day 1	Issue Date	: 12-Aug-2022 17:44
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Amber Montgomery	Account Manager Assistant	Calgary Administration, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Calgary Metals, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta

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: 541302)											
FJ2201684-001	W1-SHALLOW	colour, true	----	E329	5.0	CU	5.3	6.2	0.9	Diff <2x LOR	----
Physical Tests (QC Lot: 543167)											
CG2208221-008	Anonymous	pH	----	E108	0.10	pH units	8.16	8.20	0.489%	4%	----
Physical Tests (QC Lot: 543168)											
CG2208221-008	Anonymous	conductivity	----	E100	2.0	µS/cm	1920	1930	0.466%	10%	----
Physical Tests (QC Lot: 543169)											
CG2208221-008	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	468	463	1.14%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	468	463	1.14%	20%	----
Physical Tests (QC Lot: 545518)											
CG2208452-004	Anonymous	solids, total dissolved [TDS]	----	E162	10	mg/L	<10	<10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 546209)											
CG2208198-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	6.8	7.0	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 541300)											
CG2208225-008	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0770	0.0766	0.520%	20%	----
Anions and Nutrients (QC Lot: 541630)											
CG2208225-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.177	0.172	0.0052	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 541967)											
FC2201381-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.250	mg/L	8.25	8.40	1.84%	20%	----
Anions and Nutrients (QC Lot: 543269)											
CG2208326-001	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	3.99	4.16	0.17	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 543270)											
CG2208326-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	308	312	1.36%	20%	----
Anions and Nutrients (QC Lot: 543271)											
CG2208326-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.287	0.301	4.66%	20%	----
Anions and Nutrients (QC Lot: 543272)											
CG2208326-001	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: 543273)											
CG2208326-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.139	0.140	0.001	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*
Anions and Nutrients (QC Lot: 546648)											
CG2208169-015	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546649)											
FJ2201684-004	D1-DEEP	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	0.0020	0.00005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 547026)											
EO2204853-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.100	mg/L	1.27	1.27	0.299%	20%	----
Anions and Nutrients (QC Lot: 550319)											
EO2204853-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	10.7	10.7	0.599%	20%	----
Organic / Inorganic Carbon (QC Lot: 553661)											
CG2208134-014	Anonymous	carbon, total organic [TOC]	----	E355-L	50.0	mg/L	1950	1940	0.566%	20%	----
Organic / Inorganic Carbon (QC Lot: 553662)											
EO2204853-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.82	4.47	0.65	Diff <2x LOR	----
Dissolved Metals (QC Lot: 549260)											
CG2208183-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.500	mg/L	34.2	33.8	1.13%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	41.1	41.3	0.374%	20%	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	76.6	77.5	1.27%	20%	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	55.5	56.4	1.61%	20%	----
Plant Pigments (QC Lot: 544612)											
FJ2201684-001	W1-SHALLOW	chlorophyll a	479-61-8	E870B	0.0020	µg/sample	0.0711	0.0777	8.89%	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: 541302)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 543168)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 543169)						
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: 545518)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 546209)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 541300)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 541630)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 541967)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 543269)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 543270)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 543271)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 543272)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 543273)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 546648)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 546649)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 547026)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 550319)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 553661)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 553662)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 549260)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Plant Pigments (QCLot: 544612)						
chlorophyll a	479-61-8	E870B	0.002	µg/sample	<0.0020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 541302)									
colour, true	----	E329	5	CU	100 CU	98.0	85.0	115	----
Physical Tests (QCLot: 543167)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 543168)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 543169)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	102	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 545518)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	89.6	85.0	115	----
Physical Tests (QCLot: 546209)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 541300)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 541630)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	92.7	80.0	120	----
Anions and Nutrients (QCLot: 541967)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 543269)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 543270)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 543271)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 543272)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 543273)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 546648)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	99.4	80.0	120	----
Anions and Nutrients (QCLot: 546649)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 547026)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 550319)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 553661)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	95.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 553662)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.2	80.0	120	----
Dissolved Metals (QCLot: 549260)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
Plant Pigments (QCLot: 544612)									
chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	91.8	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: 541300)										
CG2208225-009	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0475 mg/L	0.05 mg/L	94.9	70.0	130	----
Anions and Nutrients (QCLot: 541630)										
CG2208225-006	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 541967)										
FC2201384-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 543269)										
CG2208326-001	Anonymous	chloride	16887-00-6	E235.Cl	91.9 mg/L	100 mg/L	91.9	75.0	125	----
Anions and Nutrients (QCLot: 543270)										
CG2208326-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 543271)										
CG2208326-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.29 mg/L	2.5 mg/L	91.7	75.0	125	----
Anions and Nutrients (QCLot: 543272)										
CG2208326-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.462 mg/L	0.5 mg/L	92.5	75.0	125	----
Anions and Nutrients (QCLot: 543273)										
CG2208326-001	Anonymous	fluoride	16984-48-8	E235.F	0.954 mg/L	1 mg/L	95.4	75.0	125	----
Anions and Nutrients (QCLot: 546648)										
CG2208169-016	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0529 mg/L	0.0676 mg/L	78.2	70.0	130	----
Anions and Nutrients (QCLot: 546649)										
FJ2201688-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0634 mg/L	0.0676 mg/L	93.8	70.0	130	----
Anions and Nutrients (QCLot: 547026)										
EO2204854-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.53 mg/L	2.5 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 550319)										
EO2204854-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.28 mg/L	10 mg/L	92.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 553661)										
CG2208134-014	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 553662)										
EO2204853-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.96 mg/L	5 mg/L	119	70.0	130	----
Dissolved Metals (QCLot: 549260)										

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: 549260) - continued										
CG2208183-002	Anonymous	calcium, dissolved	7440-70-2	E421	35.6 mg/L	40 mg/L	89.0	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	9.12 mg/L	10 mg/L	91.2	70.0	130	----
		potassium, dissolved	7440-09-7	E421	39.0 mg/L	40 mg/L	97.5	70.0	130	----
		sodium, dissolved	7440-23-5	E421	18.9 mg/L	20 mg/L	94.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-June-MON8/9- Day 1

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

ALS Lab Work Order # (ALS use only):

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

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	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate, F/P	Chlorophyll-a by fluorometry F/P	DOC, Total dissolved P P	Hardness P	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	W1-Shallow	27-JUN-22	0845	Water	5	R	R	R	R	R	R			
	W1-Deep		0730	Water	5	R	R	R	R	R	R			
	D1-Shallow		10:45	Water	5	R	R	R	R	R	R			
	D1-Deep		10:20	Water	5	R	R	R	R	R	R			
	Travel Blank		—	Water	4	R	R		R	R	R			

Fort St. John
Work Order Reference
FJ2201684

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
3.0 C	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	June 27, 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	6-27-22	12:16

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201688**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 16:30
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jun-2022
C-O-C number	: 2022-June-MON8/9- Day 3	Issue Date	: 12-Aug-2022 17:57
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Dwayne Bennett	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Metals, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
SFT	*Sample was filtered due to turbidity interference. Result reflects soluble analyte concentration.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	MD	----	----	----	----
					Client sampling date / time	27-Jun-2022 15:40	----	----	----	----
					FJ2201688-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		112	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		112	----	----	----	----
conductivity	----	E100	2.0	µS/cm		186	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		99.8	----	----	----	----
pH	----	E108	0.10	pH units		8.04	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		226	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		915	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0191	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.056	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		1.52	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0241	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0010	----	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		1.54	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0018	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		1.02	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0080	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		3.46 SFT	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		8.26	----	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		8.82	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		8.87	----	----	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L		2.41	----	----	----	----
cation sum	----	EC101	0.10	meq/L		2.10	----	----	----	----
ion balance (APHA)	----	EC101	0.010	%		6.87	----	----	----	----

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)					Client sample ID	**MD**	**----**	**----**	**----**	**----**
					Client sampling date / time	27-Jun-2022 15:40	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		**FJ2201688-001**	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		26.5	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		8.17	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.857	----	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1.80	----	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201688**	Page	: 1 of 10
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 16:30
PO	: 1200-25.03.02	Issue Date	: 12-Aug-2022 17:57
C-O-C number	: 2022-June-MON8/9- Day 3		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MD	E298	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MD	E235.Cl	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE										
MD	E378-U	27-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MD	E235.F	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
MD	E235.NO3-L	27-Jun-2022	30-Jun-2022	3 days	3 days	✓	30-Jun-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
MD	E235.NO2-L	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
MD	E392	27-Jun-2022	----	----	----		05-Jul-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MD	E235.SO4	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
MD	E375-T	27-Jun-2022	02-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MD	E318	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
MD	E372-U	27-Jun-2022	02-Jul-2022	----	----		04-Jul-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
MD	E421	27-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MD	E358-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MD	E355-L	27-Jun-2022	07-Jul-2022	----	----		13-Jul-2022	28 days	16 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MD	E290	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE										
MD	E100	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 MD	E108	27-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE MD	E162	27-Jun-2022	----	----	----		02-Jul-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD	E160	27-Jun-2022	----	----	----		01-Jul-2022	7 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	544848	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	544643	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	544792	1	3	33.3	5.0	✓
Conductivity in Water	E100	544849	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544786	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544789	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544790	1	6	16.6	5.0	✓
pH by Meter	E108	544847	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544791	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546649	1	2	50.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	546451	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	544848	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	544643	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	544792	1	3	33.3	5.0	✓
Conductivity in Water	E100	544849	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544786	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544789	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544790	1	6	16.6	5.0	✓
pH by Meter	E108	544847	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544791	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546649	1	2	50.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	546451	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	544848	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	544643	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	544792	1	3	33.3	5.0	✓
Conductivity in Water	E100	544849	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544786	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544789	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544790	1	6	16.6	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544791	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	545518	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546649	1	2	50.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	546451	1	11	9.0	5.0	✓
TSS by Gravimetry	E160	546209	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	544643	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	544792	1	3	33.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549260	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	553662	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544786	1	6	16.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544789	1	6	16.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544790	1	6	16.6	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544791	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	546649	1	2	50.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	547026	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	553661	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	546451	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	“Hardness (as $CaCO_3$), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2201688**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jun-2022 16:30
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jun-2022
C-O-C number	: 2022-June-MON8/9- Day 3	Issue Date	: 12-Aug-2022 17:57
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Dwayne Bennett	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Calgary Metals, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta

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: 544847)											
CG2208394-001	Anonymous	pH	----	E108	0.10	pH units	7.74	7.73	0.129%	4%	----
Physical Tests (QC Lot: 544848)											
CG2208394-001	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	476	478	0.587%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	476	478	0.587%	20%	----
Physical Tests (QC Lot: 544849)											
CG2208395-001	Anonymous	conductivity	----	E100	2.0	µS/cm	21.3	20.4	0.9	Diff <2x LOR	----
Physical Tests (QC Lot: 545518)											
CG2208452-004	Anonymous	solids, total dissolved [TDS]	----	E162	10	mg/L	<10	<10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 546209)											
CG2208198-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	6.8	7.0	0.2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 543858)											
CG2208390-004	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544643)											
CG2208340-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0436	0.0423	0.0013	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544786)											
CG2208163-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.132	0.130	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544789)											
CG2208163-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	1.04	1.04	0.616%	20%	----
Anions and Nutrients (QC Lot: 544790)											
CG2208163-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0018	0.0018	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544791)											
CG2208163-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	235	234	0.389%	20%	----
Anions and Nutrients (QC Lot: 544792)											
CG2208435-001	Anonymous	chloride	16887-00-6	E235.Cl	10.0	mg/L	1660	1710	2.61%	20%	----
Anions and Nutrients (QC Lot: 546451)											
CG2208452-003	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0845	0.0838	0.869%	20%	----
Anions and Nutrients (QC Lot: 546649)											
FJ2201684-004	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	0.0020	0.00005	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*
Anions and Nutrients (QC Lot: 547026)											
EO2204853-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.100	mg/L	1.27	1.27	0.299%	20%	----
Anions and Nutrients (QC Lot: 550319)											
EO2204853-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	10.7	10.7	0.599%	20%	----
Organic / Inorganic Carbon (QC Lot: 553661)											
CG2208134-014	Anonymous	carbon, total organic [TOC]	----	E355-L	50.0	mg/L	1950	1940	0.566%	20%	----
Organic / Inorganic Carbon (QC Lot: 553662)											
EO2204853-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.82	4.47	0.65	Diff <2x LOR	----
Dissolved Metals (QC Lot: 549260)											
CG2208183-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.500	mg/L	34.2	33.8	1.13%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	41.1	41.3	0.374%	20%	----
		potassium, dissolved	7440-09-7	E421	0.500	mg/L	76.6	77.5	1.27%	20%	----
		sodium, dissolved	7440-23-5	E421	0.500	mg/L	55.5	56.4	1.61%	20%	----

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: 544848)						
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: 544849)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 545518)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 546209)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 543858)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 544643)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 544786)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 544789)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 544790)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 544791)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 544792)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 546451)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 546649)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 547026)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 550319)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 553661)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 553662)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 549260)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<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: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 544847)									
pH	----	E108	----	pH units	7 pH units	99.8	98.6	101	----
Physical Tests (QCLot: 544848)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	108	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Physical Tests (QCLot: 544849)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.3	90.0	110	----
Physical Tests (QCLot: 545518)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	89.6	85.0	115	----
Physical Tests (QCLot: 546209)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 543858)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 544643)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 544786)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 544789)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 544790)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.2	90.0	110	----
Anions and Nutrients (QCLot: 544791)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 544792)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 546451)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	99.3	80.0	120	----
Anions and Nutrients (QCLot: 546649)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 547026)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 550319)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 553661)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	95.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 553662)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.2	80.0	120	----
Dissolved Metals (QCLot: 549260)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.3	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	108	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	106	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: 543858)										
CG2208390-005	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0498 mg/L	0.05 mg/L	99.6	70.0	130	----
Anions and Nutrients (QCLot: 544643)										
CG2208366-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0991 mg/L	0.1 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 544786)										
CG2208163-002	Anonymous	fluoride	16984-48-8	E235.F	0.996 mg/L	1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 544789)										
CG2208163-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.41 mg/L	2.5 mg/L	96.4	75.0	125	----
Anions and Nutrients (QCLot: 544790)										
CG2208163-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.515 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 544791)										
CG2208163-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 544792)										
CG2208435-002	Anonymous	chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 546451)										
CG2208452-004	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0542 mg/L	0.0676 mg/L	80.2	70.0	130	----
Anions and Nutrients (QCLot: 546649)										
FJ2201688-001	MD	phosphorus, total dissolved	7723-14-0	E375-T	0.0634 mg/L	0.0676 mg/L	93.8	70.0	130	----
Anions and Nutrients (QCLot: 547026)										
EO2204854-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.53 mg/L	2.5 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 550319)										
EO2204854-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.28 mg/L	10 mg/L	92.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 553661)										
CG2208134-014	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 553662)										
EO2204853-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.96 mg/L	5 mg/L	119	70.0	130	----
Dissolved Metals (QCLot: 549260)										
CG2208183-002	Anonymous	calcium, dissolved	7440-70-2	E421	35.6 mg/L	40 mg/L	89.0	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	9.12 mg/L	10 mg/L	91.2	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: 549260) - continued										
CG2208183-002	Anonymous	potassium, dissolved	7440-09-7	E421	39.0 mg/L	40 mg/L	97.5	70.0	130	----
		sodium, dissolved	7440-23-5	E421	18.9 mg/L	20 mg/L	94.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	BEAS MD	27-JUN-22	15:40	Water	4	R	R	R	R	R			
				Water	4	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2201688

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
23c	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	June 27, 2022	4:25

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	6-27-22	4:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201698**	Page	: 1 of 5
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jun-2022 14:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jun-2022
C-O-C number	: 2022-June-MON8/9-DAY 2	Issue Date	: 06-Jun-2023 14:36
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta

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
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	CG Calgary - Environmental	2559 29th Street NE, Calgary, Alberta
B	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR1	PR2	HD-A	HD-B	PR3
						Client sampling date / time	28-Jun-2022 07:45	28-Jun-2022 12:05	28-Jun-2022 12:40	28-Jun-2022 12:40	28-Jun-2022 10:35
							FJ2201698-001	FJ2201698-002	FJ2201698-003	FJ2201698-004	FJ2201698-005
							Result	Result	Result	Result	Result
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		92.6	89.8	148	151	97.7
Alkalinity, carbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	3.6	3.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, phenolphthalein (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	1.8	1.5	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	A	1.0	mg/L		92.6	89.8	152	154	97.7
Conductivity	----	E100/CG	A	2.0	µS/cm		190	194	320	322	215
Hardness (as CaCO3), dissolved	----	EC100/CG		0.50	mg/L		94.8	96.9	169	168	108
pH	----	E108/CG	A	0.10	pH units		8.10	8.11	8.33	8.32	8.16
Solids, total dissolved [TDS]	----	E162/CG	A	10	mg/L		127	137	243	244	164
Solids, total suspended [TSS]	----	E160/CG	A	3.0	mg/L		5.9	17.1	148	147	121
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/CG	A	0.0050	mg/L		0.0094	0.0070	0.0076	0.0233	0.0051
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L		0.032	0.033	0.064	0.062	0.039
Kjeldahl nitrogen, total [TKN]	----	E318/CG	A	0.050	mg/L		0.155	0.157	0.498	0.455	0.320
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	A	0.0050	mg/L		0.0732	0.0651	0.0166	0.0160	0.0609
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	A	0.0010	mg/L		0.0010	0.0012	0.0012	0.0010	<0.0010
Nitrogen, total	7727-37-9	EC368/CG		0.050	mg/L		0.229	0.223	0.516	0.472	0.381
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/CG	A	0.0010	mg/L		<0.0010	<0.0010	0.0025	0.0024	<0.0010
Phosphorus, total	7723-14-0	E372-U/CG	A	0.0020	mg/L		0.0132	0.0283	0.199 DLHC	0.193 DLHC	0.136 DLHC
Phosphorus, total dissolved	7723-14-0	E375-T/CG	A	0.0020	mg/L		0.0029	0.0029	0.0069	0.0068	0.0046
Silicate (as SiO2)	7631-86-9	E392/VA	B	0.50	mg/L		4.68	4.73	3.71	3.71	4.53
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L		12.8	13.4	29.2	29.1	15.8
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/CG	A	0.50	mg/L		3.22	3.34	5.17	5.29	3.63
Carbon, total organic [TOC]	----	E355-L/CG	A	0.50	mg/L		2.96	3.62	6.67	6.75	3.73
Ion Balance											
Anion sum	----	EC101/CG		0.10	meq/L		2.12	2.08	3.65	3.69	2.29

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR1	PR2	HD-A	HD-B	PR3
					Client sampling date / time	28-Jun-2022 07:45	28-Jun-2022 12:05	28-Jun-2022 12:40	28-Jun-2022 12:40	28-Jun-2022 10:35
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2201698-001	FJ2201698-002	FJ2201698-003	FJ2201698-004	FJ2201698-005
						Result	Result	Result	Result	Result
Ion Balance										
Cation sum	----	EC101/CG		0.10	meq/L	1.96	2.01	3.49	3.46	2.25
Ion balance (APHA)	----	EC101/CG		0.010	%	3.92	1.71	2.24	3.22	0.881
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L	27.0	27.4	45.6	45.6	30.3
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L	6.66	6.92	13.5	13.2	7.98
Phosphorus, dissolved	7723-14-0	E421/CG	A	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Sodium, dissolved	7440-23-5	E421/CG	A	0.050	mg/L	1.25	1.41	1.96	1.92	1.48
Dissolved metals filtration location	----	EP421/CG		-	-	Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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	: **FJ2201698**	Page	: 1 of 18
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jun-2022 14:00
PO	: 1200-25.03.02	Issue Date	: 06-Jun-2023 14:36
C-O-C number	: 2022-June-MON8/9-DAY 2		
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD-A	E298	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD-B	E298	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR1	E298	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2	E298	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR3	E298	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD-A	E235.Cl	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD-B	E235.Cl	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PR1	E235.Cl	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2	E235.Cl	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR3	E235.Cl	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD-A	E378-U	28-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD-B	E378-U	28-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1	E378-U	28-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2	E378-U	28-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3	E378-U	28-Jun-2022	29-Jun-2022	----	----		29-Jun-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD-A	E235.F	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD-B	E235.F	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1	E235.F	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2	E235.F	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3	E235.F	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD-A	E235.NO3-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD-B	E235.NO3-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1	E235.NO3-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2	E235.NO3-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR3	E235.NO3-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD-A	E235.NO2-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD-B	E235.NO2-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1	E235.NO2-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2	E235.NO2-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3	E235.NO2-L	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD-A	E392	28-Jun-2022	----	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD-B	E392	28-Jun-2022	----	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR1	E392	28-Jun-2022	----	----	----		05-Jul-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PR2	E392	28-Jun-2022	----	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR3	E392	28-Jun-2022	----	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD-A	E235.SO4	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD-B	E235.SO4	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1	E235.SO4	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2	E235.SO4	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3	E235.SO4	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD-A	E375-T	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD-B	E375-T	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1	E375-T	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2	E375-T	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3	E375-T	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD-A	E318	28-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD-B	E318	28-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR1	E318	28-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR2	E318	28-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR3	E318	28-Jun-2022	06-Jul-2022	----	----		06-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD-A	E372-U	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD-B	E372-U	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1	E372-U	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2	E372-U	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3	E372-U	28-Jun-2022	04-Jul-2022	----	----		05-Jul-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD-A	E421	28-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD-B	E421	28-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR1	E421	28-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR2	E421	28-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR3	E421	28-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD-A	E358-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD-B	E358-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1	E358-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2	E358-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3	E358-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD-A	E355-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD-B	E355-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1	E355-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2	E355-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3	E355-L	28-Jun-2022	05-Jul-2022	----	----		10-Jul-2022	28 days	12 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD-A	E290	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD-B	E290	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1	E290	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2	E290	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3	E290	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE HD-A	E100	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE HD-B	E100	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1	E100	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PR2	E100	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3	E100	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE HD-A	E108	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE HD-B	E108	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1	E108	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2	E108	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3	E108	28-Jun-2022	30-Jun-2022	----	----		30-Jun-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD-A	E162	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE HD-B	E162	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 PR1	E162	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR2	E162	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR3	E162	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD-A	E160	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD-B	E160	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1	E160	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2	E160	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3	E160	28-Jun-2022	----	----	----		04-Jul-2022	7 days	6 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	544262	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	544921	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	544861	1	5	20.0	5.0	✓
Conductivity in Water	E100	544264	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549844	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	550291	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544855	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544859	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544860	1	20	5.0	5.0	✓
pH by Meter	E108	544263	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544856	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	546501	2	22	9.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	548175	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	550051	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	550292	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	548165	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	546504	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	544262	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	544921	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	544861	1	5	20.0	5.0	✓
Conductivity in Water	E100	544264	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549844	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	550291	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544855	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544859	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544860	1	20	5.0	5.0	✓
pH by Meter	E108	544263	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544856	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	546501	2	22	9.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	548175	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	550051	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	550292	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	548165	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	546504	1	18	5.5	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	544262	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	544921	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	544861	1	5	20.0	5.0	✓
Conductivity in Water	E100	544264	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549844	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	550291	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544855	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544859	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544860	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544856	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	546501	2	22	9.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	548175	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	550051	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	550292	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	548165	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	546504	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	544921	1	17	5.8	5.0	✓
Chloride in Water by IC	E235.Cl	544861	1	5	20.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549844	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	550291	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	543858	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	544855	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	544859	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	544860	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	544856	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	548175	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	550051	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	550292	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	548165	1	16	6.2	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	“Hardness (as $CaCO_3$), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2201698**	Page	: 1 of 10
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jun-2022 14:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jun-2022
C-O-C number	: 2022-June-MON8/9-DAY 2	Issue Date	: 06-Jun-2023 14:36
Sampler	: PAT BEAUPRE 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta

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: 544262)											
CG2208338-008	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	144	145	0.277%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	4.8	5.0	0.2	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	2.4	2.5	0.1	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	149	150	0.401%	20%	----
Physical Tests (QC Lot: 544263)											
CG2208338-008	Anonymous	pH	----	E108	0.10	pH units	8.43	8.46	0.355%	4%	----
Physical Tests (QC Lot: 544264)											
CG2208338-008	Anonymous	Conductivity	----	E100	2.0	µS/cm	549	551	0.364%	10%	----
Physical Tests (QC Lot: 546501)											
CG2208346-006	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	266	263	1.32%	20%	----
Physical Tests (QC Lot: 546502)											
FJ2201698-004	HD-B	Solids, total dissolved [TDS]	----	E162	20	mg/L	244	238	2.28%	20%	----
Physical Tests (QC Lot: 546504)											
FJ2201693-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	10.9	10.1	0.8	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 543858)											
CG2208390-004	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544855)											
CG2208387-013	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.200	0.194	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544856)											
CG2208387-013	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	822	824	0.150%	20%	----
Anions and Nutrients (QC Lot: 544859)											
CG2208387-013	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.266	0.285	7.04%	20%	----
Anions and Nutrients (QC Lot: 544860)											
CG2208387-013	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: 544861)											
FJ2201698-001	PR1	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 544921)											
CG2208400-007	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	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*
Anions and Nutrients (QC Lot: 548165)											
CG2208540-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0154	0.0131	0.0022	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 548175)											
CG2208369-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0352	0.0377	7.10%	20%	----
Anions and Nutrients (QC Lot: 550051)											
CG2208303-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	10.0	mg/L	57.2	59.7	2.52	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 550319)											
EO2204853-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	10.7	10.7	0.599%	20%	----
Organic / Inorganic Carbon (QC Lot: 550291)											
CG2208310-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.65	0.65	0.006	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 550292)											
CG2208310-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.59	0.76	0.17	Diff <2x LOR	----
Dissolved Metals (QC Lot: 549844)											
CG2208240-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	68.1	67.4	1.02%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	21.7	20.6	5.49%	20%	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	5.51	5.28	4.21%	20%	----

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: 544262)						
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: 544264)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 546501)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 546502)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 546504)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 543858)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 544855)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 544856)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 544859)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 544860)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 544861)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 544921)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 548165)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 548175)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 550051)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 550051) - continued						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 550319)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 550291)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 550292)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 549844)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<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: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 544262)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	96.6	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 544263)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 544264)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 546501)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.7	85.0	115	----
Physical Tests (QCLot: 546502)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.0	85.0	115	----
Physical Tests (QCLot: 546504)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 543858)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 544855)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 544856)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 544859)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 544860)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 544861)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.9	90.0	110	----
Anions and Nutrients (QCLot: 544921)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.2	85.0	115	----
Anions and Nutrients (QCLot: 548165)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 548175)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 550051)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 550051) - continued									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 550319)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 550291)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	89.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 550292)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	90.1	80.0	120	----
Dissolved Metals (QCLot: 549844)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.5	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.0	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	98.5	70.0	130	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.8	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: 543858)										
CG2208390-005	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0498 mg/L	0.05 mg/L	99.6	70.0	130	----
Anions and Nutrients (QCLot: 544855)										
CG2208387-014	Anonymous	Fluoride	16984-48-8	E235.F	0.781 mg/L	1 mg/L	78.1	75.0	125	----
Anions and Nutrients (QCLot: 544856)										
CG2208387-014	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	77.9 mg/L	100 mg/L	77.9	75.0	125	----
Anions and Nutrients (QCLot: 544859)										
CG2208387-014	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	1.96 mg/L	2.5 mg/L	78.4	75.0	125	----
Anions and Nutrients (QCLot: 544860)										
CG2208387-014	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.399 mg/L	0.5 mg/L	79.8	75.0	125	----
Anions and Nutrients (QCLot: 544861)										
FJ2201698-002	PR2	Chloride	16887-00-6	E235.Cl	91.9 mg/L	100 mg/L	91.9	75.0	125	----
Anions and Nutrients (QCLot: 544921)										
CG2208400-008	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0997 mg/L	0.1 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 548165)										
CG2208540-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0651 mg/L	0.0676 mg/L	96.3	70.0	130	----
Anions and Nutrients (QCLot: 548175)										
CG2208369-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0690 mg/L	0.0676 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 550051)										
CG2208370-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.62 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 550319)										
EO2204854-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.28 mg/L	10 mg/L	92.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 550291)										
CG2208310-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.88 mg/L	5 mg/L	97.5	70.0	130	----
Organic / Inorganic Carbon (QCLot: 550292)										
CG2208310-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.20 mg/L	5 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 549844)										
CG2208328-001	Anonymous	Calcium, dissolved	7440-70-2	E421	ND mg/L	40 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
Dissolved Metals (QCLot: 549844) - continued										
CG2208328-001	Anonymous	Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	95.4 mg/L	100 mg/L	95.4	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	16.2 mg/L	20 mg/L	80.9	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	500 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com
Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, pKg, Si, diss orthophosphate,	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
							F/P	P	P				
	PR1	28 JUN 22	0745	Water	4	R	R	R	R	R			
	~~PR1~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	PR2	28 JUN 22	12:05	Water	4	R	R	R	R	R			
	HD-A	28 JUN 22	12:40	Water	4	R	R	R	R	R			
	HD-B	28 JUN 22	~~13:35~~ 12:40	Water	4	R	R	R	R	R			
	~~PR3~~ PR3	28 JUN 22	10:35	Water	5	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2201698

Telephone : +1 250 261 5517

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	****Low level Hg for total and dissolved. Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
9.8							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: June 28, 2022	Time:	Received by: RICIE	Date: 6.28.22	Time: 2:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201733**	Page	: 1 of 6
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 29-Jun-2022 15:25
PO	: 1200-25.03.02	Date Analysis Commenced	: 02-Jul-2022
C-O-C number	: 2022-June-Mon8/9-Day 3	Issue Date	: 25-Jul-2022 19:50
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 10		
No. of samples analysed	: 10		

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*
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	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*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA-A	BEA-B	PD2	PD2-FB	PINE
					Client sampling date / time	29-Jun-2022 09:35	29-Jun-2022 09:45	29-Jun-2022 09:10	29-Jun-2022 08:40	29-Jun-2022 08:15
						FJ2201733-001	FJ2201733-002	FJ2201733-003	FJ2201733-004	FJ2201733-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		31.5	31.3	111	<1.0	99.1
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		31.5	31.3	111	<1.0	99.1
conductivity	----	E100	2.0	µS/cm		114	115	227	<2.0	190
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		51.9	51.6	111	<0.60	97.8
pH	----	E108	0.10	pH units		7.38	7.37	8.10	5.25	8.08
solids, total dissolved [TDS]	----	E162	10	mg/L		210	216	170	<10	127
solids, total suspended [TSS]	----	E160	3.0	mg/L		276	304	121	<3.0	118
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0378	0.0278	0.0164	<0.0050	0.0060
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.070	0.071	0.060	<0.020	0.045
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		1.31 RRV	1.26 RRV	0.339	<0.050	0.282
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		<0.0050	<0.0050	0.0461	<0.0050	0.0470
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
nitrogen, total	7727-37-9	E366	0.030	mg/L		0.989 RRV	0.880 RRV	0.272	<0.030	0.203
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0070	0.0071	0.0031	<0.0010	0.0032
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.377	0.380	0.188	<0.0020	0.139
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0185	0.0192	0.0053	<0.0020	0.0050
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.82	4.81	3.70	<0.50	2.48
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		22.0	22.0	17.1	<0.30	7.87
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		32.0	34.8	5.01	<0.50	3.46
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		41.3	42.1	7.49	<0.50	5.56
Ion Balance										
anion sum	----	EC101	0.10	meq/L		1.09	1.09	2.58	<0.10	2.15
cation sum	----	EC101	0.10	meq/L		1.29	1.29	2.30	<0.10	2.02
ion balance (APHA)	----	EC101	0.010	%		8.40	8.40	5.74	<0.010	3.12

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA-A	BEA-B	PD2	PD2-FB	PINE
					Client sampling date / time	29-Jun-2022 09:35	29-Jun-2022 09:45	29-Jun-2022 09:10	29-Jun-2022 08:40	29-Jun-2022 08:15
						FJ2201733-001	FJ2201733-002	FJ2201733-003	FJ2201733-004	FJ2201733-005
						Result	Result	Result	Result	Result
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		14.8	14.7	31.6	<0.050	28.4
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		3.64	3.63	7.79	<0.0050	6.53
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD1	POUCE	PD4	KR	PD3
					Client sampling date / time	29-Jun-2022 07:45	29-Jun-2022 12:30	29-Jun-2022 11:32	29-Jun-2022 10:50	29-Jun-2022 10:20
						FJ2201733-006	FJ2201733-007	FJ2201733-008	FJ2201733-009	FJ2201733-010
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		113	124	94.9	171	107
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		113	124	94.9	171	107
conductivity	----	E100	2.0	µS/cm		240	439	204	318	218
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		122	185	99.3	157	108
pH	----	E108	0.10	pH units		8.12	8.14	8.05	8.27	8.09
solids, total dissolved [TDS]	----	E162	10	mg/L		174	347	167	290	158
solids, total suspended [TSS]	----	E160	3.0	mg/L		128	40.8	170	170	144
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0140	0.0376	0.0108	0.0503	0.0110
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	4.26	<0.50	0.72	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.056	0.134	0.054	0.090	0.053
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.346 RRV	1.06	0.480 RRV	0.869 RRV	0.406
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0460	<0.0050	0.0399	0.0218	0.0449
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	0.0110	<0.0010
nitrogen, total	7727-37-9	E366	0.030	mg/L		0.255 RRV	1.01	0.327 RRV	0.656	0.267 RRV
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0036	0.0040	0.0046	0.0068	0.0039
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.168	0.222	0.197	0.223	0.185
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0052	0.0165	0.0071	0.0122	0.0070
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.29	2.44	3.56	4.79	3.40
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		20.6	99.1	15.4	12.8	14.8
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		5.02	25.1	7.52	15.3	8.67
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		7.66	27.8	11.5	20.5	8.20
Ion Balance										
anion sum	----	EC101	0.10	meq/L		2.69	4.67	2.22	3.71	2.45
cation sum	----	EC101	0.10	meq/L		2.52	4.58	2.08	3.44	2.24
ion balance (APHA)	----	EC101	0.010	%		3.26	0.973	3.26	3.78	4.48
Dissolved Metals										

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD1	POUCE	PD4	KR	PD3
					Client sampling date / time	29-Jun-2022 07:45	29-Jun-2022 12:30	29-Jun-2022 11:32	29-Jun-2022 10:50	29-Jun-2022 10:20
						FJ2201733-006	FJ2201733-007	FJ2201733-008	FJ2201733-009	FJ2201733-010
						Result	Result	Result	Result	Result
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		33.8	50.3	27.8	44.1	30.2
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		9.05	14.4	7.26	11.3	7.83
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201733**	Page	: 1 of 31
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 29-Jun-2022 15:25
PO	: 1200-25.03.02	Issue Date	: 25-Jul-2022 19:50
C-O-C number	: 2022-June-Mon8/9-Day 3		
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 10		
No. of samples analysed	: 10		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEA-A	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEA-B	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
KR	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD1	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2-FB	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD3	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD4	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PINE	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) POUCE	E298	29-Jun-2022	10-Jul-2022	----	----		14-Jul-2022	28 days	15 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEA-A	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEA-B	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE KR	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD1	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2-FB	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PD3	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD4	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE POUCE	E235.Cl	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA-A	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA-B	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE KR	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2-FB	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD3	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD4	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE POUCE	E378-U	29-Jun-2022	----	----	----		03-Jul-2022	3 days	4 days	× EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA-A	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA-B	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE KR	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2-FB	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD3	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD4	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE POUCE	E235.F	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA-A	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE BEA-B	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE KR	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2-FB	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD3	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD4	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PINE	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE POUCE	E235.NO3-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrite in Water by IC (Low Level)										
HDPE BEA-A	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE BEA-B	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE KR	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2-FB	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD3	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD4	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓

Matrix: **Water**

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Analyte Group / 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 : Nitrite in Water by IC (Low Level)										
HDPE POUCE	E235.NO2-L	29-Jun-2022	----	----	----		02-Jul-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE BEA-A	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE BEA-B	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE KR	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD2	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD2-FB	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD3	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD4	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PINE	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE POUCE	E392	29-Jun-2022	----	----	----		05-Jul-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA-A	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA-B	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE KR	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2-FB	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD3	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD4	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE POUCE	E235.SO4	29-Jun-2022	----	----	----		02-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA-A	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA-B	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) KR	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2-FB	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD3	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD4	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PINE	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) POUCE	E375-T	29-Jun-2022	11-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) BEA-A	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) BEA-B	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) KR	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD1	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD2	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD2-FB	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD3	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD4	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PINE	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) POUCE	E318	29-Jun-2022	10-Jul-2022	----	----		20-Jul-2022	28 days	21 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) BEA-A	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) BEA-B	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) KR	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD1	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2-FB	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD3	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD4	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PINE	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) POUCE	E366	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA-A	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA-B	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) KR	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD1	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2-FB	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD3	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD4	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PINE	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) POUCE	E372-U	29-Jun-2022	10-Jul-2022	----	----		12-Jul-2022	28 days	13 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEA-A	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEA-B	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓

Matrix: **Water**

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Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) KR	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD1	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD2	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD2-FB	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD3	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD4	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PINE	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) POUCE	E421	29-Jun-2022	05-Jul-2022	----	----		05-Jul-2022	180 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA-A	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA-B	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) KR	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD1	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2-FB	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD3	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD4	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) POUCE	E358-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA-A	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA-B	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KR	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2-FB	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD3	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD4	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PINE	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) POUCE	E355-L	29-Jun-2022	10-Jul-2022	----	----		11-Jul-2022	28 days	12 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA-A	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA-B	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KR	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2-FB	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD3	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD4	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PINE	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE POUCE	E290	29-Jun-2022	----	----	----		10-Jul-2022	14 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA-A	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA-B	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE KR	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE PD1	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2-FB	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE PD3	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PD4	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : Conductivity in Water										
HDPE POUCE	E100	29-Jun-2022	----	----	----		10-Jul-2022	28 days	11 days	✓
Physical Tests : pH by Meter										
HDPE POUCE	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	267 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE KR	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	268 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD4	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	268 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BEA-B	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	269 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD3	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	269 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BEA-A	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	270 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD2	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	270 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD1	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	271 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD2-FB	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	271 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE	E108	29-Jun-2022	----	----	----		10-Jul-2022	0.25 hrs	271 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA-A	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE BEA-B	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE KR	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD1	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 PD2-FB	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD3	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD4	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PINE	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE POUCE	E162	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA-A	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA-B	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE KR	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE PD2	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2-FB	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD3	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD4	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE POUCE	E160	29-Jun-2022	----	----	----		06-Jul-2022	7 days	7 days	✓

Legend & Qualifier Definitions

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

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: **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	546345	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	556725	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	546348	1	19	5.2	5.0	✓
Conductivity in Water	E100	546346	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549136	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	556728	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	546353	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	546347	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	546350	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	546351	1	20	5.0	5.0	✓
pH by Meter	E108	546344	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	546352	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	550927	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	556726	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	556727	1	10	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	556730	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	556729	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	556731	1	10	10.0	5.0	✓
TSS by Gravimetry	E160	550925	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	546345	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	556725	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	546348	1	19	5.2	5.0	✓
Conductivity in Water	E100	546346	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549136	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	556728	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	546353	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	546347	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	546350	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	546351	1	20	5.0	5.0	✓
pH by Meter	E108	546344	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	546352	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	550927	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	556726	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	556727	1	10	10.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Nitrogen by Colourimetry	E366	556730	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	556729	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	556731	1	10	10.0	5.0	✓
TSS by Gravimetry	E160	550925	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	546345	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	556725	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	546348	1	19	5.2	5.0	✓
Conductivity in Water	E100	546346	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549136	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	556728	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	546353	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	546347	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	546350	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	546351	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	546352	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	550927	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	556726	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	556727	1	10	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	556730	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	556729	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	556731	1	10	10.0	5.0	✓
TSS by Gravimetry	E160	550925	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	556725	1	16	6.2	5.0	✓
Chloride in Water by IC	E235.Cl	546348	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	549136	1	16	6.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	556728	1	10	10.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	546353	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	546347	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	546350	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	546351	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	550319	2	40	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	546352	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	556726	1	18	5.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	556727	1	10	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	556730	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	556729	1	10	10.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	556731	1	10	10.0	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2201733**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 29-Jun-2022 15:25
PO	: 1200-25.03.02	Date Analysis Commenced	: 02-Jul-2022
C-O-C number	: 2022-June-Mon8/9-Day 3	Issue Date	: 25-Jul-2022 19:50
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 10		
No. of samples analysed	: 10		

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*
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	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: 546344)											
FJ2201726-003	Anonymous	pH	----	E108	0.10	pH units	8.04	8.05	0.0621%	4%	----
Physical Tests (QC Lot: 546345)											
FJ2201726-003	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	97.1	97.0	0.103%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	97.1	97.0	0.103%	20%	----
Physical Tests (QC Lot: 546346)											
FJ2201726-003	Anonymous	conductivity	----	E100	2.0	µS/cm	200	201	0.499%	10%	----
Physical Tests (QC Lot: 550925)											
FJ2201733-001	BEA-A	solids, total suspended [TSS]	----	E160	3.0	mg/L	276	306	10.4%	20%	----
Physical Tests (QC Lot: 550927)											
FJ2201733-001	BEA-A	solids, total dissolved [TDS]	----	E162	13	mg/L	210	222	5.86%	20%	----
Anions and Nutrients (QC Lot: 546347)											
FJ2201726-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.074	0.068	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546348)											
FJ2201726-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546350)											
FJ2201726-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0358	0.0355	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546351)											
FJ2201726-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 546352)											
FJ2201726-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.6	13.7	0.344%	20%	----
Anions and Nutrients (QC Lot: 546353)											
FJ2201726-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0041	0.0036	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 550319)											
EO2204853-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	10.7	10.7	0.599%	20%	----
Anions and Nutrients (QC Lot: 550320)											
FJ2201733-007	POUCE	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	2.44	2.44	0.004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 556725)											
FJ2201733-001	BEA-A	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0378	0.0411	0.0033	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*
Anions and Nutrients (QC Lot: 556726)											
FJ2201733-001	BEA-A	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0185	0.0184	0.00008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 556727)											
FJ2201733-001	BEA-A	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.31	1.22	6.86%	20%	----
Anions and Nutrients (QC Lot: 556730)											
FJ2201733-001	BEA-A	nitrogen, total	7727-37-9	E366	0.150	mg/L	0.989	0.907	0.082	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 556731)											
FJ2201733-001	BEA-A	phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	0.377	0.341	10.00%	20%	----
Organic / Inorganic Carbon (QC Lot: 556728)											
FJ2201733-001	BEA-A	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	32.0	33.2	3.70%	20%	----
Organic / Inorganic Carbon (QC Lot: 556729)											
FJ2201733-001	BEA-A	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	41.3	42.3	2.58%	20%	----
Dissolved Metals (QC Lot: 549136)											
VA22B4523-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	37.7	37.8	0.162%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.376	0.362	3.61%	20%	----

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: 546345)						
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: 546346)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 550925)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 550927)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 546347)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 546348)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 546350)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 546351)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 546352)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 546353)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 550319)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 550320)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 556725)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 556726)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 556727)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 556730)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 556731)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 556728)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 556729)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 549136)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 546344)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 546345)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	91.5	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.3	85.0	115	----
Physical Tests (QCLot: 546346)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 550925)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	105	85.0	115	----
Physical Tests (QCLot: 550927)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 546347)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 546348)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 546350)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 546351)									
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: 546352)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 546353)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	94.7	80.0	120	----
Anions and Nutrients (QCLot: 550319)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 550320)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 556725)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	92.3	85.0	115	----
Anions and Nutrients (QCLot: 556726)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	96.7	80.0	120	----
Anions and Nutrients (QCLot: 556727)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.5	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 556730)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 556731)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	97.0	80.0	120	----
Organic / Inorganic Carbon (QCLot: 556728)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.1	80.0	120	----
Organic / Inorganic Carbon (QCLot: 556729)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 549136)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	95.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	95.9	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: 546347)										
FJ2201726-002	Anonymous	fluoride	16984-48-8	E235.F	1.06 mg/L	1 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 546348)										
FJ2201726-002	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 546350)										
FJ2201726-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.62 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 546351)										
FJ2201726-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.522 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 546352)										
FJ2201726-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 546353)										
FJ2201726-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0326 mg/L	0.03 mg/L	108	70.0	130	----
Anions and Nutrients (QCLot: 550319)										
EO2204854-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.28 mg/L	10 mg/L	92.8	75.0	125	----
Anions and Nutrients (QCLot: 550320)										
FJ2201733-008	PD4	silicate (as SiO2)	7631-86-9	E392	9.84 mg/L	10 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 556725)										
FJ2201733-002	BEA-B	ammonia, total (as N)	7664-41-7	E298	0.0965 mg/L	0.1 mg/L	96.5	75.0	125	----
Anions and Nutrients (QCLot: 556726)										
FJ2201733-002	BEA-B	phosphorus, total dissolved	7723-14-0	E375-T	0.0513 mg/L	0.05 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 556727)										
FJ2201733-002	BEA-B	Kjeldahl nitrogen, total [TKN]	----	E318	1.82 mg/L	2.5 mg/L	72.7	70.0	130	----
Anions and Nutrients (QCLot: 556730)										
FJ2201733-002	BEA-B	nitrogen, total	7727-37-9	E366	1.95 mg/L	2 mg/L	97.4	70.0	130	----
Anions and Nutrients (QCLot: 556731)										
FJ2201733-002	BEA-B	phosphorus, total	7723-14-0	E372-U	0.471 mg/L	0.5 mg/L	94.2	70.0	130	----
Organic / Inorganic Carbon (QCLot: 556728)										
FJ2201733-002	BEA-B	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 556729)										

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
Organic / Inorganic Carbon (QCLot: 556729) - continued										
FJ2201733-002	BEA-B	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Dissolved Metals (QCLot: 549136)										
VA22B4523-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

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 minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
						F/P	P		P				
	BEA-A	29-JUN-22	09:35	Water	4	R	R	R	R	R			
	BEA-B	29-JUN-22	09:45	Water	4	R	R	R	R	R			
	PD2	29-JUN-22	09:10	Water	4	R	R	R	R	R			
	PD2-FB	29-JUN-22	08:40	Water	4	R	R	R	R	R			
	PINE	29-JUN-22	08:15	Water	4	R	R	R	R	R			
	PD1	29-JUN-22	07:45	Water	4	R	R	R	R	R			
	POUCE	29-JUN-22	12:30	Water	4	R	R	R	R	R			
	PD4	29-JUN-22	11:32	Water	4	R	R	R	R	R			
	KR	29-JUN-22	10:50	Water	5	R	R	R	R	R			
	PD3	29-JUN-22	10:20	Water	6	R	R	R	R	R			

Fort St. John

Work Order Reference

FJ2201733

Telephone : +1 250 261 551

FJE Shipping & Receiving
Call Out — Expedite
Priority
Air X
Ground
# of Coolers 2
# of Carboys

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
9.8							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Mich Wolsey	June 29, 2022	15:15

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
R. Clk	29. 29. 22	3:15

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

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.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-June-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	BEA-A	29-JUN-22	09:35	Water	4	R	R	R	R	R			
	BEA-B	29-JUN-22	09:45	Water	4	R	R	R	R	R			
	PD2	29-JUN-22	09:10	Water	4	R	R	R	R	R			
	PD2-FB	29-JUN-22	08:40	Water	4	R	R	R	R	R			
	PINE	29-JUN-22	08:15	Water	4	R	R	R	R	R			
	PD1	29-JUN-22	07:45	Water	4	R	R	R	R	R			
	POUCE	29-JUN-22	12:30	Water	4	R	R	R	R	R			
	PD4	29-JUN-22	11:32	Water	4	R	R	R	R	R			
	KR	29-JUN-22	10:50	Water	5	R	R	R	R	R			
	PD3	29-JUN-22	10:20	Water	6	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2201733

Telephone : +1 250 261 5517

FLAE Shipping & Receiving
Call Out
Expedite
Priority
# of Coolers 2 Air
# of Carboys Ground

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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				
9.8								7

SHIPMENT RELEASE (client use)

Released by: Date: June. 27, 2022. Time: 15:15

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: RICK Date: 6.29.22 Time: 3:15

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: HA Date: 6/30 Time: 6:19P

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201735**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 30-Jun-2022 11:20
PO	: 1200-25.03.02	Date Analysis Commenced	: 08-Jul-2022
C-O-C number	: 2022-JUNE-MON8/9-DAY 4	Issue Date	: 17-Aug-2022 17:09
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Dwayne Bennett	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Kevin Baxter		Metals, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
HTA	*Analytical holding time was exceeded.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: PD5	----	----	----	----
					Client sampling date / time: 30-Jun-2022 09:15	----	----	----	----
					FJ2201735-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	98.5	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	98.5	----	----	----	----
conductivity	----	E100	2.0	µS/cm	195	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	97.2	----	----	----	----
pH	----	E108	0.10	pH units	8.01	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	144	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	121	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0157	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.047	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.430	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0485	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L	0.478	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0014 HTA	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.155 DLHC	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0082	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.69	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.4	----	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	7.37	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	8.26	----	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.27	----	----	----	----
cation sum	----	EC101	0.10	meq/L	2.04	----	----	----	----
ion balance (APHA)	----	EC101	0.010	%	5.34	----	----	----	----

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)					Client sample ID	**PD5**	**----**	**----**	**----**	**----**
					Client sampling date / time	30-Jun-2022 09:15	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		**FJ2201735-001**	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		27.6	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.86	----	----	----	----
potassium, dissolved	7440-09-7	E421	0.050	mg/L		0.503	----	----	----	----
sodium, dissolved	7440-23-5	E421	0.050	mg/L		1.74	----	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201735**	Page	: 1 of 10
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 30-Jun-2022 11:20
PO	: 1200-25.03.02	Issue Date	: 17-Aug-2022 17:09
C-O-C number	: 2022-JUNE-MON8/9-DAY 4		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5	E298	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5	E235.Cl	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5	E378-U	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	3 days	8 days	✖ EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5	E235.F	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5	E235.NO3-L	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	3 days	8 days	✖ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD5	E235.NO2-L	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	3 days	8 days	✖ EHT
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD5	E392	30-Jun-2022	----	----	----		21-Jul-2022	28 days	21 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5	E235.SO4	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD5	E375-T	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD5	E318	30-Jun-2022	09-Jul-2022	----	----		09-Jul-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD5	E372-U	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD5	E421	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD5	E358-L	30-Jun-2022	12-Jul-2022	----	----		12-Jul-2022	28 days	12 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD5	E355-L	30-Jun-2022	12-Jul-2022	----	----		12-Jul-2022	28 days	12 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD5	E290	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	14 days	8 days	✓
Physical Tests : Conductivity in Water										
HDPE PD5	E100	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / 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 PD5	E108	30-Jun-2022	08-Jul-2022	----	----		08-Jul-2022	0.25 hrs	192 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PD5	E162	30-Jun-2022	----	----	----		08-Jul-2022	7 days	8 days	× EHT
Physical Tests : TSS by Gravimetry										
HDPE PD5	E160	30-Jun-2022	----	----	----		08-Jul-2022	7 days	8 days	× EHT

Legend & Qualifier Definitions

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

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: **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	554430	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	554996	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	554327	1	1	100.0	5.0	✓
Conductivity in Water	E100	554429	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	554400	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	558598	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	554438	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	554328	1	1	100.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	554330	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	554331	1	1	100.0	5.0	✓
pH by Meter	E108	554428	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	572421	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	554329	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	554080	1	1	100.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	554138	1	1	100.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	555083	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	558599	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	554141	1	1	100.0	5.0	✓
TSS by Gravimetry	E160	554079	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	554430	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	554996	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	554327	1	1	100.0	5.0	✓
Conductivity in Water	E100	554429	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	554400	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	558598	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	554438	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	554328	1	1	100.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	554330	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	554331	1	1	100.0	5.0	✓
pH by Meter	E108	554428	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	572421	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	554329	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	554080	1	1	100.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	554138	1	1	100.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	555083	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	558599	1	16	6.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	554141	0	1	0.0	5.0	×
TSS by Gravimetry	E160	554079	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	554430	1	17	5.8	5.0	✓
Ammonia by Fluorescence	E298	554996	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	554327	1	1	100.0	5.0	✓
Conductivity in Water	E100	554429	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	554400	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	558598	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	554438	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	554328	1	1	100.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	554330	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	554331	1	1	100.0	5.0	✓
Reactive Silica by Colourimetry	E392	572421	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	554329	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	554080	1	1	100.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	554138	1	1	100.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	555083	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	558599	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	554141	0	1	0.0	5.0	×
TSS by Gravimetry	E160	554079	1	1	100.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	554996	1	2	50.0	5.0	✓
Chloride in Water by IC	E235.Cl	554327	0	1	0.0	5.0	×
Dissolved Metals in Water by CRC ICPMS	E421	554400	0	1	0.0	5.0	×
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	558598	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	554438	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	554328	0	1	0.0	5.0	×
Nitrate in Water by IC (Low Level)	E235.NO3-L	554330	0	1	0.0	5.0	×
Nitrite in Water by IC (Low Level)	E235.NO2-L	554331	0	1	0.0	5.0	×
Reactive Silica by Colourimetry	E392	572421	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	554329	0	1	0.0	5.0	×
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	554138	0	1	0.0	5.0	×
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	555083	0	1	0.0	5.0	×
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	558599	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	554141	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	“Hardness (as $CaCO_3$), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2201735**	Page	: 1 of 9
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 30-Jun-2022 11:20
PO	: 1200-25.03.02	Date Analysis Commenced	: 08-Jul-2022
C-O-C number	: 2022-JUNE-MON8/9-DAY 4	Issue Date	: 17-Aug-2022 17:09
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Dwayne Bennett	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Kevin Baxter		Calgary Metals, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta

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: 554079)											
FJ2201735-001	PD5	solids, total suspended [TSS]	----	E160	3.0	mg/L	121	121	0.165%	20%	----
Physical Tests (QC Lot: 554080)											
FJ2201735-001	PD5	solids, total dissolved [TDS]	----	E162	20	mg/L	144	138	6	Diff <2x LOR	----
Physical Tests (QC Lot: 554428)											
CG2208292-002	Anonymous	pH	----	E108	0.10	pH units	7.68	7.90	2.82%	4%	----
Physical Tests (QC Lot: 554429)											
CG2208292-002	Anonymous	conductivity	----	E100	2.0	µS/cm	423	422	0.237%	10%	----
Physical Tests (QC Lot: 554430)											
CG2208292-002	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	198	222	11.4%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	198	222	11.4%	20%	----
Anions and Nutrients (QC Lot: 554138)											
FJ2201735-001	PD5	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0082	0.0075	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554141)											
FJ2201735-001	PD5	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.155	0.151	2.78%	20%	----
Anions and Nutrients (QC Lot: 554327)											
FJ2201735-001	PD5	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554328)											
FJ2201735-001	PD5	fluoride	16984-48-8	E235.F	0.020	mg/L	0.047	0.044	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554329)											
FJ2201735-001	PD5	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.4	14.3	0.504%	20%	----
Anions and Nutrients (QC Lot: 554330)											
FJ2201735-001	PD5	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0485	0.0475	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554331)											
FJ2201735-001	PD5	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554438)											
CG2208870-015	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 554996)											
FJ2201735-001	PD5	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0157	0.0171	0.0014	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*
Anions and Nutrients (QC Lot: 555083)											
FJ2201735-001	PD5	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.430	0.427	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 572421)											
FJ2201735-001	PD5	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.69	3.64	0.05	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 558598)											
CG2208481-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	8.48	8.83	4.02%	20%	----
Organic / Inorganic Carbon (QC Lot: 558599)											
CG2208481-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	8.79	8.70	1.04%	20%	----
Dissolved Metals (QC Lot: 554400)											
FJ2201735-001	PD5	calcium, dissolved	7440-70-2	E421	0.050	mg/L	27.6	27.6	0.0895%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.86	6.85	0.0850%	20%	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.503	0.499	0.930%	20%	----
		sodium, dissolved	7440-23-5	E421	0.050	mg/L	1.74	1.73	0.475%	20%	----

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: 554079)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 554080)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 554429)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 554430)						
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	----
Anions and Nutrients (QCLot: 554138)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 554327)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 554328)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 554329)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 554330)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 554331)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 554438)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 554996)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 555083)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 572421)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 558598)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 558599)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 554400)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	<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: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 554079)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 554080)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.7	85.0	115	----
Physical Tests (QCLot: 554428)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 554429)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.6	90.0	110	----
Physical Tests (QCLot: 554430)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	108	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.3	85.0	115	----
Anions and Nutrients (QCLot: 554138)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	96.4	80.0	120	----
Anions and Nutrients (QCLot: 554327)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 554328)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 554329)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 554330)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 554331)									
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: 554438)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 554996)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 555083)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 572421)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Organic / Inorganic Carbon (QCLot: 558598)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Organic / Inorganic Carbon (QCLot: 558598) - continued									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	91.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 558599)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	94.3	80.0	120	----
Dissolved Metals (QCLot: 554400)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	101	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	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**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report: Spike Concentration	Spike Target	Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 554438)										
CG2208870-016	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0505 mg/L	0.05 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 554996)										
SK2203418-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.100 mg/L	0.1 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 572421)										
VA22B6563-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.66 mg/L	10 mg/L	96.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 558598)										
CG2208481-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 558599)										
CG2208481-001	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-June-MON8/9- Day 4

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IonBalance-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
						F/P	P	P					
	PD5	30-Jun-22	09:15	Water	4	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2201735

Telephone : +1 250 261 5617

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
10.7							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Wolsey	June 30 2022	11:20

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
RICK	6.30.22	11:20

FINAL SHIPMENT RECEPTION (ALS use only)

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.**

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201956**	Page	: 1 of 5
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 1	Issue Date	: 10-May-2023 15:48
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Jenna Smith	Account Manager	Administration, Calgary, Alberta
Katarzyna Glinka	Analyst	Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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
µg/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
L	litres
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

Amendment (10/5/2023): This report has been amended and re-released to allow the reporting of additional analytical data. Added ug/L Calculation data for Chlorophyll-a.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
					Client sampling date / time	25-Jul-2022 08:10	25-Jul-2022 07:35	25-Jul-2022 10:20	25-Jul-2022 10:45	25-Jul-2022
						FJ2201956-001	FJ2201956-002	FJ2201956-003	FJ2201956-004	FJ2201956-005
						Result	Result	Result	Result	Result
Field Tests										
Sampling volume, field	----	EF003	0.010	L		0.070	0.070	0.070	0.070	0.070
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		108	86.4	92.2	87.7	<1.0
Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		108	86.4	92.2	87.7	<1.0
Colour, true	----	E329	5.0	CU		5.1	5.4	5.3	5.3	<5.0
Conductivity	----	E100	2.0	µS/cm		174	175	177	178	<2.0
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		89.6	90.0	91.6	90.6	<0.50
pH	----	E108	0.10	pH units		8.08	8.05	8.09	8.03	5.57
Solids, total dissolved [TDS]	----	E162	10	mg/L		132	118	119	120	<10
Solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	4.5	<3.0	<3.0	<3.0
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0095	0.0092	<0.0050	<0.0050	<0.0050
Chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F	0.020	mg/L		0.036	0.036	0.040	0.037	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.168	0.106	0.097	0.134	<0.050
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0422	0.0444	0.0376	0.0606	<0.0050
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.210	0.150	0.135	0.195	<0.050
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0055	0.0080	0.0035	0.0038	<0.0020
Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0036	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.33	4.33	4.38	4.46	<0.50
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		14.1	14.1	14.6	14.1	<0.30
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.45	2.85	3.05	2.76	----
Carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.72	2.61	2.87	2.62	<0.50
Dissolved Metals										

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
					Client sampling date / time	25-Jul-2022 08:10	25-Jul-2022 07:35	25-Jul-2022 10:20	25-Jul-2022 10:45	25-Jul-2022
Analyte	CAS Number	Method	LOR	Unit		FJ2201956-001	FJ2201956-002	FJ2201956-003	FJ2201956-004	FJ2201956-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421	0.050	mg/L		25.6	25.7	26.1	25.9	<0.050
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.24	6.26	6.43	6.31	<0.0050
Dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Plant Pigments										
Chlorophyll a	479-61-8	EC870B	0.010	µg/L		3.46	1.68	5.37	1.84	<0.028
Chlorophyll a	479-61-8	E870B	0.0020	µg/sample		0.242	0.118	0.376	0.129	<0.0020

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201956**	Page	: 1 of 21
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Issue Date	: 10-May-2023 15:48
C-O-C number	: 2022-July-MON8/9-Day 1		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Deep	E298	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Shallow	E298	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Travel Blank	E298	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Deep	E298	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Shallow	E298	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Deep	E235.Cl	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Shallow	E235.Cl	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE Travel Blank	E235.Cl	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-Deep	E235.Cl	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-Shallow	E235.Cl	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Deep	E378-U	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Shallow	E378-U	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Travel Blank	E378-U	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Deep	E378-U	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Shallow	E378-U	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Deep	E235.F	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Shallow	E235.F	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Travel Blank	E235.F	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Deep	E235.F	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Shallow	E235.F	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO3-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO3-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO3-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO3-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO3-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO2-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO2-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO2-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO2-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO2-L	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-Deep	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-Shallow	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Travel Blank	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE W1-Deep	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-Shallow	E392	25-Jul-2022	----	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Deep	E235.SO4	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Shallow	E235.SO4	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Travel Blank	E235.SO4	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Deep	E235.SO4	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Shallow	E235.SO4	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Deep	E375-T	25-Jul-2022	27-Jul-2022	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E375-T	25-Jul-2022	27-Jul-2022	----	----		29-Jul-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Deep	E375-T	25-Jul-2022	27-Jul-2022	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E375-T	25-Jul-2022	27-Jul-2022	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-Deep	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-Shallow	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Travel Blank	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-Deep	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-Shallow	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-Deep	E372-U	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-Shallow	E372-U	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Travel Blank	E372-U	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Deep	E372-U	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Shallow	E372-U	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Deep	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-Shallow	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Travel Blank	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Deep	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-Shallow	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Field Tests : Field Volume (L)										
Opaque HDPE										
D1-Deep	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	----	

Matrix: **Water**

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

Analyte Group / 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 : Field Volume (L)										
Opaque HDPE D1-Shallow	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	----	
Field Tests : Field Volume (L)										
Opaque HDPE Travel Blank	EF003	25-Jul-2022	----	----	----		24-Jul-2022	----	----	
Field Tests : Field Volume (L)										
Opaque HDPE W1-Deep	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	----	
Field Tests : Field Volume (L)										
Opaque HDPE W1-Shallow	EF003	25-Jul-2022	----	----	----		25-Jul-2022	----	----	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Deep	E358-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E358-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Deep	E358-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E358-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Deep	E355-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Shallow	E355-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Travel Blank	E355-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Deep	E355-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Shallow	E355-L	25-Jul-2022	26-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Deep	E290	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Shallow	E290	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Deep	E290	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Shallow	E290	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	14 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Deep	E329	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Shallow	E329	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Travel Blank	E329	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Deep	E329	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Shallow	E329	25-Jul-2022	26-Jul-2022	----	----		26-Jul-2022	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Deep	E100	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Shallow	E100	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Deep	E100	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE W1-Shallow	E100	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE D1-Deep	E108	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-Shallow	E108	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Deep	E108	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Shallow	E108	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-Deep	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-Shallow	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Travel Blank	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 W1-Deep	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Shallow	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Deep	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Shallow	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Deep	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Shallow	E160	25-Jul-2022	----	----	----		26-Jul-2022	7 days	1 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-Deep	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-Shallow	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE										
Travel Blank	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE										
W1-Deep	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE										
W1-Shallow	E870B	25-Jul-2022	30-Jul-2022	28 days	5 days	✓	30-Jul-2022	28 days	0 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	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
pH by Meter	E108	579207	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
pH by Meter	E108	579207	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	579209	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	583708	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	577365	1	5	20.0	5.0	✓
Conductivity in Water	E100	579208	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	579161	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	5.0	✓
TSS by Gravimetry	E160	577697	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	577766	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	577399	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	577245	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	577006	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	577398	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	577395	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	577397	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	579612	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	577396	1	14	7.1	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	577534	1	18	5.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	577246	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578760	2	33	6.0	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B Vancouver - Environmental	Water	CALC	Convert results to sample concentration based on support lab filter information.
Field Volume (L)	EF003 Calgary - Environmental	Water		Field measurement of sampling volume provided by client and recorded on ALS report may affect the validity of results.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2201956**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 12:43
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 1	Issue Date	: 10-May-2023 15:48
Sampler	: Pat Beaupre 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Jenna Smith	Account Manager	Calgary Administration, Calgary, Alberta
Katarzyna Glinka	Analyst	Calgary Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 577365)											
FJ2201956-001	W1-Shallow	Colour, true	----	E329	5.0	CU	5.1	5.0	0.04	Diff <2x LOR	----
Physical Tests (QC Lot: 577697)											
FC2201673-003	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	48.7	47.7	2.07%	20%	----
Physical Tests (QC Lot: 579161)											
CG2209826-003	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	286	269	6.12%	20%	----
Physical Tests (QC Lot: 579162)											
FJ2201956-004	D1-Deep	Solids, total dissolved [TDS]	----	E162	20	mg/L	120	120	0	Diff <2x LOR	----
Physical Tests (QC Lot: 579207)											
CG2209821-001	Anonymous	pH	----	E108	0.10	pH units	8.04	8.08	0.496%	4%	----
Physical Tests (QC Lot: 579208)											
CG2209821-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	406	411	1.22%	10%	----
Physical Tests (QC Lot: 579209)											
CG2209821-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	225	260	14.4%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	225	260	14.4%	20%	----
Anions and Nutrients (QC Lot: 577006)											
CG2209743-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577395)											
FJ2201956-001	W1-Shallow	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0422	0.0396	0.0026	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577396)											
FJ2201956-001	W1-Shallow	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.1	14.1	0.0718%	20%	----
Anions and Nutrients (QC Lot: 577397)											
FJ2201956-001	W1-Shallow	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577398)											
FJ2201956-001	W1-Shallow	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.036	0.036	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 577399)											
FJ2201956-001	W1-Shallow	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 577534)											
CG2209725-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.800	mg/L	11.6	11.3	2.54%	20%	----
Anions and Nutrients (QC Lot: 577766)											
CG2209815-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 578760)											
CG2209739-011	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0080	0.0085	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 578761)											
FJ2201956-002	W1-Deep	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0080	0.0059	0.0021	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 579493)											
FC2201686-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0212	0.0203	4.34%	20%	----
Anions and Nutrients (QC Lot: 579612)											
EO2205774-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	14.1	14.2	0.520%	20%	----
Organic / Inorganic Carbon (QC Lot: 577245)											
CG2209746-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 577246)											
CG2209746-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.17	1.46	0.71	Diff <2x LOR	----
Dissolved Metals (QC Lot: 581382)											
CG2209952-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	95.0	94.3	0.687%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	43.0	42.5	1.12%	20%	----
Plant Pigments (QC Lot: 583708)											
FJ2201956-001	W1-Shallow	Chlorophyll a	479-61-8	E870B	0.0020	µg/sample	0.242	0.218	10.9%	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: 577365)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 577697)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 579161)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 579162)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 579208)						
Conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 579209)						
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	----
Anions and Nutrients (QCLot: 577006)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 577395)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 577396)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 577397)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 577398)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 577399)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 577534)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 577766)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 578760)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 578760) - continued						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 578761)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 579493)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 579612)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 577245)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 577246)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 581382)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Plant Pigments (QCLot: 583708)						
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	<0.0020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 577365)									
Colour, true	----	E329	5	CU	100 CU	96.3	85.0	115	----
Physical Tests (QCLot: 577697)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.8	85.0	115	----
Physical Tests (QCLot: 579161)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 579162)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 579207)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 579208)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.7	90.0	110	----
Physical Tests (QCLot: 579209)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	117	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Anions and Nutrients (QCLot: 577006)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	106	80.0	120	----
Anions and Nutrients (QCLot: 577395)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 577396)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 577397)									
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: 577398)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 577399)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 577534)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 577766)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	112	85.0	115	----
Anions and Nutrients (QCLot: 578760)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 578760) - continued									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	109	80.0	120	----
Anions and Nutrients (QCLot: 578761)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 579493)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	94.1	80.0	120	----
Anions and Nutrients (QCLot: 579612)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Organic / Inorganic Carbon (QCLot: 577245)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 577246)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 581382)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	80.0	120	----
Plant Pigments (QCLot: 583708)									
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	99.0	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: 577006)										
CG2209743-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0544 mg/L	0.05 mg/L	109	70.0	130	----
Anions and Nutrients (QCLot: 577395)										
FJ2201956-005	Travel Blank	Nitrate (as N)	14797-55-8	E235.NO3-L	2.09 mg/L	2.5 mg/L	83.6	75.0	125	----
Anions and Nutrients (QCLot: 577396)										
FJ2201956-005	Travel Blank	Sulfate (as SO4)	14808-79-8	E235.SO4	85.0 mg/L	100 mg/L	85.0	75.0	125	----
Anions and Nutrients (QCLot: 577397)										
FJ2201956-005	Travel Blank	Nitrite (as N)	14797-65-0	E235.NO2-L	0.424 mg/L	0.5 mg/L	84.9	75.0	125	----
Anions and Nutrients (QCLot: 577398)										
FJ2201956-005	Travel Blank	Fluoride	16984-48-8	E235.F	0.844 mg/L	1 mg/L	84.4	75.0	125	----
Anions and Nutrients (QCLot: 577399)										
FJ2201956-005	Travel Blank	Chloride	16887-00-6	E235.Cl	83.1 mg/L	100 mg/L	83.1	75.0	125	----
Anions and Nutrients (QCLot: 577534)										
CG2209725-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 577766)										
CG2209816-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.109 mg/L	0.1 mg/L	109	75.0	125	----
Anions and Nutrients (QCLot: 578760)										
CG2209739-012	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0670 mg/L	0.0676 mg/L	99.1	70.0	130	----
Anions and Nutrients (QCLot: 578761)										
FJ2201956-003	D1-Shallow	Phosphorus, total	7723-14-0	E372-U	0.0653 mg/L	0.0676 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 579493)										
FC2201686-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0674 mg/L	0.0676 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 579612)										
EO2205776-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.97 mg/L	10 mg/L	99.7	75.0	125	----
Organic / Inorganic Carbon (QCLot: 577245)										
CG2209746-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.06 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 577246)										
CG2209746-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	4.72 mg/L	5 mg/L	94.3	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: 581382)										
CG2209963-001	Anonymous	Calcium, dissolved	7440-70-2	E421	38.9 mg/L	40 mg/L	97.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	9.60 mg/L	10 mg/L	96.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-July-MON8/9- Day 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES ☑ NO
	Copy of Invoice with Report YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate, colour-true	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1-Shallow	25-Jul-22	08:10	Water		R	R	R	R	R			
	W1-Deep	25-Jul-22	07:35	Water		R	R	R	R	R			
	D1-Shallow	25-Jul-22	10:20	Water		R	R	R	R	R			
	D1-Deep	25-Jul-22	10:45	Water		R	R	R	R	R			
	Travel Blank			Water		R	R		R	R			

Fort St. John
Work Order Reference
FJ2201956

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
12.6							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Dennis Finnell		

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	7-25-22	11:41

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2201963**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 16:23
PO	: 1200-25.03.02	Date Analysis Commenced	: 27-Jul-2022
C-O-C number	: 2022-July-MON8/9- Day 1b/2b	Issue Date	: 17-Aug-2022 17:18
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Shirley Li		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta

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 Unit
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	MD	----	----	----	----
					Client sampling date / time	25-Jul-2022 15:15	----	----	----	----
						FJ2201963-001	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		126	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		126	----	----	----	----
conductivity	----	E100	2.0	µS/cm		208	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		106	----	----	----	----
pH	----	E108	0.10	pH units		7.29	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		176	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		60.2	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0334	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.073	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.376	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0064	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	----	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.382	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0957	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0030	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		3.30	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		9.23	----	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		8.28	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		6.93	----	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		28.8	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		8.26	----	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2201963**	Page	: 1 of 10
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 16:23
PO	: 1200-25.03.02	Issue Date	: 17-Aug-2022 17:18
C-O-C number	: 2022-July-MON8/9- Day 1b/2b		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MD	E298	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MD	E235.Cl	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MD	E235.F	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
MD	E235.NO3-L	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
MD	E235.NO2-L	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
MD	E392	25-Jul-2022	----	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MD	E235.SO4	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD	E375-T	25-Jul-2022	27-Jul-2022	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MD	E318	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MD	E372-U	25-Jul-2022	27-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MD	E421	25-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MD	E358-L	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MD	E355-L	25-Jul-2022	27-Jul-2022	----	----		27-Jul-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MD	E290	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE MD	E100	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE MD	E108	25-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	66 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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										
MD	E162	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
MD	E160	25-Jul-2022	----	----	----		28-Jul-2022	7 days	3 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	580568	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	578735	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	579278	1	1	100.0	5.0	✓
Conductivity in Water	E100	580566	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	578537	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	579272	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	579275	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	579276	1	16	6.2	5.0	✓
pH by Meter	E108	580567	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	579277	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	579162	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	579169	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	578538	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578971	1	8	12.5	5.0	✓
TSS by Gravimetry	E160	579149	1	18	5.5	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	580568	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	578735	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	579278	1	1	100.0	5.0	✓
Conductivity in Water	E100	580566	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	578537	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	579272	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	579275	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	579276	1	16	6.2	5.0	✓
pH by Meter	E108	580567	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	579277	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	579162	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	579169	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	578538	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578971	1	8	12.5	5.0	✓
TSS by Gravimetry	E160	579149	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*
Method Blanks (MB)							
Alkalinity Species by Titration	E290	580568	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	578735	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	579278	1	1	100.0	5.0	✓
Conductivity in Water	E100	580566	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	578537	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	579272	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	579275	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	579276	1	16	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	579277	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	579162	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	579169	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	578538	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578971	1	8	12.5	5.0	✓
TSS by Gravimetry	E160	579149	1	18	5.5	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	578735	1	13	7.6	5.0	✓
Chloride in Water by IC	E235.Cl	579278	0	1	0.0	5.0	×
Dissolved Metals in Water by CRC ICPMS	E421	581382	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	578537	1	11	9.0	5.0	✓
Fluoride in Water by IC	E235.F	579272	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	579275	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	579276	1	16	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	579277	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	579493	1	10	10.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	579169	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	578538	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	578971	1	8	12.5	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

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

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2201963**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Jul-2022 16:23
PO	: 1200-25.03.02	Date Analysis Commenced	: 27-Jul-2022
C-O-C number	: 2022-July-MON8/9- Day 1b/2b	Issue Date	: 17-Aug-2022 17:18
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
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*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Dwayne Bennett	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Shirley Li		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta

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: 579149)											
CG2209848-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	672	600	11.3%	20%	----
Physical Tests (QC Lot: 579162)											
FJ2201956-004	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	120	120	0	Diff <2x LOR	----
Physical Tests (QC Lot: 580566)											
CG2209830-010	Anonymous	conductivity	----	E100	2.0	µS/cm	296	294	0.678%	10%	----
Physical Tests (QC Lot: 580567)											
CG2209830-010	Anonymous	pH	----	E108	0.10	pH units	7.21	7.32	1.51%	4%	----
Physical Tests (QC Lot: 580568)											
CG2209830-010	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	165	166	0.181%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	165	166	0.181%	20%	----
Anions and Nutrients (QC Lot: 578735)											
CG2209838-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0559	0.0591	5.56%	20%	----
Anions and Nutrients (QC Lot: 578971)											
CG2209826-005	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0230	0.0229	0.409%	20%	----
Anions and Nutrients (QC Lot: 579169)											
EO2205842-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	3.21	3.16	1.70%	20%	----
Anions and Nutrients (QC Lot: 579272)											
CG2209837-004	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.180	0.187	0.008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 579275)											
CG2209837-004	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	1.97	1.97	0.0912%	20%	----
Anions and Nutrients (QC Lot: 579276)											
CG2209837-004	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0435	0.0458	0.0023	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 579277)											
CG2209837-004	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	466	466	0.0530%	20%	----
Anions and Nutrients (QC Lot: 579278)											
FJ2201963-001	MD	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 579493)											
FC2201686-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0212	0.0203	4.34%	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*
Anions and Nutrients (QC Lot: 583375)											
FJ2201963-001	MD	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.30	3.30	0.002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 578537)											
CG2209830-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.84	0.70	0.13	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 578538)											
CG2209830-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 581382)											
CG2209952-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	95.0	94.3	0.687%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	43.0	42.5	1.12%	20%	----

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: 579149)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 579162)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 580566)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 580568)						
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	----
Anions and Nutrients (QCLot: 578735)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 578971)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 579169)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 579272)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 579275)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 579276)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 579277)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 579278)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 579493)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 583375)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 578537)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 578538)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 581382)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 579149)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.4	85.0	115	----
Physical Tests (QCLot: 579162)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 580566)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.7	90.0	110	----
Physical Tests (QCLot: 580567)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 580568)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	102	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 578735)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	107	85.0	115	----
Anions and Nutrients (QCLot: 578971)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 579169)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 579272)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 579275)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 579276)									
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: 579277)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 579278)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 579493)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	94.1	80.0	120	----
Anions and Nutrients (QCLot: 583375)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	102	85.0	115	----
Organic / Inorganic Carbon (QCLot: 578537)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 578537) - continued									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	112	80.0	120	----
Organic / Inorganic Carbon (QCLot: 578538)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 581382)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	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: 578735)										
CG2209838-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.108 mg/L	0.1 mg/L	108	75.0	125	----
Anions and Nutrients (QCLot: 578971)										
CG2209826-006	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0608 mg/L	0.0676 mg/L	90.0	70.0	130	----
Anions and Nutrients (QCLot: 579169)										
FJ2201963-001	MD	Kjeldahl nitrogen, total [TKN]	----	E318	2.62 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 579272)										
CG2209877-013	Anonymous	fluoride	16984-48-8	E235.F	0.922 mg/L	1 mg/L	92.2	75.0	125	----
Anions and Nutrients (QCLot: 579275)										
CG2209877-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.25 mg/L	2.5 mg/L	89.8	75.0	125	----
Anions and Nutrients (QCLot: 579276)										
CG2209877-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.461 mg/L	0.5 mg/L	92.2	75.0	125	----
Anions and Nutrients (QCLot: 579277)										
CG2209877-013	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	90.8 mg/L	100 mg/L	90.8	75.0	125	----
Anions and Nutrients (QCLot: 579493)										
FC2201686-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0674 mg/L	0.0676 mg/L	99.7	70.0	130	----
Anions and Nutrients (QCLot: 583375)										
FJ2201982-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.84 mg/L	10 mg/L	98.4	75.0	125	----
Organic / Inorganic Carbon (QCLot: 578537)										
CG2209830-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.61 mg/L	5 mg/L	112	70.0	130	----
Organic / Inorganic Carbon (QCLot: 578538)										
CG2209830-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.07 mg/L	5 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 581382)										
CG2209963-001	Anonymous	calcium, dissolved	7440-70-2	E421	38.9 mg/L	40 mg/L	97.2	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	9.60 mg/L	10 mg/L	96.0	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-July-MON8/9- Day 2 (15)

Canada Toll Free: 1 800 668 9878

Page of

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

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 minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs:

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): **ALS Contact:** Sneha Sansare **Sampler:** Pat Beaupre

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	MD	25-Jul-22	15:15	Water		R		R	R	R			
	PC1			Water		R		R	R	R			

Fort St. John
Work Order Reference
FJ2201963

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
22.3	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: July 25/22	Time: 16:15	Received by:	Date: 7-25-22	Time: 16.15	Received by:	Date:	Time:

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

ALS 2021 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	: **FJ2201982**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 26-Jul-2022 18:23
PO	: 1200-25.03.02	Date Analysis Commenced	: 28-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day2	Issue Date	: 06-Jun-2023 14:38
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta

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
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	CG Calgary - Environmental	2559 29th Street NE, Calgary, Alberta
B	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR1	PR2	HD	PR3	PC1
						Client sampling date / time	26-Jul-2022 09:22	26-Jul-2022 16:20	26-Jul-2022 16:52	26-Jul-2022 13:10	26-Jul-2022 10:15
							FJ2201982-001	FJ2201982-002	FJ2201982-003	FJ2201982-004	FJ2201982-005
							Result	Result	Result	Result	Result
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		96.8	98.0	203	105	105
Alkalinity, carbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, phenolphthalein (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/CG	A	1.0	mg/L		96.8	98.0	203	105	105
Colour, true	----	E329/CG	A	5.0	CU		6.3	6.9	5.9	6.6	6.7
Conductivity	----	E100/CG	A	2.0	µS/cm		186	186	398	199	186
Hardness (as CaCO3), dissolved	----	EC100/CG		0.50	mg/L		90.5	91.7	212	98.1	90.8
pH	----	E108/CG	A	0.10	pH units		7.26	7.24	7.86	7.28	7.23
Solids, total dissolved [TDS]	----	E162/CG	A	10	mg/L		120	120	236	124	110
Solids, total suspended [TSS]	----	E160/CG	A	3.0	mg/L		<3.0	7.1	15.7	16.5	<3.0
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/CG	A	0.0050	mg/L		0.0057	<0.0050	<0.0050	<0.0050	0.0068
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L		0.035	0.035	0.091	0.039	0.034
Kjeldahl nitrogen, total [TKN]	----	E318/CG	A	0.050	mg/L		0.074	0.089	0.130	0.130	0.100
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	A	0.0050	mg/L		0.0700	0.0672	0.0103	0.0691	0.0694
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	EC368/CG		0.050	mg/L		0.144	0.156	0.140	0.199	0.169
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U/CG	A	0.0020	mg/L		0.0036	0.0088	0.0304	0.0355	0.0032
Phosphorus, total dissolved	7723-14-0	E375-T/CG	A	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicate (as SiO2)	7631-86-9	E392/VA	B	0.50	mg/L		4.50	4.44	3.78	4.46	4.53
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L		14.2	14.5	46.1	16.4	14.1
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/CG	A	0.50	mg/L		2.94	2.49	2.27	2.74	2.55
Carbon, total organic [TOC]	----	E355-L/CG	A	0.50	mg/L		2.54	2.62	2.19	2.69	2.62
Dissolved Metals											

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR1	PR2	HD	PR3	PC1
						Client sampling date / time	26-Jul-2022 09:22	26-Jul-2022 16:20	26-Jul-2022 16:52	26-Jul-2022 13:10	26-Jul-2022 10:15
							FJ2201982-001	FJ2201982-002	FJ2201982-003	FJ2201982-004	FJ2201982-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L		26.0	26.3	57.4	27.9	26.1
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L		6.22	6.33	16.6	6.90	6.22
Dissolved metals filtration location	----	EP421/CG		-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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	: **FJ2201982**	Page	: 1 of 20
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 26-Jul-2022 18:23
PO	: 1200-25.03.02	Issue Date	: 06-Jun-2023 14:38
C-O-C number	: 2022-July-MON8/9-Day2		
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD	E298	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PC1	E298	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR1	E298	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2	E298	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR3	E298	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD	E235.Cl	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PC1	E235.Cl	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PR1	E235.Cl	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2	E235.Cl	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR3	E235.Cl	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD	E378-U	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1	E378-U	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1	E378-U	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2	E378-U	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3	E378-U	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD	E235.F	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1	E235.F	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1	E235.F	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2	E235.F	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3	E235.F	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD	E235.NO3-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1	E235.NO3-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1	E235.NO3-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2	E235.NO3-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR3	E235.NO3-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD	E235.NO2-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1	E235.NO2-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1	E235.NO2-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2	E235.NO2-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3	E235.NO2-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD	E392	26-Jul-2022	----	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PC1	E392	26-Jul-2022	----	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR2	E392	26-Jul-2022	----	----	----		29-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PR3	E392	26-Jul-2022	----	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR1	E392	26-Jul-2022	----	----	----		29-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD	E235.SO4	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1	E235.SO4	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1	E235.SO4	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2	E235.SO4	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3	E235.SO4	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD	E375-T	26-Jul-2022	28-Jul-2022	----	----		31-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1	E375-T	26-Jul-2022	28-Jul-2022	----	----		31-Jul-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1	E375-T	26-Jul-2022	28-Jul-2022	----	----		31-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2	E375-T	26-Jul-2022	28-Jul-2022	----	----		31-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3	E375-T	26-Jul-2022	28-Jul-2022	----	----		31-Jul-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD	E318	26-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PC1	E318	26-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR1	E318	26-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR2	E318	26-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR3	E318	26-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD	E372-U	26-Jul-2022	28-Jul-2022	----	----		29-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1	E372-U	26-Jul-2022	28-Jul-2022	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1	E372-U	26-Jul-2022	28-Jul-2022	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2	E372-U	26-Jul-2022	28-Jul-2022	----	----		29-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3	E372-U	26-Jul-2022	28-Jul-2022	----	----		29-Jul-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD	E421	26-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PC1	E421	26-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR1	E421	26-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR2	E421	26-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR3	E421	26-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	180 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD	E358-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PC1	E358-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1	E358-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2	E358-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3	E358-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD	E355-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1	E355-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1	E355-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2	E355-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3	E355-L	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD	E290	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1	E290	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1	E290	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2	E290	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3	E290	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD	E329	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1	E329	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR1	E329	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PR2	E329	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR3	E329	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE HD	E100	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PC1	E100	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1	E100	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PR2	E100	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3	E100	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE HD	E108	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PC1	E108	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PR1	E108	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2	E108	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3	E108	26-Jul-2022	28-Jul-2022	----	----		28-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD	E162	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PC1	E162	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR1	E162	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR2	E162	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR3	E162	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD	E160	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE PC1	E160	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1	E160	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2	E160	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3	E160	26-Jul-2022	----	----	----		29-Jul-2022	7 days	3 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	580691	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	581149	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	580678	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	581691	1	8	12.5	5.0	✓
Conductivity in Water	E100	580690	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	583200	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	580359	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	580978	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	580677	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	580674	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	580675	1	12	8.3	5.0	✓
pH by Meter	E108	580689	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	580676	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	581026	1	15	6.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	581018	2	21	9.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	582926	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	580360	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	581017	1	15	6.6	5.0	✓
TSS by Gravimetry	E160	581060	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	580691	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	581149	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	580678	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	581691	1	8	12.5	5.0	✓
Conductivity in Water	E100	580690	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	583200	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	580359	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	580978	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	580677	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	580674	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	580675	1	12	8.3	5.0	✓
pH by Meter	E108	580689	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	580676	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	581026	1	15	6.6	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							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	581018	2	21	9.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	582926	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	580360	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	581017	1	15	6.6	5.0	✓
TSS by Gravimetry	E160	581060	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	580691	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	581149	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	580678	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	581691	1	8	12.5	5.0	✓
Conductivity in Water	E100	580690	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	583200	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	580359	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	580978	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	580677	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	580674	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	580675	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	580676	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	581026	1	15	6.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	581018	2	21	9.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	582926	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	580360	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	581017	1	15	6.6	5.0	✓
TSS by Gravimetry	E160	581060	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	581149	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	580678	1	7	14.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	583200	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	580359	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	580978	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	580677	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	580674	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	580675	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	583375	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	580676	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	581018	1	21	4.7	5.0	×
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	582926	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	580360	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*
Matrix Spikes (MS) - Continued							
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	581017	1	15	6.6	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2201982**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 26-Jul-2022 18:23
PO	: 1200-25.03.02	Date Analysis Commenced	: 28-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day2	Issue Date	: 06-Jun-2023 14:38
Sampler	: PAT BEAUPRE 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta

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: 580689)											
CG2209853-001	Anonymous	pH	----	E108	0.10	pH units	7.50	7.55	0.664%	4%	----
Physical Tests (QC Lot: 580690)											
CG2209853-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	931	923	0.863%	10%	----
Physical Tests (QC Lot: 580691)											
CG2209853-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	234	236	0.809%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	234	236	0.809%	20%	----
Physical Tests (QC Lot: 581026)											
CG2209906-012	Anonymous	Solids, total dissolved [TDS]	----	E162	40	mg/L	3560	3580	0.673%	20%	----
Physical Tests (QC Lot: 581060)											
CG2209916-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	13.7	16.3	2.6	Diff <2x LOR	----
Physical Tests (QC Lot: 581691)											
CG2209947-001	Anonymous	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 580674)											
FJ2201982-001	PR1	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0700	0.0672	4.08%	20%	----
Anions and Nutrients (QC Lot: 580675)											
FJ2201982-001	PR1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 580676)											
FJ2201982-001	PR1	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.2	14.0	1.49%	20%	----
Anions and Nutrients (QC Lot: 580677)											
FJ2201982-001	PR1	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.035	0.034	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 580678)											
FJ2201982-001	PR1	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 580978)											
CG2209906-010	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0721	0.0721	0.0277%	20%	----
Anions and Nutrients (QC Lot: 581017)											
EO2205875-005	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0665	0.0668	0.418%	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*
Anions and Nutrients (QC Lot: 581018)											
CG2209891-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0569	0.0611	7.13%	20%	----
Anions and Nutrients (QC Lot: 581019)											
FJ2201982-005	PC1	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 581149)											
CG2209933-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0069	0.0062	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582926)											
CG2209919-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.360	0.355	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 583375)											
FJ2201963-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.30	3.30	0.002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 580359)											
FJ2201982-001	PR1	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.94	2.65	0.28	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 580360)											
FJ2201982-001	PR1	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.54	2.60	0.06	Diff <2x LOR	----
Dissolved Metals (QC Lot: 583200)											
CG2209958-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	87.7	86.6	1.22%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	72.4	72.4	0.0832%	20%	----

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: 580690)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 580691)						
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: 581026)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 581060)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 581691)						
Colour, true	----	E329	5	CU	<5.0	----
Anions and Nutrients (QCLot: 580674)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 580675)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 580676)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 580677)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 580678)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 580978)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 581017)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 581018)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 581019)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 581149)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 581149) - continued						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 582926)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 583375)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 580359)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 580360)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 583200)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 580689)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 580690)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	103	90.0	110	----
Physical Tests (QCLot: 580691)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	98.1	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 581026)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	96.2	85.0	115	----
Physical Tests (QCLot: 581060)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.4	85.0	115	----
Physical Tests (QCLot: 581691)									
Colour, true	----	E329	5	CU	100 CU	96.9	85.0	115	----
Anions and Nutrients (QCLot: 580674)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 580675)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 580676)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 580677)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 580678)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.2	90.0	110	----
Anions and Nutrients (QCLot: 580978)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 581017)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	116	80.0	120	----
Anions and Nutrients (QCLot: 581018)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	107	80.0	120	----
Anions and Nutrients (QCLot: 581019)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 581149)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 581149) - continued									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 582926)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 583375)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	102	85.0	115	----
Organic / Inorganic Carbon (QCLot: 580359)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 580360)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 583200)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	99.1	80.0	120	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 580674)										
FJ2201982-002	PR2	Nitrate (as N)	14797-55-8	E235.NO3-L	2.18 mg/L	2.5 mg/L	87.4	75.0	125	----
Anions and Nutrients (QCLot: 580675)										
FJ2201982-002	PR2	Nitrite (as N)	14797-65-0	E235.NO2-L	0.445 mg/L	0.5 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 580676)										
FJ2201982-002	PR2	Sulfate (as SO4)	14808-79-8	E235.SO4	86.9 mg/L	100 mg/L	86.9	75.0	125	----
Anions and Nutrients (QCLot: 580677)										
FJ2201982-002	PR2	Fluoride	16984-48-8	E235.F	0.891 mg/L	1 mg/L	89.1	75.0	125	----
Anions and Nutrients (QCLot: 580678)										
FJ2201982-002	PR2	Chloride	16887-00-6	E235.Cl	86.6 mg/L	100 mg/L	86.6	75.0	125	----
Anions and Nutrients (QCLot: 580978)										
CG2209906-011	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 581017)										
EO2205875-006	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.0676 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 581018)										
CG2209891-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0655 mg/L	0.0676 mg/L	96.9	70.0	130	----
Anions and Nutrients (QCLot: 581149)										
CG2209934-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 582926)										
CG2209925-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.56 mg/L	2.5 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 583375)										
FJ2201982-001	PR1	Silicate (as SiO2)	7631-86-9	E392	9.84 mg/L	10 mg/L	98.4	75.0	125	----
Organic / Inorganic Carbon (QCLot: 580359)										
FJ2201982-001	PR1	Carbon, dissolved organic [DOC]	----	E358-L	5.33 mg/L	5 mg/L	106	70.0	130	----
Organic / Inorganic Carbon (QCLot: 580360)										
FJ2201982-001	PR1	Carbon, total organic [TOC]	----	E355-L	5.93 mg/L	5 mg/L	119	70.0	130	----
Dissolved Metals (QCLot: 583200)										
CG2209958-002	Anonymous	Calcium, dissolved	7440-70-2	E421	41.3 mg/L	40 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: 583200) - continued										
CG2209958-002	Anonymous	Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-July-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report	Reports / Recipients		Turnaround Time (TAT) Requested
Company:	Ecofish Research Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	☑ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Leah Hull	Merge QC/QCI Reports with COA	☑ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
Phone:	250-334-3042	☑ 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:	600 Comox Rd.	Email 1 or Fax	lhull@ecofishresearch.com	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional
City/Province:	Courtenay, BC	Email 2	tkasubuchi@ecofishresearch.com	☑ fees may apply to rush requests on weekends, statutory holidays and non-routine tests
Postal Code:	V9N 3P6	Email 3	waterqualitylabdata@ecofishresearch.com	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	
Company:	Ecofish Research Ltd.	Email 1 or Fax	accountspayable@ecofishresearch.com	
Contact:	accountspayable@ecofishresearch.com	Email 2		

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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 CONTAINER:	Alk., Ec, pH, TDS, TSS, Anions, pkg, Si, diss orthophosphate,	Chlorophyll-a by fluorometry	DOC; Total dissolved P	Hardness	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P										SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
						F/P	P	P														
	PR1	26 JUL 22	09:27	Water		R		R	R	R												
	PR2	26 JUL 22	16:20	Water		R		R	R	R												
	HD	26 JUL 22	16:57	Water		R		R	R	R												
PR3	PR~~2.01~~	26 JUL 22	13:10	Water		R		R	R	R												
	PC1	26 JUL 22	10:15	Water		R		R	R	R												

Fort St. John
Work Order Reference
FJ2201982

Telephone : +1 250 261 551.

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	****Low level Hg for total and dissolved. Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
10 c							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: July 26, 2022	Time:	Received by:	Date: July 26 22	Time: 6:15	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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202006**	Page	: 1 of 6
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9- Day 3	Issue Date	: 22-Aug-2022 17:02
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta

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 Unit
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA	PD2-A	PD2-B	PINE-A	PINE-B
					Client sampling date / time	27-Jul-2022 11:55	27-Jul-2022 11:15	27-Jul-2022 11:15	27-Jul-2022 10:10	27-Jul-2022 10:10
						FJ2202006-001	FJ2202006-002	FJ2202006-003	FJ2202006-004	FJ2202006-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		63.1	88.3	95.2	120	122
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		63.1	88.3	95.2	120	122
colour, true	----	E329	5.0	CU		203	6.3	6.5	<5.0	5.1
conductivity	----	E100	2.0	µS/cm		185	196	197	233	234
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		81.8	105	105	126	126
pH	----	E108	0.10	pH units		7.80	8.09	8.11	8.26	8.26
solids, total dissolved [TDS]	----	E162	10	mg/L		213	137	142	158	151
solids, total suspended [TSS]	----	E160	3.0	mg/L		19.7	88.7	94.1	19.1	12.7
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0323	0.0063	0.0058	0.0067	<0.0050
chloride	16887-00-6	E235.Cl	0.50	mg/L		0.65	<0.50	<0.50	0.65	0.61
fluoride	16984-48-8	E235.F	0.020	mg/L		0.092	0.043	0.044	0.054	0.053
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.510	0.209	0.213	0.340	0.055
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		<0.0050	0.0532	0.0613	0.0225	0.0168
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.510	0.262	0.274	0.362	0.072
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0041	<0.0010	<0.0010	<0.0010	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0703	0.102 DLHC	0.0935	0.0214	0.0139
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0124	<0.0020	<0.0020	<0.0020	<0.0020
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		5.78	4.36	4.32	2.18	2.17
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		33.4	16.4	16.2	14.0	13.7
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		32.7	2.70	2.55	1.75	1.48
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		35.9	2.56	2.44	2.83	1.58
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		23.1	30.2	30.3	36.4	36.4
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		5.87	7.10	7.07	8.60	8.62
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD1	PD1-FB	----	----	----
					Client sampling date / time	27-Jul-2022 09:23	27-Jul-2022 09:23	----	----	----
						FJ2202006-006	FJ2202006-007	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		98.4	<1.0	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		98.4	<1.0	----	----	----
colour, true	----	E329	5.0	CU		6.7	<5.0	----	----	----
conductivity	----	E100	2.0	µS/cm		196	<2.0	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		103	<0.50	----	----	----
pH	----	E108	0.10	pH units		8.09	5.37	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		138	<10	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		78.3	<3.0	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0069	<0.0050	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.042	<0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.158	<0.050	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0607	<0.0050	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.219	<0.050	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.101 DLHC	<0.0020	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	<0.0020	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.38	<0.50	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		15.8	<0.30	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.50	<0.50	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.62	<0.50	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		29.8	<0.050	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.92	<0.0050	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202006**	Page	: 1 of 23
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Issue Date	: 22-Aug-2022 17:02
C-O-C number	: 2022-July-MON8/9- Day 3		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEA	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD1	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD1-FB	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2-A	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2-B	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PINE-A	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PINE-B	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE BEA	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD1	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD1-FB	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2-A	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2-B	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE-A	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE-B	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1-FB	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2-A	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2-B	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE-A	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE-B	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1-FB	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2-A	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2-B	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE-A	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE-B	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1-FB	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2-A	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2-B	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PINE-A	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PINE-B	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE BEA	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1-FB	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2-A	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2-B	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE-A	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE-B	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE BEA	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1-FB	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD2-A	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD2-B	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PINE-A	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PINE-B	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1-FB	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2-A	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2-B	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE-A	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE-B	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1-FB	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2-A	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PD2-B	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PINE-A	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PINE-B	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BEA	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD1	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD1-FB	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD2-A	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD2-B	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PINE-A	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PINE-B	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
BEA	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD1	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD1-FB	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD2-A	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD2-B	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PINE-A	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PINE-B	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
BEA	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PD1	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PD1-FB	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PD2-A	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PD2-B	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PINE-A	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
PINE-B	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
BEA	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD1	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD1-FB	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2-A	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2-B	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE-A	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE-B	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1-FB	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2-A	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2-B	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PINE-A	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PINE-B	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1-FB	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2-A	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2-B	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PINE-A	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PINE-B	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE BEA	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1-FB	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2-A	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2-B	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PINE-A	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PINE-B	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD1	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PD1-FB	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2-A	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2-B	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE-A	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE-B	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE BEA	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PD1	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PD1-FB	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PD2-A	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD2-B	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE-A	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE-B	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD1	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD1-FB	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2-A	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2-B	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PINE-A	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 PINE-B	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1-FB	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2-A	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2-B	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE-A	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE-B	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 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	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	2	26	7.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584116	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	2	34	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	2	26	7.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584116	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	2	34	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	2	26	7.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	2	26	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	2	34	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	2	26	7.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202006**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9- Day 3	Issue Date	: 22-Aug-2022 17:02
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta

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: 582936)											
CG2209970-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 583077)											
CG2210014-006	Anonymous	solids, total dissolved [TDS]	----	E162	40	mg/L	3090	3140	1.54%	20%	----
Physical Tests (QC Lot: 583078)											
FJ2202006-003	PD2-B	solids, total dissolved [TDS]	----	E162	20	mg/L	142	156	14	Diff <2x LOR	----
Physical Tests (QC Lot: 584114)											
CG2209982-017	Anonymous	conductivity	----	E100	2.0	µS/cm	5750	5770	0.347%	10%	----
Physical Tests (QC Lot: 584115)											
CG2209982-018	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	488	536	9.53%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	488	536	9.53%	20%	----
Physical Tests (QC Lot: 584116)											
FJ2202005-002	Anonymous	pH	----	E108	0.10	pH units	8.63	8.61	0.232%	4%	----
Physical Tests (QC Lot: 584131)											
CG2210001-005	Anonymous	solids, total suspended [TSS]	----	E160	5.0	mg/L	2720	2350	14.6%	20%	----
Physical Tests (QC Lot: 584132)											
FJ2202006-007	PD1-FB	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582531)											
FJ2202005-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0585	0.0489	17.9%	20%	----
Anions and Nutrients (QC Lot: 582532)											
FJ2202005-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	16.4	16.3	0.651%	20%	----
Anions and Nutrients (QC Lot: 582533)											
FJ2202005-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582534)											
FJ2202005-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.044	0.044	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582535)											
FJ2202005-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582845)											
CG2209997-004	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	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*
Anions and Nutrients (QC Lot: 582846)											
FJ2202006-003	PD2-B	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582955)											
FJ2202005-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.132	0.126	4.99%	20%	----
Anions and Nutrients (QC Lot: 583199)											
CG2209965-021	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.90	3.89	0.280%	20%	----
Anions and Nutrients (QC Lot: 583316)											
FJ2202005-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.197	0.162	0.034	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 584342)											
CG2209973-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.42	6.40	0.379%	20%	----
Anions and Nutrients (QC Lot: 584502)											
CG2209973-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0203	0.0203	0.118%	20%	----
Organic / Inorganic Carbon (QC Lot: 582716)											
FJ2202005-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.66	2.68	0.01	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 582717)											
FJ2202005-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.15	3.20	0.05	Diff <2x LOR	----
Dissolved Metals (QC Lot: 588944)											
FJ2202005-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	30.4	30.4	0.0604%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.14	7.05	1.24%	20%	----

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: 582936)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 583077)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 583078)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 584114)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 584115)						
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: 584131)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 584132)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 582531)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 582532)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 582533)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582534)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 582535)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 582845)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582846)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582955)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 583199)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 583316)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 584342)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 584502)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 582716)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 582717)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 588944)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 582936)									
colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 583077)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
Physical Tests (QCLot: 583078)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.2	85.0	115	----
Physical Tests (QCLot: 584114)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 584115)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	106	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 584116)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 584131)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.2	85.0	115	----
Physical Tests (QCLot: 584132)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	93.3	85.0	115	----
Anions and Nutrients (QCLot: 582531)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 582532)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 582533)									
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: 582534)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 582535)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 582845)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 582846)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 582955)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	103	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 583199)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.7	85.0	115	----
Anions and Nutrients (QCLot: 583316)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 584342)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 584502)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	84.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582716)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582717)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 588944)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.6	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: 582531)										
FJ2202006-007	PD1-FB	nitrate (as N)	14797-55-8	E235.NO3-L	2.18 mg/L	2.5 mg/L	87.4	75.0	125	----
Anions and Nutrients (QCLot: 582532)										
FJ2202006-007	PD1-FB	sulfate (as SO4)	14808-79-8	E235.SO4	88.8 mg/L	100 mg/L	88.8	75.0	125	----
Anions and Nutrients (QCLot: 582533)										
FJ2202006-007	PD1-FB	nitrite (as N)	14797-65-0	E235.NO2-L	0.442 mg/L	0.5 mg/L	88.4	75.0	125	----
Anions and Nutrients (QCLot: 582534)										
FJ2202006-007	PD1-FB	fluoride	16984-48-8	E235.F	0.889 mg/L	1 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 582535)										
FJ2202006-007	PD1-FB	chloride	16887-00-6	E235.Cl	87.2 mg/L	100 mg/L	87.2	75.0	125	----
Anions and Nutrients (QCLot: 582845)										
CG2209998-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0487 mg/L	0.05 mg/L	97.5	70.0	130	----
Anions and Nutrients (QCLot: 582846)										
FJ2202006-004	PINE-A	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0496 mg/L	0.05 mg/L	99.3	70.0	130	----
Anions and Nutrients (QCLot: 582955)										
FJ2202005-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0647 mg/L	0.0676 mg/L	95.7	70.0	130	----
Anions and Nutrients (QCLot: 583199)										
CG2209965-022	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 583316)										
FJ2202005-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 584342)										
FJ2202005-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.93 mg/L	10 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 584502)										
FJ2202005-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0639 mg/L	0.0676 mg/L	94.6	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582716)										
FJ2202005-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.37 mg/L	5 mg/L	107	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582717)										
FJ2202005-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.73 mg/L	5 mg/L	114	70.0	130	----
Dissolved Metals (QCLot: 588944)										

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: 588944) - continued										
FJ2202005-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-July-MON8/9- Day 3

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

ALS Lab Work Order # (ALS use only):

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

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

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	BEA	27-JUL-22	11:55	Water		R		R	R	R			
	PD2-A	27-JUL-22	11:15	Water		R		R	R	R			
	PD2-B	27-JUL-22	11:15	Water		R		R	R	R			
	PINE- A	27-JUL-22	10:10	Water		R		R	R	R			
	PINE-B	27-JUL-22	10:10	Water		R		R	R	R			
	PD1	27-JUL-22	9:33	Water		R		R	R	R			
	PD1- FB	27-JUL-22	9:23	Water		R		R	R	R			
			9:23										

Fort St. John Work Order Reference FJ220206

Telephone : +1 250 261 5511

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
5.3							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	27-JUL-22	5:16

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202005**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day3B/4B	Issue Date	: 22-Aug-2022 17:01
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta

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 Unit
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD3	KR	PD4	POUCE	----
					Client sampling date / time	27-Jul-2022 12:35	27-Jul-2022 13:05	27-Jul-2022 13:55	27-Jul-2022 14:40	----
						FJ2202005-001	FJ2202005-002	FJ2202005-003	FJ2202005-004	--------
						Result	Result	Result	Result	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		96.1	205	97.6	213	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	23.0	<1.0	22.4	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	11.5	<1.0	11.2	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		96.1	228	97.6	235	----
colour, true	----	E329	5.0	CU		9.3	20.5	9.8	29.5	----
conductivity	----	E100	2.0	µS/cm		201	411	207	893	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		105	206	108	369	----
pH	----	E108	0.10	pH units		8.10	8.63	8.15	8.57	----
solids, total dissolved [TDS]	----	E162	10	mg/L		145	287	145	685	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		96.1	19.3	83.3	5.3	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	0.0101	0.0092	0.0135	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	1.36	<0.50	14.1	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.044	0.103	0.046	0.245	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.197	0.424	0.204	0.803	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0585	<0.0050	0.0435	<0.0050	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.256	0.424	0.248	0.803	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.132 DLHC	0.0269	0.0890	0.0186	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	0.0024	0.0025	0.0069	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.20	4.09	4.09	0.76	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		16.4	24.1	17.0	252	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.66	10.4	3.73	19.2	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		3.15	11.4	3.17	20.3	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		30.4	56.7	31.2	96.3	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		7.14	15.7	7.33	31.2	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202005**	Page	: 1 of 17
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Issue Date	: 22-Aug-2022 17:01
C-O-C number	: 2022-July-MON8/9-Day3B/4B		
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) KR	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD3	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD4	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) POUCE	E298	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE KR	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD3	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD4	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE POUCE	E235.Cl	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE KR	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD3	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD4	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE POUCE	E378-U	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE KR	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD3	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD4	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE POUCE	E235.F	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE KR	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD3	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD4	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE POUCE	E235.NO3-L	27-Jul-2022	29-Jul-2022	3 days	2 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE KR	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD3	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD4	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE POUCE	E235.NO2-L	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE KR	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PD3	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD4	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE POUCE	E392	27-Jul-2022	----	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE KR	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD3	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD4	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE POUCE	E235.SO4	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) KR	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD3	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD4	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) POUCE	E375-T	27-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) KR	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD3	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD4	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) POUCE	E318	27-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) KR	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD3	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD4	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) POUCE	E372-U	27-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) KR	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD3	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD4	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) POUCE	E421	27-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) KR	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD3	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD4	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) POUCE	E358-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KR	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD3	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD4	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) POUCE	E355-L	27-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KR	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD3	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD4	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE POUCE	E290	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KR	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PD3	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD4	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE POUCE	E329	27-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE KR	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD3	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD4	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE POUCE	E100	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE KR	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD3	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD4	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE POUCE	E108	27-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE KR	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD3	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD4	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE POUCE	E162	27-Jul-2022	----	----	----		02-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE KR	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD3	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD4	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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	
Physical Tests : TSS by Gravimetry										
HDPE										
POUCE	E160	27-Jul-2022	----	----	----		01-Aug-2022	7 days	5 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	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584111	2	32	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584111	2	32	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583077	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584131	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582845	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202005**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 27-Jul-2022 17:16
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day3B/4B	Issue Date	: 22-Aug-2022 17:01
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta

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: 582936)											
CG2209970-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 583077)											
CG2210014-006	Anonymous	solids, total dissolved [TDS]	----	E162	40	mg/L	3090	3140	1.54%	20%	----
Physical Tests (QC Lot: 584111)											
CG2209972-001	Anonymous	pH	----	E108	0.10	pH units	7.72	7.78	0.774%	4%	----
Physical Tests (QC Lot: 584114)											
CG2209982-017	Anonymous	conductivity	----	E100	2.0	µS/cm	5750	5770	0.347%	10%	----
Physical Tests (QC Lot: 584115)											
CG2209982-018	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	488	536	9.53%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	488	536	9.53%	20%	----
Physical Tests (QC Lot: 584116)											
FJ2202005-002	KR	pH	----	E108	0.10	pH units	8.63	8.61	0.232%	4%	----
Physical Tests (QC Lot: 584131)											
CG2210001-005	Anonymous	solids, total suspended [TSS]	----	E160	5.0	mg/L	2720	2350	14.6%	20%	----
Anions and Nutrients (QC Lot: 582531)											
FJ2202005-001	PD3	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0585	0.0489	17.9%	20%	----
Anions and Nutrients (QC Lot: 582532)											
FJ2202005-001	PD3	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	16.4	16.3	0.651%	20%	----
Anions and Nutrients (QC Lot: 582533)											
FJ2202005-001	PD3	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582534)											
FJ2202005-001	PD3	fluoride	16984-48-8	E235.F	0.020	mg/L	0.044	0.044	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582535)											
FJ2202005-001	PD3	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582845)											
CG2209997-004	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582955)											
FJ2202005-001	PD3	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.132	0.126	4.99%	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*
Anions and Nutrients (QC Lot: 583199)											
CG2209965-021	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.90	3.89	0.280%	20%	----
Anions and Nutrients (QC Lot: 583316)											
FJ2202005-001	PD3	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.197	0.162	0.034	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 584342)											
CG2209973-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.42	6.40	0.379%	20%	----
Anions and Nutrients (QC Lot: 584502)											
CG2209973-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0203	0.0203	0.118%	20%	----
Organic / Inorganic Carbon (QC Lot: 582716)											
FJ2202005-001	PD3	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.66	2.68	0.01	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 582717)											
FJ2202005-001	PD3	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.15	3.20	0.05	Diff <2x LOR	----
Dissolved Metals (QC Lot: 588944)											
FJ2202005-001	PD3	calcium, dissolved	7440-70-2	E421	0.050	mg/L	30.4	30.4	0.0604%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.14	7.05	1.24%	20%	----

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: 582936)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 583077)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 584114)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 584115)						
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: 584131)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 582531)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 582532)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 582533)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582534)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 582535)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 582845)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582955)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 583199)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 583316)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 584342)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 584502)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 582716)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 582717)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 588944)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 582936)									
colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 583077)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	100	85.0	115	----
Physical Tests (QCLot: 584111)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 584114)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 584115)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	106	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 584116)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 584131)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.2	85.0	115	----
Anions and Nutrients (QCLot: 582531)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 582532)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 582533)									
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: 582534)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 582535)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 582845)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 582955)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 583199)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.7	85.0	115	----
Anions and Nutrients (QCLot: 583316)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 584342)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 584502)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	84.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582716)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582717)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 588944)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.6	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: 582531)										
FJ2202006-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.18 mg/L	2.5 mg/L	87.4	75.0	125	----
Anions and Nutrients (QCLot: 582532)										
FJ2202006-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	88.8 mg/L	100 mg/L	88.8	75.0	125	----
Anions and Nutrients (QCLot: 582533)										
FJ2202006-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.442 mg/L	0.5 mg/L	88.4	75.0	125	----
Anions and Nutrients (QCLot: 582534)										
FJ2202006-007	Anonymous	fluoride	16984-48-8	E235.F	0.889 mg/L	1 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 582535)										
FJ2202006-007	Anonymous	chloride	16887-00-6	E235.Cl	87.2 mg/L	100 mg/L	87.2	75.0	125	----
Anions and Nutrients (QCLot: 582845)										
CG2209998-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0487 mg/L	0.05 mg/L	97.5	70.0	130	----
Anions and Nutrients (QCLot: 582955)										
FJ2202005-002	KR	phosphorus, total	7723-14-0	E372-U	0.0647 mg/L	0.0676 mg/L	95.7	70.0	130	----
Anions and Nutrients (QCLot: 583199)										
CG2209965-022	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 583316)										
FJ2202005-002	KR	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 584342)										
FJ2202005-001	PD3	silicate (as SiO2)	7631-86-9	E392	9.93 mg/L	10 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 584502)										
FJ2202005-001	PD3	phosphorus, total dissolved	7723-14-0	E375-T	0.0639 mg/L	0.0676 mg/L	94.6	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582716)										
FJ2202005-001	PD3	carbon, dissolved organic [DOC]	----	E358-L	5.37 mg/L	5 mg/L	107	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582717)										
FJ2202005-001	PD3	carbon, total organic [TOC]	----	E355-L	5.73 mg/L	5 mg/L	114	70.0	130	----
Dissolved Metals (QCLot: 588944)										
FJ2202005-002	KR	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-July-MON8/9- Day 4 B

3B/

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
  Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests
- ☑ fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	PD3	27-JUL-22	12:35	Water		R		R	R	R			
	KR	27-JUL-22	13:05	Water		R		R	R	R			
	PD4	27-JUL-22	15:56	Water		R		R	R	R			
	POUCE	27-JUL-22	14:40	Water		R		R	R	R			

Fort St. John
Work Order Reference
FJ220005

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System?
☐ YES ☑ NO

Are samples for human consumption/ use?
☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
18.6							

SHIPMENT RELEASE (client use)

Released by: Date: July 28 2022 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: 7-27-22 Time: 5:16

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202009**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jul-2022 12:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 4	Issue Date	: 22-Aug-2022 17:05
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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*
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sara Niroomand		Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
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*
-	No Unit
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD5	----	----	----	----
					Client sampling date / time	28-Jul-2022 09:45	----	----	----	----
						FJ2202009-001	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		93.4	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		93.4	----	----	----	----
colour, true	----	E329	5.0	CU		9.1	----	----	----	----
conductivity	----	E100	2.0	µS/cm		201	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		108	----	----	----	----
pH	----	E108	0.10	pH units		8.13	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		135	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		41.7	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.046	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.152	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0484	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	----	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.200	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0626	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.04	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		16.0	----	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.97	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.93	----	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		31.2	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		7.30	----	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202009**	Page	: 1 of 10
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jul-2022 12:00
PO	: 1200-25.03.02	Issue Date	: 22-Aug-2022 17:05
C-O-C number	: 2022-July-MON8/9-Day 4		
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5	E298	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5	E235.Cl	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5	E378-U	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5	E235.F	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5	E235.NO3-L	28-Jul-2022	29-Jul-2022	3 days	1 days	✓	29-Jul-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD5	E235.NO2-L	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	1 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD5	E392	28-Jul-2022	----	----	----		31-Jul-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5	E235.SO4	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD5	E375-T	28-Jul-2022	02-Aug-2022	----	----		02-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD5	E318	28-Jul-2022	31-Jul-2022	----	----		31-Jul-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD5	E372-U	28-Jul-2022	29-Jul-2022	----	----		31-Jul-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD5	E421	28-Jul-2022	04-Aug-2022	----	----		04-Aug-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD5	E358-L	28-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD5	E355-L	28-Jul-2022	29-Jul-2022	----	----		30-Jul-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD5	E290	28-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD5	E329	28-Jul-2022	29-Jul-2022	----	----		29-Jul-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PD5	E100	28-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE PD5	E108	28-Jul-2022	30-Jul-2022	----	----		30-Jul-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PD5	E162	28-Jul-2022	----	----	----		02-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD5	E160	28-Jul-2022	----	----	----		01-Aug-2022	7 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	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582846	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584116	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583078	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584132	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582846	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
pH by Meter	E108	584116	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583078	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584132	1	14	7.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	584115	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	582936	1	13	7.6	5.0	✓
Conductivity in Water	E100	584114	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582846	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	583078	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	584132	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	583199	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	582535	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	588944	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	582716	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	582846	1	6	16.6	5.0	✓
Fluoride in Water by IC	E235.F	582534	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	582531	1	13	7.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	582533	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	584342	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	582532	1	12	8.3	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	584502	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	583316	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	582717	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	582955	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202009**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 28-Jul-2022 12:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 29-Jul-2022
C-O-C number	: 2022-July-MON8/9-Day 4	Issue Date	: 22-Aug-2022 17:05
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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*
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Metals, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
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: 582936)											
CG2209970-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 583078)											
FJ2202006-003	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	142	156	14	Diff <2x LOR	----
Physical Tests (QC Lot: 584114)											
CG2209982-017	Anonymous	conductivity	----	E100	2.0	µS/cm	5750	5770	0.347%	10%	----
Physical Tests (QC Lot: 584115)											
CG2209982-018	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	488	536	9.53%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	488	536	9.53%	20%	----
Physical Tests (QC Lot: 584116)											
FJ2202005-002	Anonymous	pH	----	E108	0.10	pH units	8.63	8.61	0.232%	4%	----
Physical Tests (QC Lot: 584132)											
FJ2202006-007	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582531)											
FJ2202005-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0585	0.0489	17.9%	20%	----
Anions and Nutrients (QC Lot: 582532)											
FJ2202005-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	16.4	16.3	0.651%	20%	----
Anions and Nutrients (QC Lot: 582533)											
FJ2202005-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582534)											
FJ2202005-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.044	0.044	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582535)											
FJ2202005-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582846)											
FJ2202006-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 582955)											
FJ2202005-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.132	0.126	4.99%	20%	----
Anions and Nutrients (QC Lot: 583199)											
CG2209965-021	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.90	3.89	0.280%	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*
Anions and Nutrients (QC Lot: 583316)											
FJ2202005-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.197	0.162	0.034	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 584342)											
CG2209973-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.42	6.40	0.379%	20%	----
Anions and Nutrients (QC Lot: 584502)											
CG2209973-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0203	0.0203	0.118%	20%	----
Organic / Inorganic Carbon (QC Lot: 582716)											
FJ2202005-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.66	2.68	0.01	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 582717)											
FJ2202005-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.15	3.20	0.05	Diff <2x LOR	----
Dissolved Metals (QC Lot: 588944)											
FJ2202005-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	30.4	30.4	0.0604%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.14	7.05	1.24%	20%	----

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: 582936)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 583078)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 584114)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 584115)						
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: 584132)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 582531)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 582532)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 582533)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582534)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 582535)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 582846)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 582955)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 583199)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 583316)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 584342)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 584502)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 582716)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 582717)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 588944)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 582936)									
colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 583078)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	99.2	85.0	115	----
Physical Tests (QCLot: 584114)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.9	90.0	110	----
Physical Tests (QCLot: 584115)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	106	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 584116)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 584132)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	93.3	85.0	115	----
Anions and Nutrients (QCLot: 582531)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 582532)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 582533)									
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: 582534)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 582535)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 582846)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 582955)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 583199)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.7	85.0	115	----
Anions and Nutrients (QCLot: 583316)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 584342)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	102	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 584502)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	84.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582716)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 582717)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	104	80.0	120	----
Dissolved Metals (QCLot: 588944)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.6	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: 582531)										
FJ2202006-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.18 mg/L	2.5 mg/L	87.4	75.0	125	----
Anions and Nutrients (QCLot: 582532)										
FJ2202006-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	88.8 mg/L	100 mg/L	88.8	75.0	125	----
Anions and Nutrients (QCLot: 582533)										
FJ2202006-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.442 mg/L	0.5 mg/L	88.4	75.0	125	----
Anions and Nutrients (QCLot: 582534)										
FJ2202006-007	Anonymous	fluoride	16984-48-8	E235.F	0.889 mg/L	1 mg/L	88.9	75.0	125	----
Anions and Nutrients (QCLot: 582535)										
FJ2202006-007	Anonymous	chloride	16887-00-6	E235.Cl	87.2 mg/L	100 mg/L	87.2	75.0	125	----
Anions and Nutrients (QCLot: 582846)										
FJ2202006-004	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0496 mg/L	0.05 mg/L	99.3	70.0	130	----
Anions and Nutrients (QCLot: 582955)										
FJ2202005-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0647 mg/L	0.0676 mg/L	95.7	70.0	130	----
Anions and Nutrients (QCLot: 583199)										
CG2209965-022	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 583316)										
FJ2202005-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 584342)										
FJ2202005-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.93 mg/L	10 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 584502)										
FJ2202005-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0639 mg/L	0.0676 mg/L	94.6	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582716)										
FJ2202005-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.37 mg/L	5 mg/L	107	70.0	130	----
Organic / Inorganic Carbon (QCLot: 582717)										
FJ2202005-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.73 mg/L	5 mg/L	114	70.0	130	----
Dissolved Metals (QCLot: 588944)										
FJ2202005-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-July-MON8/9- Day 4

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions pkg, Si, diss orthophosphate,	Chlorophyll-a by fluorometry	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes
	PD5	26-JUL-22	9:45	Water		R		R	R	R			

Fort St. John
Work Order Reference
FJ2202009

Telephone : +1 250 261 6517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

****Low level Hg for total and dissolved.

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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		
13.7					

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	July 28 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
RICK	7.28.22	11:55

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202155**	Page	: 1 of 5
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 16-Aug-2022 12:55
PO	: 1200-25.03.02	Date Analysis Commenced	: 17-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day 1	Issue Date	: 10-May-2023 15:53
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Amber Montgomery	Account Manager Assistant	Administration, Calgary, Alberta
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
L	litres
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

Amendment (10/5/2023): This report has been amended and re-released to allow the reporting of additional analytical data. Adding ug/L calculation for Chlorophyll-a.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
					Client sampling date / time	16-Aug-2022 08:35	16-Aug-2022 07:50	16-Aug-2022 11:00	16-Aug-2022 10:20	16-Aug-2022
						FJ2202155-001	FJ2202155-002	FJ2202155-003	FJ2202155-004	FJ2202155-005
						Result	Result	Result	Result	Result
Sample Preparation										
Volume filtered	----	EF870B	0.001	L		0.070	0.070	0.070	0.070	0.070
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		80.1	82.7	83.1	85.7	----
Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		80.1	82.7	83.1	85.7	----
Colour, true	----	E329	5.0	CU		6.9	7.1	8.6	6.9	----
Conductivity	----	E100	2.0	µS/cm		166	166	174	167	----
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L		84.2	89.6	90.4	92.0	----
pH	----	E108	0.10	pH units		8.20	8.20	8.13	8.09	----
Solids, total dissolved [TDS]	----	E162	10	mg/L		105	104	107	108	----
Solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	<3.0	<3.0	<3.0	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0140	0.0075	0.0064	0.0056	----
Chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	----
Fluoride	16984-48-8	E235.F	0.020	mg/L		0.026	0.026	0.028	0.026	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.072	0.131	<0.050	<0.050	----
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0550	0.0553	0.0704	0.0729	----
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	<0.0010	0.0018	0.0022	----
Nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.127	0.186	0.072	0.075	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0053	0.0045	0.0045	0.0053	----
Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.28	4.28	4.48	4.46	----
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		12.3	12.3	13.3	13.6	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		3.18	2.73	2.78	3.29	----
Carbon, total organic [TOC]	----	E355-L	0.50	mg/L		3.08	2.90	3.10	2.82	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-Shallow	W1-Deep	D1-Shallow	D1-Deep	Travel Blank
					Client sampling date / time	16-Aug-2022 08:35	16-Aug-2022 07:50	16-Aug-2022 11:00	16-Aug-2022 10:20	16-Aug-2022
						FJ2202155-001	FJ2202155-002	FJ2202155-003	FJ2202155-004	FJ2202155-005
						Result	Result	Result	Result	Result
Ion Balance										
Anion sum	----	EC101	0.10	meq/L		1.86	1.91	1.94	2.00	----
Cation sum	----	EC101	0.10	meq/L		1.74	1.85	1.87	1.90	----
Ion balance (APHA)	----	EC101	0.010	%		3.33	1.60	1.84	2.56	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421	0.050	mg/L		24.2	25.7	25.8	26.1	----
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		5.77	6.18	6.30	6.52	----
Dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	----
Plant Pigments										
Chlorophyll a	479-61-8	EC870B	0.010	µg/L		1.03	1.23	0.366	0.461	<0.028
Chlorophyll a	479-61-8	E870B	0.0020	µg/sample		0.0724	0.0862	0.0256	0.0323	<0.0020

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

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202155**	Page	: 1 of 20
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 16-Aug-2022 12:55
PO	: 1200-25.03.02	Issue Date	: 10-May-2023 15:52
C-O-C number	: 2022-Aug-MON8/9-Day 1		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Deep	E298	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-Shallow	E298	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Deep	E298	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-Shallow	E298	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Deep	E235.Cl	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-Shallow	E235.Cl	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-Deep	E235.Cl	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE W1-Shallow	E235.Cl	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Deep	E378-U	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-Shallow	E378-U	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Deep	E378-U	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-Shallow	E378-U	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Deep	E235.F	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-Shallow	E235.F	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Deep	E235.F	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-Shallow	E235.F	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO3-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO3-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO3-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO3-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Deep	E235.NO2-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-Shallow	E235.NO2-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Deep	E235.NO2-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-Shallow	E235.NO2-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE D1-Deep	E392	16-Aug-2022	----	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-Shallow	E392	16-Aug-2022	----	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-Deep	E392	16-Aug-2022	----	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-Shallow	E392	16-Aug-2022	----	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Deep	E235.SO4	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-Shallow	E235.SO4	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Deep	E235.SO4	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-Shallow	E235.SO4	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-Deep	E375-T	16-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
D1-Shallow	E375-T	16-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
W1-Shallow	E375-T	16-Aug-2022	17-Aug-2022	----	----		18-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-Deep	E375-T	16-Aug-2022	17-Aug-2022	3 days	1 days	✓	18-Aug-2022	28 days	1 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
D1-Deep	E318	16-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
D1-Shallow	E318	16-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
W1-Deep	E318	16-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
W1-Shallow	E318	16-Aug-2022	20-Aug-2022	----	----		20-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-Deep	E372-U	16-Aug-2022	17-Aug-2022	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-Shallow	E372-U	16-Aug-2022	17-Aug-2022	----	----		19-Aug-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) W1-Deep	E372-U	16-Aug-2022	17-Aug-2022	----	----		19-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) W1-Shallow	E372-U	16-Aug-2022	17-Aug-2022	----	----		19-Aug-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) D1-Shallow	E421	16-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) D1-Deep	E421	16-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) W1-Deep	E421	16-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) W1-Shallow	E421	16-Aug-2022	22-Aug-2022	----	----		23-Aug-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Deep	E358-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-Shallow	E358-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Deep	E358-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-Shallow	E358-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Deep	E355-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-Shallow	E355-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Deep	E355-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-Shallow	E355-L	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Deep	E290	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-Shallow	E290	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Deep	E290	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-Shallow	E290	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	14 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Deep	E329	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-Shallow	E329	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Deep	E329	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-Shallow	E329	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Deep	E100	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-Shallow	E100	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Deep	E100	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-Shallow	E100	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE D1-Deep	E108	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 D1-Shallow	E108	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Deep	E108	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-Shallow	E108	16-Aug-2022	17-Aug-2022	----	----		17-Aug-2022	0.25 hrs	0.26 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-Deep	E162	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-Shallow	E162	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Deep	E162	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-Shallow	E162	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Deep	E160	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-Shallow	E160	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE W1-Deep	E160	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-Shallow	E160	16-Aug-2022	----	----	----		19-Aug-2022	7 days	3 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE tube D1-Deep	E870B	16-Aug-2022	20-Aug-2022	28 days	4 days	✓	20-Aug-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE tube D1-Shallow	E870B	16-Aug-2022	20-Aug-2022	28 days	4 days	✓	20-Aug-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE tube Travel Blank	E870B	16-Aug-2022	20-Aug-2022	28 days	4 days	✓	20-Aug-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE tube W1-Deep	E870B	16-Aug-2022	20-Aug-2022	28 days	4 days	✓	20-Aug-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE tube W1-Shallow	E870B	16-Aug-2022	20-Aug-2022	28 days	4 days	✓	20-Aug-2022	28 days	0 days	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-Shallow	EF870B	16-Aug-2022	----	----	----		17-Aug-2022	48 hrs	28 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-Deep	EF870B	16-Aug-2022	----	----	----		17-Aug-2022	48 hrs	29 hrs	✓

Matrix: **Water**

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

Analyte Group / 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
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
Travel Blank	EF870B	16-Aug-2022	----	----	----		17-Aug-2022	48 hrs	30 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
W1-Shallow	EF870B	16-Aug-2022	----	----	----		17-Aug-2022	48 hrs	30 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE										
W1-Deep	EF870B	16-Aug-2022	----	----	----		17-Aug-2022	48 hrs	31 hrs	✓

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	606476	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	605988	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	606388	1	8	12.5	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	611401	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	606734	1	10	10.0	5.0	✓
Conductivity in Water	E100	606474	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613855	1	4	25.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605853	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	606247	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	606387	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	606384	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	606386	1	20	5.0	5.0	✓
pH by Meter	E108	606475	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	610871	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	606385	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	609058	1	14	7.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	606192	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	608825	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605854	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	606507	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	609064	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	606476	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	605988	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	606388	1	8	12.5	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	611401	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	606734	1	10	10.0	5.0	✓
Conductivity in Water	E100	606474	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613855	1	4	25.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605853	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	606247	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	606387	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	606384	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	606386	1	20	5.0	5.0	✓
pH by Meter	E108	606475	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	610871	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	606385	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	609058	1	14	7.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	606192	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	608825	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605854	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	606507	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	609064	1	17	5.8	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	606476	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	605988	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	606388	1	8	12.5	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	611401	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	606734	1	10	10.0	5.0	✓
Conductivity in Water	E100	606474	1	15	6.6	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613855	1	4	25.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605853	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	606247	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	606387	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	606384	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	606386	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	610871	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	606385	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	609058	1	14	7.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	606192	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	608825	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605854	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	606507	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	609064	1	17	5.8	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	605988	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	606388	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613855	1	4	25.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	605853	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	606247	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	606387	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	606384	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	606386	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	610871	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	606385	1	8	12.5	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*
Matrix Spikes (MS) - Continued							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	606192	1	17	5.8	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	608825	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	605854	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	606507	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B Vancouver - Environmental	Water	CALC	Convert results to sample concentration based on support lab filter information.
Chlorophyll-a Filtration by Support Laboratory	EF870B Calgary - Environmental	Water	EPA 445.0 (mod)	Filtration for chlorophyll-a analysis

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
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
	Vancouver - Environmental			
Chlorophyll-a Extraction	EP870 Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202155**	Page	: 1 of 10
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 16-Aug-2022 12:55
PO	: 1200-25.03.02	Date Analysis Commenced	: 17-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day 1	Issue Date	: 10-May-2023 15:53
Sampler	: ---- 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Amber Montgomery	Account Manager Assistant	Calgary Administration, Calgary, Alberta
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 606474)											
CG2210901-004	Anonymous	Conductivity	----	E100	2.0	µS/cm	333	335	0.599%	10%	----
Physical Tests (QC Lot: 606475)											
CG2210901-004	Anonymous	pH	----	E108	0.10	pH units	8.77	8.79	0.228%	4%	----
Physical Tests (QC Lot: 606476)											
CG2210901-004	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	136	141	3.75%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	16.0	17.2	7.23%	20%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	8.0	8.6	0.6	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	152	158	4.12%	20%	----
Physical Tests (QC Lot: 606734)											
CG2210845-001	Anonymous	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 609058)											
CG2210948-002	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	185	180	6	Diff <2x LOR	----
Physical Tests (QC Lot: 609064)											
FJ2202148-002	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	61.3	55.3	10.3%	20%	----
Anions and Nutrients (QC Lot: 605988)											
FJ2202151-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	2.50	mg/L	39.6	39.3	0.586%	20%	----
Anions and Nutrients (QC Lot: 606192)											
EO2206470-012	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0251	0.0251	0.240%	20%	----
Anions and Nutrients (QC Lot: 606247)											
CG2210887-015	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0100	mg/L	0.122	0.119	2.62%	20%	----
Anions and Nutrients (QC Lot: 606384)											
FJ2202154-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0730	0.0702	3.91%	20%	----
Anions and Nutrients (QC Lot: 606385)											
FJ2202154-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.4	13.4	0.00593%	20%	----
Anions and Nutrients (QC Lot: 606386)											
FJ2202154-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0018	0.0018	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 606387)											
FJ2202154-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.030	0.026	0.004	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*
Anions and Nutrients (QC Lot: 606388)											
FJ2202154-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 606507)											
FJ2202155-001	W1-Shallow	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0053	0.0045	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 608825)											
CG2210871-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	4.00	mg/L	44.3	44.1	0.366%	20%	----
Anions and Nutrients (QC Lot: 610871)											
FJ2202155-001	W1-Shallow	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.28	4.28	0.009	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 605853)											
FJ2202154-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.96	2.70	0.25	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 605854)											
FJ2202154-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.04	2.72	0.32	Diff <2x LOR	----
Dissolved Metals (QC Lot: 613855)											
FJ2202155-001	W1-Shallow	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	24.2	25.9	6.70%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.77	6.58	13.1%	20%	----
Plant Pigments (QC Lot: 611401)											
EO2206520-001	Anonymous	Chlorophyll a	479-61-8	E870B	0.0020	µg/sample	1.01	0.876	14.1%	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: 606474)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 606476)						
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: 606734)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 609058)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 609064)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 605988)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 606192)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 606247)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 606384)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 606385)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 606386)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 606387)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 606388)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 606507)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 608825)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 608825) - continued						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 610871)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 605853)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 605854)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 613855)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Plant Pigments (QCLot: 611401)						
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	<0.0020	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 606474)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 606475)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 606476)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	105	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 606734)									
Colour, true	----	E329	5	CU	100 CU	101	85.0	115	----
Physical Tests (QCLot: 609058)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.6	85.0	115	----
Physical Tests (QCLot: 609064)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.8	85.0	115	----
Anions and Nutrients (QCLot: 605988)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 606192)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	8.02 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 606247)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.02 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 606384)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 606385)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	109	90.0	110	----
Anions and Nutrients (QCLot: 606386)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 606387)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 606388)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 606507)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	8.02 mg/L	107	80.0	120	----
Anions and Nutrients (QCLot: 608825)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 608825) - continued									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 610871)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	98.0	85.0	115	----
Organic / Inorganic Carbon (QCLot: 605853)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	93.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 605854)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.2	80.0	120	----
Dissolved Metals (QCLot: 613855)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	93.2	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
Plant Pigments (QCLot: 611401)									
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	92.2	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: 605988)										
FJ2202152-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0966 mg/L	0.1 mg/L	96.6	75.0	125	----
Anions and Nutrients (QCLot: 606192)										
EO2206470-013	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0680 mg/L	0.0676 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 606247)										
CG2210887-016	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0496 mg/L	0.05 mg/L	99.1	70.0	130	----
Anions and Nutrients (QCLot: 606384)										
FJ2202154-003	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.46 mg/L	2.5 mg/L	98.6	75.0	125	----
Anions and Nutrients (QCLot: 606385)										
FJ2202154-003	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	107 mg/L	100 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 606386)										
FJ2202154-003	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.466 mg/L	0.5 mg/L	93.2	75.0	125	----
Anions and Nutrients (QCLot: 606387)										
FJ2202154-003	Anonymous	Fluoride	16984-48-8	E235.F	0.886 mg/L	1 mg/L	88.6	75.0	125	----
Anions and Nutrients (QCLot: 606388)										
FJ2202154-003	Anonymous	Chloride	16887-00-6	E235.Cl	98.3 mg/L	100 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 606507)										
FJ2202155-002	W1-Deep	Phosphorus, total	7723-14-0	E372-U	0.0598 mg/L	0.0676 mg/L	88.5	70.0	130	----
Anions and Nutrients (QCLot: 608825)										
CG2210893-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 610871)										
FJ2202155-002	W1-Deep	Silicate (as SiO2)	7631-86-9	E392	10.4 mg/L	10 mg/L	104	75.0	125	----
Organic / Inorganic Carbon (QCLot: 605853)										
FJ2202154-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.05 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 605854)										
FJ2202154-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.12 mg/L	5 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 613855)										
FJ2202155-002	W1-Deep	Calcium, dissolved	7440-70-2	E421	ND mg/L	4 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
Dissolved Metals (QCLot: 613855) - continued										
FJ2202155-002	W1-Deep	Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests
Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm
For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F)	Chlorophyll-a by fluorometry (F)	DOC, Total dissolved P (F/P)	Hardness (F/P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1-Shallow	16 AUG 22	08:35	Water	5	R	R	R	R	R	R			
	W1-Deep	16 AUG 22	07:50	Water	5	R	R	R	R	R	R			
	D1-Shallow	16 AUG 22	11:00	Water	5	R	R	R	R	R	R			
	D1-Deep	16 AUG 22	10:20	Water	5	R	R	R	R	R	R			
	Travel Blank	–	–	Water	1		R							

Fort St. John
Work Order Reference
FJ2202155

Telephone: +1 250 261 5517

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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	qmann@azimuthgroup.ca imcivor@azimuthgroup.ca
	Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
2.7							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Aug 16, 2022	Time:	Received by:	Date: 8-16-22	Time: 12:48	Received by:	Date:	Time:

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

AUG 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202203**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 07:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 20-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day 2	Issue Date	: 14-Sep-2022 16:39
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Courtney Cox	Analsyt	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	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*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: PR1	PC1	----	----	----
					Client sampling date / time: 17-Aug-2022 10:55	17-Aug-2022 09:55	----	----	----
					FJ2202203-001	FJ2202203-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	82.5	82.1	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	82.5	82.1	----	----	----
colour, true	----	E329	5.0	CU	6.9	6.6	----	----	----
conductivity	----	E100	2.0	µS/cm	177	177	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	93.7	90.2	----	----	----
pH	----	E108	0.10	pH units	8.10	8.10	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	117	127	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0146	0.0160	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.040	0.040	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.090	0.088	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0733	0.0697	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0030	0.0030	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.174	0.182	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0039	0.0035	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.51	4.51	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.1	13.1	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.58	2.90	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.72	3.01	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	1.93	1.92	----	----	----
cation sum	----	EC101	0.10	meq/L	1.93	1.86	----	----	----

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)					Client sample ID	**PR1**	**PC1**	**----**	**----**	**----**
					Client sampling date / time	17-Aug-2022 10:55	17-Aug-2022 09:55	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		**FJ2202203-001**	**FJ2202203-002**	--------	--------	--------
						Result	Result	----	----	----
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		<0.010	1.59	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		27.3	25.9	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.20	6.20	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202203**	Page	: 1 of 14
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 07:50
PO	: 1200-25.03.02	Issue Date	: 14-Sep-2022 16:39
C-O-C number	: 2022-Aug-MON8/9-Day 2		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PC1	E298	17-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR1	E298	17-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PC1	E235.Cl	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR1	E235.Cl	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1	E378-U	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1	E378-U	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1	E235.F	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1	E235.F	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1	E235.NO3-L	17-Aug-2022	22-Aug-2022	3 days	5 days	× EHT	22-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1	E235.NO3-L	17-Aug-2022	22-Aug-2022	3 days	5 days	× EHT	22-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1	E235.NO2-L	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1	E235.NO2-L	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PC1	E392	17-Aug-2022	----	----	----		23-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR1	E392	17-Aug-2022	----	----	----		23-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1	E235.SO4	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1	E235.SO4	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1	E375-T	17-Aug-2022	24-Aug-2022	----	----		26-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1	E375-T	17-Aug-2022	24-Aug-2022	----	----		26-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PC1	E318	17-Aug-2022	24-Aug-2022	----	----		27-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR1	E318	17-Aug-2022	24-Aug-2022	----	----		27-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PC1	E366	17-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR1	E366	17-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1	E372-U	17-Aug-2022	24-Aug-2022	----	----		26-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1	E372-U	17-Aug-2022	24-Aug-2022	----	----		26-Aug-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PC1	E421	17-Aug-2022	20-Aug-2022	----	----		21-Aug-2022	180 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PR1	E421	17-Aug-2022	20-Aug-2022	----	----		21-Aug-2022	180 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PC1	E358-L	17-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1	E358-L	17-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1	E355-L	17-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1	E355-L	17-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1	E290	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1	E290	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1	E329	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR1	E329	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	3 days	5 days	× EHT

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PC1	E100	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1	E100	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE PC1	E108	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1	E108	17-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	0.25 hrs	5.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PC1	E162	17-Aug-2022	----	----	----		22-Aug-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR1	E162	17-Aug-2022	----	----	----		22-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PC1	E160	17-Aug-2022	----	----	----		22-Aug-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1	E160	17-Aug-2022	----	----	----		22-Aug-2022	7 days	5 days	✓

Legend & Qualifier Definitions

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

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: **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	612898	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	616255	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	612907	1	14	7.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612914	1	7	14.2	5.0	✓
Conductivity in Water	E100	612900	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	611357	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	616094	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612902	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	612906	1	13	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612904	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612905	1	17	5.8	5.0	✓
pH by Meter	E108	612899	1	15	6.6	5.0	✓
Reactive Silica by Colourimetry	E392	615321	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612903	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	613629	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	616097	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	616091	1	18	5.5	5.0	✓
Total Nitrogen by Colourimetry	E366	616253	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	616095	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	616254	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	613630	1	9	11.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	612898	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	616255	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	612907	1	14	7.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612914	1	7	14.2	5.0	✓
Conductivity in Water	E100	612900	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	611357	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	616094	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612902	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	612906	1	13	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612904	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612905	1	17	5.8	5.0	✓
pH by Meter	E108	612899	1	15	6.6	5.0	✓
Reactive Silica by Colourimetry	E392	615321	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612903	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	613629	1	9	11.1	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	616097	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	616091	1	18	5.5	5.0	✓
Total Nitrogen by Colourimetry	E366	616253	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	616095	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	616254	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	613630	1	9	11.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	612898	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	616255	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	612907	1	14	7.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612914	1	7	14.2	5.0	✓
Conductivity in Water	E100	612900	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	611357	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	616094	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612902	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	612906	1	13	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612904	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612905	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	615321	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612903	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	613629	1	9	11.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	616097	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	616091	1	18	5.5	5.0	✓
Total Nitrogen by Colourimetry	E366	616253	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	616095	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	616254	1	6	16.6	5.0	✓
TSS by Gravimetry	E160	613630	1	9	11.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	616255	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	612907	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	611357	1	14	7.1	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	616094	1	4	25.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612902	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	612906	1	13	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612904	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612905	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	615321	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612903	1	13	7.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	616097	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	616091	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*
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	616253	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	616095	1	4	25.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	616254	1	6	16.6	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202203**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 07:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 20-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day 2	Issue Date	: 14-Sep-2022 16:39
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Courtney Cox	Analsyt	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	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: 612898)											
FJ2202203-001	PR1	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	82.5	81.8	0.852%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	82.5	81.8	0.852%	20%	----
Physical Tests (QC Lot: 612899)											
FJ2202203-001	PR1	pH	----	E108	0.10	pH units	8.10	8.04	0.743%	4%	----
Physical Tests (QC Lot: 612900)											
FJ2202203-001	PR1	conductivity	----	E100	2.0	µS/cm	177	178	0.788%	10%	----
Physical Tests (QC Lot: 612914)											
FJ2202188-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 613629)											
FJ2202203-001	PR1	solids, total dissolved [TDS]	----	E162	13	mg/L	117	120	2	Diff <2x LOR	----
Physical Tests (QC Lot: 613630)											
FJ2202203-001	PR1	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612902)											
FJ2202184-006	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612903)											
FJ2202184-006	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	82.6	82.7	0.0580%	20%	----
Anions and Nutrients (QC Lot: 612904)											
FJ2202184-006	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.144	0.144	0.290%	20%	----
Anions and Nutrients (QC Lot: 612905)											
FJ2202184-006	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612906)											
FJ2202184-006	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.084	0.082	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612907)											
FJ2202184-006	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	0.72	0.72	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 615321)											
FJ2202203-001	PR1	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.51	4.47	0.04	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 616091)											
FJ2202203-001	PR1	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.090	0.090	0.0006	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*
Anions and Nutrients (QC Lot: 616097)											
FJ2202203-001	PR1	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 616253)											
FJ2202203-001	PR1	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.174	0.183	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 616254)											
FJ2202203-001	PR1	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0039	0.0037	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 616255)											
FJ2202203-001	PR1	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0146	0.0126	0.0020	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 616094)											
FJ2202203-001	PR1	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.58	2.87	0.29	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 616095)											
FJ2202203-001	PR1	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.72	2.75	0.04	Diff <2x LOR	----
Dissolved Metals (QC Lot: 611357)											
VA22B9406-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.250	mg/L	99.7	100	0.670%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	40.8	40.2	1.35%	20%	----

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: 612898)						
alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	1.2	----
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	1.2	----
Physical Tests (QCLot: 612900)						
conductivity	----	E100	1	µS/cm	1.5	----
Physical Tests (QCLot: 612914)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 613629)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 613630)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 612902)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 612903)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 612904)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 612905)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 612906)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 612907)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 615321)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 616091)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 616097)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 616253)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 616254)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 616255)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 616094)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 616095)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 611357)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 612898)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	100	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 612899)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 612900)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.6	90.0	110	----
Physical Tests (QCLot: 612914)									
colour, true	----	E329	5	CU	100 CU	104	85.0	115	----
Physical Tests (QCLot: 613629)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	105	85.0	115	----
Physical Tests (QCLot: 613630)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.0	85.0	115	----
Anions and Nutrients (QCLot: 612902)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 612903)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.2	90.0	110	----
Anions and Nutrients (QCLot: 612904)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	96.6	90.0	110	----
Anions and Nutrients (QCLot: 612905)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	95.2	90.0	110	----
Anions and Nutrients (QCLot: 612906)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	95.9	90.0	110	----
Anions and Nutrients (QCLot: 612907)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	96.1	90.0	110	----
Anions and Nutrients (QCLot: 615321)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	99.0	85.0	115	----
Anions and Nutrients (QCLot: 616091)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	88.5	75.0	125	----
Anions and Nutrients (QCLot: 616097)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.7	80.0	120	----
Anions and Nutrients (QCLot: 616253)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	104	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 616254)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	87.1	80.0	120	----
Anions and Nutrients (QCLot: 616255)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Organic / Inorganic Carbon (QCLot: 616094)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 616095)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	105	80.0	120	----
Dissolved Metals (QCLot: 611357)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	100	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: 612902)										
FJ2202184-007	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0293 mg/L	0.03 mg/L	97.8	70.0	130	----
Anions and Nutrients (QCLot: 612903)										
FJ2202184-007	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	99.5 mg/L	100 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 612904)										
FJ2202184-007	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.42 mg/L	2.5 mg/L	96.7	75.0	125	----
Anions and Nutrients (QCLot: 612905)										
FJ2202184-007	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.460 mg/L	0.5 mg/L	92.0	75.0	125	----
Anions and Nutrients (QCLot: 612906)										
FJ2202184-007	Anonymous	fluoride	16984-48-8	E235.F	0.916 mg/L	1 mg/L	91.6	75.0	125	----
Anions and Nutrients (QCLot: 612907)										
FJ2202184-007	Anonymous	chloride	16887-00-6	E235.Cl	95.6 mg/L	100 mg/L	95.6	75.0	125	----
Anions and Nutrients (QCLot: 615321)										
FJ2202203-002	PC1	silicate (as SiO2)	7631-86-9	E392	9.98 mg/L	10 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 616091)										
FJ2202203-002	PC1	Kjeldahl nitrogen, total [TKN]	----	E318	2.31 mg/L	2.5 mg/L	92.3	70.0	130	----
Anions and Nutrients (QCLot: 616097)										
FJ2202203-002	PC1	phosphorus, total dissolved	7723-14-0	E375-T	0.0466 mg/L	0.05 mg/L	93.2	70.0	130	----
Anions and Nutrients (QCLot: 616253)										
FJ2202203-002	PC1	nitrogen, total	7727-37-9	E366	0.410 mg/L	0.4 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 616254)										
FJ2202203-002	PC1	phosphorus, total	7723-14-0	E372-U	0.0469 mg/L	0.05 mg/L	93.9	70.0	130	----
Anions and Nutrients (QCLot: 616255)										
FJ2202203-002	PC1	ammonia, total (as N)	7664-41-7	E298	0.112 mg/L	0.1 mg/L	112	75.0	125	----
Organic / Inorganic Carbon (QCLot: 616094)										
FJ2202203-002	PC1	carbon, dissolved organic [DOC]	----	E358-L	5.12 mg/L	5 mg/L	102	70.0	130	----
Organic / Inorganic Carbon (QCLot: 616095)										
FJ2202203-002	PC1	carbon, total organic [TOC]	----	E355-L	4.82 mg/L	5 mg/L	96.3	70.0	130	----
Dissolved Metals (QCLot: 611357)										

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: 611357) - continued										
FJ2202203-002	PC1	calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 1 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 2 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 3 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	Hardness (F)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PR1	17 AUG 22	10:55	Water	4	R	R	R	R	R		
	PC1	17 AUG 22	09:55	Water	4	R	R	R	R	R		
	~~PR2~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		
	~~PR3~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		
	~~PR4~~			Water	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		
	QA - 291			~~Water~~	4	R	R	R	R	R		

Environmental Division
Fort St. John
Work Order Reference
FJ2202203

Telephone : +1 250 261 5517

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

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
7.1							4.2

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: 18 AUG 2022	Time:	Received by:	Date: Aug 19/22	Time: 750	Received by:	Date: 8/18	Time: 4pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202201**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 18:38
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Aug-2022
C-O-C number	: 2022-Aug-MON8/9- Day 2	Issue Date	: 06-Jun-2023 14:37
Sampler	: Kevin Ganshorn, PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID: PR3	PR2-A	PR2-B	HD	----
						Client sampling date / time: 18-Aug-2022 10:20	18-Aug-2022 14:15	18-Aug-2022 14:15	18-Aug-2022 16:50	----
						FJ2202201-001	FJ2202201-002	FJ2202201-003	FJ2202201-004	--------
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L	82.4	78.2	79.0	171	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L	<1.0	<1.0	<1.0	10.2	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	A	1.0	mg/L	<1.0	<1.0	<1.0	5.1	----
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L	82.4	78.2	79.0	182	----
Colour, true	----	E329/VA	A	5.0	CU	6.0	5.9	5.5	5.5	----
Conductivity	----	E100/VA	A	2.0	µS/cm	187	185	184	421	----
Hardness (as CaCO3), dissolved	----	EC100/VA		0.60	mg/L	97.7	95.6	97.6	225	----
pH	----	E108/VA	A	0.10	pH units	8.07	8.07	8.09	8.43	----
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L	131	125	130	300	----
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L	12.4	12.0	<3.0	<3.0	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L	0.0102	<0.0050	0.0055	<0.0050	----
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	----
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L	0.041	0.040	0.041	0.107	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	A	0.050	mg/L	0.074	0.074	0.083	0.106	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L	0.0648	0.0647	0.0640	<0.0050	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L	0.0019	0.0023	0.0023	<0.0010	----
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L	0.141	0.141	0.140	0.081	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L	<0.0010	<0.0010	<0.0010	0.0013	----
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L	0.0095	0.0108	0.0116	0.0320	----
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L	4.38	4.38	4.38	3.86	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L	13.8	13.2	13.2	50.0	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L	2.43	2.55	2.48	2.80	----
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L	2.84	2.69	2.97	2.71	----

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	PR3	PR2-A	PR2-B	HD	----
Client sample ID						**PR3**	**PR2-A**	**PR2-B**	**HD**	**----**
Client sampling date / time						18-Aug-2022 10:20	18-Aug-2022 14:15	18-Aug-2022 14:15	18-Aug-2022 16:50	----
						FJ2202201-001	**FJ2202201-002**	**FJ2202201-003**	**FJ2202201-004**	**--------**
						Result	Result	Result	Result	----
Ion Balance										
Anion sum	----	EC101/VA		0.10	meq/L	1.94	1.84	1.86	4.68	----
Cation sum	----	EC101/VA		0.10	meq/L	2.01	1.97	2.01	4.64	----
Ion balance (APHA)	----	EC101/VA		0.010	%	1.77	3.41	3.88	0.429	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L	28.0	27.8	28.2	61.7	----
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L	6.74	6.36	6.60	17.3	----
Dissolved metals filtration location	----	EP421/VA		-	-	Laboratory	Laboratory	Laboratory	Laboratory	----

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	: **FJ2202201**	Page	: 1 of 19
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 18:38
PO	: 1200-25.03.02	Issue Date	: 06-Jun-2023 14:37
C-O-C number	: 2022-Aug-MON8/9- Day 2		
Sampler	: Kevin Ganshorn, PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD	E298	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2-A	E298	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2-B	E298	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR3	E298	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD	E235.Cl	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2-A	E235.Cl	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2-B	E235.Cl	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PR3	E235.Cl	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD	E378-U	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2-A	E378-U	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2-B	E378-U	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3	E378-U	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD	E235.F	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2-A	E235.F	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2-B	E235.F	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3	E235.F	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD	E235.NO3-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2-A	E235.NO3-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2-B	E235.NO3-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR3	E235.NO3-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD	E235.NO2-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2-A	E235.NO2-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2-B	E235.NO2-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3	E235.NO2-L	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE HD	E392	18-Aug-2022	----	----	----		23-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR2-A	E392	18-Aug-2022	----	----	----		23-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR2-B	E392	18-Aug-2022	----	----	----		23-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR3	E392	18-Aug-2022	----	----	----		23-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD	E235.SO4	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2-A	E235.SO4	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2-B	E235.SO4	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3	E235.SO4	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD	E375-T	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2-A	E375-T	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2-B	E375-T	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3	E375-T	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD	E318	18-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR2-A	E318	18-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR2-B	E318	18-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR3	E318	18-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	11 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) HD	E366	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR2-A	E366	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR2-B	E366	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR3	E366	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD	E372-U	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2-A	E372-U	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2-B	E372-U	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3	E372-U	18-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) HD	E421	18-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PR2-A	E421	18-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PR2-B	E421	18-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PR3	E421	18-Aug-2022	22-Aug-2022	----	----		22-Aug-2022	180 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD	E358-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2-A	E358-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2-B	E358-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3	E358-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD	E355-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2-A	E355-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2-B	E355-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3	E355-L	18-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE HD	E290	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2-A	E290	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2-B	E290	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3	E290	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD	E329	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR2-A	E329	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR2-B	E329	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR3	E329	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	3 days	4 days	× EHT
Physical Tests : Conductivity in Water										
HDPE HD	E100	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PR2-A	E100	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PR2-B	E100	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3	E100	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE HD	E108	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	0.25 hrs	18.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2-A	E108	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	0.25 hrs	18.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2-B	E108	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	0.25 hrs	18.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3	E108	18-Aug-2022	21-Aug-2022	----	----		22-Aug-2022	0.25 hrs	18.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD	E162	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR2-A	E162	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 PR2-B	E162	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR3	E162	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD	E160	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2-A	E160	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2-B	E160	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3	E160	18-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓

Legend & Qualifier Definitions

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

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: **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	612174	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	618206	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	612177	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612183	1	5	20.0	5.0	✓
Conductivity in Water	E100	612175	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613090	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618202	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612184	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	612176	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612178	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612179	1	19	5.2	5.0	✓
pH by Meter	E108	612173	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	615320	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612180	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618207	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618201	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618204	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618203	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618205	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	612174	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	618206	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	612177	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612183	1	5	20.0	5.0	✓
Conductivity in Water	E100	612175	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613090	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618202	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612184	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	612176	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612178	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612179	1	19	5.2	5.0	✓
pH by Meter	E108	612173	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	615320	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612180	1	14	7.1	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							
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618207	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618201	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618204	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618203	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618205	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	612174	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	618206	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	612177	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	612183	1	5	20.0	5.0	✓
Conductivity in Water	E100	612175	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613090	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618202	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612184	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	612176	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612178	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612179	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	615320	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612180	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618207	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618201	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618204	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618203	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618205	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	618206	1	15	6.6	5.0	✓
Chloride in Water by IC	E235.Cl	612177	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	613090	1	8	12.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618202	1	15	6.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	612184	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	612176	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	612178	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	612179	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	615320	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	612180	1	14	7.1	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618207	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618201	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618204	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618203	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618205	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202201**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 18-Aug-2022 18:38
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Aug-2022
C-O-C number	: 2022-Aug-MON8/9- Day 2	Issue Date	: 06-Jun-2023 14:37
Sampler	: Kevin Ganshorn, BD 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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: 612173)											
FJ2202201-001	PR3	pH	----	E108	0.10	pH units	8.07	8.05	0.248%	4%	----
Physical Tests (QC Lot: 612174)											
FJ2202201-001	PR3	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	82.4	81.6	0.976%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	82.4	81.6	0.976%	20%	----
Physical Tests (QC Lot: 612175)											
FJ2202201-001	PR3	Conductivity	----	E100	2.0	µS/cm	187	188	0.427%	10%	----
Physical Tests (QC Lot: 612183)											
FJ2202201-001	PR3	Colour, true	----	E329	5.0	CU	6.0	5.6	0.3	Diff <2x LOR	----
Physical Tests (QC Lot: 619261)											
FJ2202201-001	PR3	Solids, total suspended [TSS]	----	E160	3.0	mg/L	12.4	12.8	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 619264)											
FJ2202201-001	PR3	Solids, total dissolved [TDS]	----	E162	13	mg/L	131	124	6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612176)											
VA22B9308-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612177)											
VA22B9308-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	42.9	42.8	0.326%	20%	----
Anions and Nutrients (QC Lot: 612178)											
VA22B9308-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	0.0257	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612179)											
VA22B9308-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0284	0.0290	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 612180)											
VA22B9308-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	18.6	18.8	0.647%	20%	----
Anions and Nutrients (QC Lot: 612184)											
FJ2202201-001	PR3	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 615320)											
CG2211043-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	5.00	mg/L	37.4	36.9	0.54	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*
Anions and Nutrients (QC Lot: 618201)											
FJ2202201-001	PR3	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.074	0.080	0.006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618204)											
FJ2202201-001	PR3	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.141	0.144	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618205)											
FJ2202201-001	PR3	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0095	0.0095	0.00006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618206)											
FJ2202201-001	PR3	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0102	0.0103	0.00005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618207)											
FJ2202201-001	PR3	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 618202)											
FJ2202201-001	PR3	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.43	2.56	0.13	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 618203)											
FJ2202201-001	PR3	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.84	2.71	0.13	Diff <2x LOR	----
Dissolved Metals (QC Lot: 613090)											
CG2210819-009	Anonymous	Calcium, dissolved	7440-70-2	E421	0.100	mg/L	488	498	2.20%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	248	253	2.14%	20%	----

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: 612174)						
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: 612175)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 612183)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 619261)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 619264)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 612176)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 612177)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 612178)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 612179)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 612180)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 612184)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 615320)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 618201)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 618204)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 618205)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 618205) - continued						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 618206)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 618207)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 618202)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 618203)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 613090)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 612173)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 612174)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	106	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	102	85.0	115	----
Physical Tests (QCLot: 612175)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.6	90.0	110	----
Physical Tests (QCLot: 612183)									
Colour, true	----	E329	5	CU	100 CU	104	85.0	115	----
Physical Tests (QCLot: 619261)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.0	85.0	115	----
Physical Tests (QCLot: 619264)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	113	85.0	115	----
Anions and Nutrients (QCLot: 612176)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	95.4	90.0	110	----
Anions and Nutrients (QCLot: 612177)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	96.1	90.0	110	----
Anions and Nutrients (QCLot: 612178)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	96.5	90.0	110	----
Anions and Nutrients (QCLot: 612179)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	94.9	90.0	110	----
Anions and Nutrients (QCLot: 612180)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.2	90.0	110	----
Anions and Nutrients (QCLot: 612184)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 615320)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	98.5	85.0	115	----
Anions and Nutrients (QCLot: 618201)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.2	75.0	125	----
Anions and Nutrients (QCLot: 618204)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 618205)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 618205) - continued									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.2	80.0	120	----
Anions and Nutrients (QCLot: 618206)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.4	85.0	115	----
Anions and Nutrients (QCLot: 618207)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 618202)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.8	80.0	120	----
Organic / Inorganic Carbon (QCLot: 618203)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.2	80.0	120	----
Dissolved Metals (QCLot: 613090)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.0	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 612176)										
FJ2202200-003	Anonymous	Fluoride	16984-48-8	E235.F	0.996 mg/L	1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 612177)										
FJ2202200-003	Anonymous	Chloride	16887-00-6	E235.Cl	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 612178)										
FJ2202200-003	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.52 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 612179)										
FJ2202200-003	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.489 mg/L	0.5 mg/L	97.9	75.0	125	----
Anions and Nutrients (QCLot: 612180)										
FJ2202200-003	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 612184)										
FJ2202201-002	PR2-A	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0300 mg/L	0.03 mg/L	99.9	70.0	130	----
Anions and Nutrients (QCLot: 615320)										
CG2211043-002	Anonymous	Silicate (as SiO2)	7631-86-9	E392	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 618201)										
FJ2202201-002	PR2-A	Kjeldahl nitrogen, total [TKN]	----	E318	2.56 mg/L	2.5 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 618204)										
FJ2202201-002	PR2-A	Nitrogen, total	7727-37-9	E366	0.394 mg/L	0.4 mg/L	98.6	70.0	130	----
Anions and Nutrients (QCLot: 618205)										
FJ2202201-002	PR2-A	Phosphorus, total	7723-14-0	E372-U	0.0457 mg/L	0.05 mg/L	91.4	70.0	130	----
Anions and Nutrients (QCLot: 618206)										
FJ2202201-002	PR2-A	Ammonia, total (as N)	7664-41-7	E298	0.0937 mg/L	0.1 mg/L	93.7	75.0	125	----
Anions and Nutrients (QCLot: 618207)										
FJ2202201-002	PR2-A	Phosphorus, total dissolved	7723-14-0	E375-T	0.0456 mg/L	0.05 mg/L	91.3	70.0	130	----
Organic / Inorganic Carbon (QCLot: 618202)										
FJ2202201-002	PR2-A	Carbon, dissolved organic [DOC]	----	E358-L	5.26 mg/L	5 mg/L	105	70.0	130	----
Organic / Inorganic Carbon (QCLot: 618203)										
FJ2202201-002	PR2-A	Carbon, total organic [TOC]	----	E355-L	5.05 mg/L	5 mg/L	101	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 613090)										
FJ2202200-001	Anonymous	Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

Analysis Request

ALS Lab Work Order # (ALS use only):

Contact: Sneha Sansare Sampler: Pat Beaupre

ALS Sample # (ALS use only)	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Si diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (F)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL (F)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PR2~~			~~Water~~	~~4~~	R	R	R	R	R			
	~~PR3~~ 2-81	18 AUG 22	10:20	Water	4	R	R	R	R	R			
	PR2-A	18 AUG 22	14:15	Water	4	R	R	R	R	R			
	PR2-B	18 AUG 22	14:15	Water	4	R	R	R	R	R			
	HD	18 AUG 22	16:50	Water	4	R	R	R	R	R			

For St. John
Work Order Reference
FJ2202201

Telephone : +1 250 261 5517

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

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
9.2	1.7

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Aug 18, 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Aug 18/22	18:15

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Aug 19 2022	6:46

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202227**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Aug-2022 15:54
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day3	Issue Date	: 14-Sep-2022 16:42
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA	PD2	PINE	PD1-A	PD1-B
					Client sampling date / time	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]
						FJ2202227-001	FJ2202227-002	FJ2202227-003	FJ2202227-004	FJ2202227-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		62.0	85.3	123	83.4	83.9
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	6.8	<1.0	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	3.4	<1.0	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		62.0	85.3	130	83.4	83.9
colour, true	----	E329	5.0	CU		226	5.8	<5.0	5.3	5.5
conductivity	----	E100	2.0	µS/cm		192	194	270	190	189
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		83.8	95.1	143	93.8	93.3
pH	----	E108	0.10	pH units		7.90	8.15	8.40	8.14	8.12
solids, total dissolved [TDS]	----	E162	10	mg/L		233	128	173	134	129
solids, total suspended [TSS]	----	E160	3.0	mg/L		18.6	33.0	<3.0	31.2	31.6
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0110	<0.0050	<0.0050	0.0112	0.0064
chloride	16887-00-6	E235.Cl	0.50	mg/L		0.56	<0.50	0.85	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.088	0.036	0.055	0.034	0.034
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		1.05	0.124	0.057	0.134	0.113
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		<0.0050	0.0640	<0.0050	0.0674	0.0683
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	0.0026	<0.0010	0.0029	0.0024
nitrogen, total	7727-37-9	E366	0.030	mg/L		0.815	0.156	0.063	0.163	0.158
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0120	<0.0010	<0.0010	<0.0010	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0735	0.0335	0.0079	0.0412	0.0401
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0230	0.0023	<0.0020	0.0021	<0.0020
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		6.39	4.26	1.97	4.37	4.36
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		30.8	15.0	18.0	14.8	14.9
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		37.6	2.89	1.41	2.53	2.74
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		37.3	2.86	1.31	2.48	2.66
Ion Balance										
anion sum	----	EC101	0.10	meq/L		1.90	2.02	3.00	1.98	1.99
cation sum	----	EC101	0.10	meq/L		2.21	1.97	2.99	1.94	1.93
ion balance (APHA)	----	EC101	0.010	%		7.54	1.25	0.167	1.02	1.53

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA	PD2	PINE	PD1-A	PD1-B
					Client sampling date / time	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]	[19-Aug-2022]
						FJ2202227-001	FJ2202227-002	FJ2202227-003	FJ2202227-004	FJ2202227-005
						Result	Result	Result	Result	Result
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		23.0	27.5	40.5	27.1	27.0
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.40	6.43	10.1	6.35	6.28
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202227**	Page	: 1 of 22
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Aug-2022 15:54
PO	: 1200-25.03.02	Issue Date	: 14-Sep-2022 16:42
C-O-C number	: 2022-Aug-MON8/9-Day3		
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEA	E298	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD1-A	E298	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD1-B	E298	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2	E298	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PINE	E298	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
BEA	E235.Cl	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
PD1-A	E235.Cl	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PD1-B	E235.Cl	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2	E235.Cl	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE	E235.Cl	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA	E378-U	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1-A	E378-U	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1-B	E378-U	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2	E378-U	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE	E378-U	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA	E235.F	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1-A	E235.F	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1-B	E235.F	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2	E235.F	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE	E235.F	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA	E235.NO3-L	19-Aug-2022	25-Aug-2022	3 days	6 days	× EHT	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1-A	E235.NO3-L	19-Aug-2022	25-Aug-2022	3 days	6 days	× EHT	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1-B	E235.NO3-L	19-Aug-2022	25-Aug-2022	3 days	6 days	× EHT	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2	E235.NO3-L	19-Aug-2022	25-Aug-2022	3 days	6 days	× EHT	25-Aug-2022	3 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PINE	E235.NO3-L	19-Aug-2022	25-Aug-2022	3 days	6 days	× EHT	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE BEA	E235.NO2-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1-A	E235.NO2-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1-B	E235.NO2-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2	E235.NO2-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE	E235.NO2-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE BEA	E392	19-Aug-2022	----	----	----		25-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1-A	E392	19-Aug-2022	----	----	----		25-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1-B	E392	19-Aug-2022	----	----	----		25-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PD2	E392	19-Aug-2022	----	----	----		25-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PINE	E392	19-Aug-2022	----	----	----		25-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA	E235.SO4	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1-A	E235.SO4	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1-B	E235.SO4	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2	E235.SO4	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE	E235.SO4	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA	E375-T	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1-A	E375-T	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PD1-B	E375-T	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PD2	E375-T	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PINE	E375-T	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
BEA	E318	19-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD1-A	E318	19-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD1-B	E318	19-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD2	E318	19-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PINE	E318	19-Aug-2022	25-Aug-2022	----	----		29-Aug-2022	28 days	10 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
BEA	E366	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD1-A	E366	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD1-B	E366	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2	E366	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PINE	E366	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA	E372-U	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD1-A	E372-U	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD1-B	E372-U	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2	E372-U	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PINE	E372-U	19-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
BEA	E421	19-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD1-A	E421	19-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD1-B	E421	19-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD2	E421	19-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PINE	E421	19-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
BEA	E358-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD1-A	E358-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD1-B	E358-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD2	E358-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE	E358-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA	E355-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1-A	E355-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1-B	E355-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2	E355-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PINE	E355-L	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA	E290	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1-A	E290	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1-B	E290	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD2	E290	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	6 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PINE	E290	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	6 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE BEA	E329	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1-A	E329	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1-B	E329	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2	E329	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PINE	E329	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	6 days	× EHT
Physical Tests : Conductivity in Water										
HDPE BEA	E100	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PD1-A	E100	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PD1-B	E100	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2	E100	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE	E100	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	6 days	✓
Physical Tests : pH by Meter										
HDPE BEA	E108	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD1-A	E108	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD1-B	E108	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD2	E108	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.58 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE	E108	19-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	0.58 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA	E162	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓

Matrix: **Water**

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

Analyte Group / 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 PD1-A	E162	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD1-B	E162	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2	E162	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PINE	E162	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA	E160	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1-A	E160	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1-B	E160	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2	E160	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE	E160	19-Aug-2022	----	----	----		25-Aug-2022	7 days	7 days	✓

Legend & Qualifier Definitions

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

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: **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	618211	1	6	16.6	5.0	✓
Ammonia by Fluorescence	E298	618244	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	618216	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	618213	1	11	9.0	5.0	✓
Conductivity in Water	E100	618212	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	616443	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618245	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618214	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	618215	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	618217	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	618218	1	8	12.5	5.0	✓
pH by Meter	E108	618210	1	13	7.6	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	618219	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618243	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618239	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618241	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618240	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618242	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	618211	1	6	16.6	5.0	✓
Ammonia by Fluorescence	E298	618244	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	618216	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	618213	1	11	9.0	5.0	✓
Conductivity in Water	E100	618212	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	616443	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618245	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618214	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	618215	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	618217	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	618218	1	8	12.5	5.0	✓
pH by Meter	E108	618210	1	13	7.6	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	618219	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618243	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618239	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618241	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618240	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618242	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	618211	1	6	16.6	5.0	✓
Ammonia by Fluorescence	E298	618244	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	618216	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	618213	1	11	9.0	5.0	✓
Conductivity in Water	E100	618212	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	616443	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618245	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618214	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	618215	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	618217	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	618218	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	618219	1	8	12.5	5.0	✓
TDS by Gravimetry	E162	619264	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618243	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618239	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	618241	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618240	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618242	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	619261	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	618244	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	618216	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	616443	1	7	14.2	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	618245	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	618214	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	618215	1	8	12.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	618217	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	618218	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	618219	1	8	12.5	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	618243	1	9	11.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	618239	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	618241	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	618240	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	618242	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202227**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Aug-2022 15:54
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Aug-2022
C-O-C number	: 2022-Aug-MON8/9-Day3	Issue Date	: 14-Sep-2022 16:42
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	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: 618210)											
FJ2202227-001	BEA	pH	----	E108	0.10	pH units	7.90	7.88	0.253%	4%	----
Physical Tests (QC Lot: 618211)											
FJ2202227-001	BEA	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	62.0	61.6	0.647%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	62.0	61.6	0.647%	20%	----
Physical Tests (QC Lot: 618212)											
FJ2202227-001	BEA	conductivity	----	E100	2.0	µS/cm	192	191	0.887%	10%	----
Physical Tests (QC Lot: 618213)											
FJ2202227-001	BEA	colour, true	----	E329	50.0	CU	226	236	9.8	Diff <2x LOR	----
Physical Tests (QC Lot: 619261)											
FJ2202201-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	12.4	12.8	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 619264)											
FJ2202201-001	Anonymous	solids, total dissolved [TDS]	----	E162	13	mg/L	131	124	6	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618214)											
FJ2202227-001	BEA	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0120	0.0128	6.57%	20%	----
Anions and Nutrients (QC Lot: 618215)											
FJ2202226-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.065	0.068	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618216)											
FJ2202226-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618217)											
FJ2202226-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0196	0.0184	0.0011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618218)											
FJ2202226-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 618219)											
FJ2202226-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	51.4	51.4	0.0366%	20%	----
Anions and Nutrients (QC Lot: 618239)											
FJ2202227-001	BEA	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.05	0.952	9.95%	20%	----
Anions and Nutrients (QC Lot: 618241)											
FJ2202227-001	BEA	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.815	0.826	1.38%	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*
Anions and Nutrients (QC Lot: 618242)											
FJ2202227-001	BEA	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0735	0.0797	8.12%	20%	----
Anions and Nutrients (QC Lot: 618243)											
FJ2202227-001	BEA	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0230	0.0224	2.64%	20%	----
Anions and Nutrients (QC Lot: 618244)											
FJ2202227-001	BEA	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0110	0.0100	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 619371)											
FJ2202227-001	BEA	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.39	6.38	0.142%	20%	----
Organic / Inorganic Carbon (QC Lot: 618240)											
FJ2202227-001	BEA	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	37.3	40.4	7.98%	20%	----
Organic / Inorganic Carbon (QC Lot: 618245)											
FJ2202227-001	BEA	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	37.6	39.7	5.31%	20%	----
Dissolved Metals (QC Lot: 616443)											
FJ2202227-002	PD2	calcium, dissolved	7440-70-2	E421	0.050	mg/L	27.5	29.1	5.69%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.43	6.68	3.84%	20%	----

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: 618211)						
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: 618212)						
conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 618213)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 619261)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 619264)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 618214)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 618215)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 618216)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 618217)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 618218)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 618219)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 618239)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 618241)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 618242)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 618243)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 618244)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 619371)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 618240)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 618245)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 616443)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 618210)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 618211)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	109	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 618212)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.8	90.0	110	----
Physical Tests (QCLot: 618213)									
colour, true	----	E329	5	CU	100 CU	104	85.0	115	----
Physical Tests (QCLot: 619261)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.0	85.0	115	----
Physical Tests (QCLot: 619264)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	113	85.0	115	----
Anions and Nutrients (QCLot: 618214)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 618215)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 618216)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 618217)									
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: 618218)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 618219)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 618239)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 618241)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 618242)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.6	80.0	120	----
Anions and Nutrients (QCLot: 618243)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	87.3	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 618244)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.4	85.0	115	----
Anions and Nutrients (QCLot: 619371)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Organic / Inorganic Carbon (QCLot: 618240)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	105	80.0	120	----
Organic / Inorganic Carbon (QCLot: 618245)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 616443)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.2	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	95.9	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: 618214)										
FJ2202227-002	PD2	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0277 mg/L	0.03 mg/L	92.5	70.0	130	----
Anions and Nutrients (QCLot: 618215)										
VA22B9818-001	Anonymous	fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 618216)										
VA22B9818-001	Anonymous	chloride	16887-00-6	E235.Cl	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 618217)										
VA22B9818-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.62 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 618218)										
VA22B9818-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.512 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 618219)										
VA22B9818-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 618239)										
FJ2202227-002	PD2	Kjeldahl nitrogen, total [TKN]	----	E318	2.65 mg/L	2.5 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 618241)										
FJ2202227-002	PD2	nitrogen, total	7727-37-9	E366	0.404 mg/L	0.4 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 618242)										
FJ2202227-002	PD2	phosphorus, total	7723-14-0	E372-U	0.0465 mg/L	0.05 mg/L	93.0	70.0	130	----
Anions and Nutrients (QCLot: 618243)										
FJ2202227-002	PD2	phosphorus, total dissolved	7723-14-0	E375-T	0.0456 mg/L	0.05 mg/L	91.3	70.0	130	----
Anions and Nutrients (QCLot: 618244)										
FJ2202227-002	PD2	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 619371)										
FJ2202227-002	PD2	silicate (as SiO2)	7631-86-9	E392	9.46 mg/L	10 mg/L	94.6	75.0	125	----
Organic / Inorganic Carbon (QCLot: 618240)										
FJ2202227-002	PD2	carbon, total organic [TOC]	----	E355-L	4.91 mg/L	5 mg/L	98.3	70.0	130	----
Organic / Inorganic Carbon (QCLot: 618245)										
FJ2202227-002	PD2	carbon, dissolved organic [DOC]	----	E358-L	5.41 mg/L	5 mg/L	108	70.0	130	----
Dissolved Metals (QCLot: 616443)										

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: 616443) - continued										
FJ2202227-003	PINE	calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests
Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm
For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH	DOC, Total dissolved P	Hardness	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
						F/P	F	F	P				
	BEA			Water	4	R	R	R	R	R			
	PD2			Water	4	R	R	R	R	R			
	PINE			Water	4	R	R	R	R	R			
	PD1-A			Water	4	R	R	R	R	R			
	PD1-B			Water	4	R	R	R	R	R			
	~~PR-2.01~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~MB~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~MB-FD~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			

Telephone : +1 250 261 5517

Fort St. John
Work Order Reference
FJ2202227

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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
	Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
12.3							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Kevin Ganshorn	Date: Aug 19 2022	Time: 15:45	Received by:	Date: Aug 19, 22	Time: 3:45	Received by:	Date:	Time:

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202273**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Aug-2022 16:49
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Aug-2022
C-O-C number	: ----	Issue Date	: 09-Sep-2022 17:45
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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*
Erin Sanchez		Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	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 Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: MD	----	----	----	----
					Client sampling date / time: 22-Aug-2022 16:00	----	----	----	----
					FJ2202273-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	128	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	5.4	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	2.7	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	134	----	----	----	----
colour, true	----	E329	5.0	CU	13.5	----	----	----	----
conductivity	----	E100	2.0	µS/cm	260	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	143	----	----	----	----
pH	----	E108	0.10	pH units	8.34	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	174	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	----	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0050	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.085	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.157	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.158	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0150	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0023	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.08	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	12.2	----	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	5.40	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	5.51	----	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.94	----	----	----	----
cation sum	----	EC101	0.10	meq/L	3.03	----	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: **MD**	----	----	----	----
					Client sampling date / time: 22-Aug-2022 16:00	----	----	----	----
					FJ2202273-001	--------	--------	--------	--------
					Result	----	----	----	----
Ion Balance									
ion balance (APHA)	----	EC101	0.010	%	1.51	----	----	----	----
Dissolved Metals									
calcium, dissolved	7440-70-2	E421	0.050	mg/L	40.2	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	10.4	----	----	----	----
dissolved metals filtration location	----	EP421	-	-	Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202273**	Page	: 1 of 12
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Aug-2022 16:49
PO	: 1200-25.03.02	Issue Date	: 09-Sep-2022 17:45
C-O-C number	: ----		
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MD	E298	22-Aug-2022	26-Aug-2022	----	----		26-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MD	E235.Cl	22-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD	E378-U	22-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD	E235.F	22-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD	E235.NO3-L	22-Aug-2022	24-Aug-2022	3 days	2 days	✓	24-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD	E235.NO2-L	22-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MD	E392	22-Aug-2022	----	----	----		25-Aug-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
MD	E235.SO4	22-Aug-2022	24-Aug-2022	----	----		24-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
MD	E375-T	22-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MD	E318	22-Aug-2022	26-Aug-2022	----	----		29-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
MD	E366	22-Aug-2022	26-Aug-2022	----	----		29-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
MD	E372-U	22-Aug-2022	26-Aug-2022	----	----		27-Aug-2022	28 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
MD	E421	22-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	180 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MD	E358-L	22-Aug-2022	26-Aug-2022	----	----		26-Aug-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MD	E355-L	22-Aug-2022	26-Aug-2022	----	----		26-Aug-2022	28 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MD	E290	22-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	14 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE MD	E329	22-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE MD	E100	22-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE MD	E108	22-Aug-2022	24-Aug-2022	----	----		25-Aug-2022	0.25 hrs	8.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE MD	E162	22-Aug-2022	----	----	----		26-Aug-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD	E160	22-Aug-2022	----	----	----		26-Aug-2022	7 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	617303	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	620019	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	617306	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617312	1	1	100.0	5.0	✓
Conductivity in Water	E100	617304	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618257	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	620015	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617311	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	617305	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617308	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617309	1	16	6.2	5.0	✓
pH by Meter	E108	617302	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617310	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	620318	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	620018	1	7	14.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	620013	1	6	16.6	5.0	✓
Total Nitrogen by Colourimetry	E366	620017	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	620016	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	620014	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	620308	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	617303	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	620019	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	617306	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617312	1	1	100.0	5.0	✓
Conductivity in Water	E100	617304	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618257	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	620015	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617311	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	617305	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617308	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617309	1	16	6.2	5.0	✓
pH by Meter	E108	617302	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617310	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	620318	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	620018	1	7	14.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	620013	1	6	16.6	5.0	✓
Total Nitrogen by Colourimetry	E366	620017	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	620016	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	620014	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	620308	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	617303	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	620019	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	617306	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617312	1	1	100.0	5.0	✓
Conductivity in Water	E100	617304	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618257	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	620015	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617311	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	617305	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617308	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617309	1	16	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617310	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	620318	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	620018	1	7	14.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	620013	1	6	16.6	5.0	✓
Total Nitrogen by Colourimetry	E366	620017	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	620016	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	620014	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	620308	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	620019	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	617306	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618257	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	620015	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617311	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	617305	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617308	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617309	1	16	6.2	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617310	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	620018	1	7	14.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	620013	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*
Matrix Spikes (MS) - Continued							
Total Nitrogen by Colourimetry	E366	620017	1	7	14.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	620016	1	19	5.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	620014	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202273**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Aug-2022 16:49
PO	: 1200-25.03.02	Date Analysis Commenced	: 24-Aug-2022
C-O-C number	: ----	Issue Date	: 09-Sep-2022 17:45
Sampler	: ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
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*
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	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: 617302)											
FJ2202261-019	Anonymous	pH	----	E108	0.10	pH units	8.30	8.31	0.120%	4%	----
Physical Tests (QC Lot: 617303)											
FJ2202261-019	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	171	171	0.409%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	5.0	5.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	2.5	2.5	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	176	176	0.398%	20%	----
Physical Tests (QC Lot: 617304)											
FJ2202261-019	Anonymous	conductivity	----	E100	2.0	µS/cm	1010	1010	0.297%	10%	----
Physical Tests (QC Lot: 617312)											
FJ2202273-001	MD	colour, true	----	E329	5.0	CU	13.5	14.0	0.5	Diff <2x LOR	----
Physical Tests (QC Lot: 620308)											
FJ2202240-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 620318)											
FJ2202240-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	222	217	2.50%	20%	----
Anions and Nutrients (QC Lot: 617305)											
FJ2202261-017	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.133	0.129	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 617306)											
FJ2202261-017	Anonymous	chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 617308)											
FJ2202261-017	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	1.85	1.83	1.03%	20%	----
Anions and Nutrients (QC Lot: 617309)											
FJ2202261-017	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0078	0.0066	0.0013	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 617310)											
FJ2202261-017	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	218	215	1.09%	20%	----
Anions and Nutrients (QC Lot: 617311)											
FJ2202261-017	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 619371)											
FJ2202227-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.39	6.38	0.142%	20%	----
Anions and Nutrients (QC Lot: 620013)											
VA22B9516-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.159	0.158	0.002	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*
Anions and Nutrients (QC Lot: 620014)											
FJ2202261-017	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0233	0.0228	2.30%	20%	----
Anions and Nutrients (QC Lot: 620017)											
FJ2202259-004	Anonymous	nitrogen, total	7727-37-9	E366	0.030	mg/L	1.47	1.45	1.59%	20%	----
Anions and Nutrients (QC Lot: 620018)											
FJ2202259-004	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0340	0.0335	1.42%	20%	----
Anions and Nutrients (QC Lot: 620019)											
FJ2202259-004	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.165	0.164	0.621%	20%	----
Organic / Inorganic Carbon (QC Lot: 620015)											
FJ2202259-004	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.31	2.29	0.02	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 620016)											
FJ2202259-004	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.84	2.00	0.16	Diff <2x LOR	----
Dissolved Metals (QC Lot: 618257)											
VA22B9691-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.250	mg/L	277	276	0.627%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	46.0	46.5	1.12%	20%	----

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: 617303)						
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: 617304)						
conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 617312)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 620308)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 620318)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 617305)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 617306)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 617308)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 617309)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 617310)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 617311)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 619371)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 620013)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 620014)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 620017)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 620018)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 620019)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 620015)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 620016)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 618257)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 617302)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 617303)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	113	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 617304)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.4	90.0	110	----
Physical Tests (QCLot: 617312)									
colour, true	----	E329	5	CU	100 CU	103	85.0	115	----
Physical Tests (QCLot: 620308)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.0	85.0	115	----
Physical Tests (QCLot: 620318)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 617305)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	94.6	90.0	110	----
Anions and Nutrients (QCLot: 617306)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.4	90.0	110	----
Anions and Nutrients (QCLot: 617308)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 617309)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	95.0	90.0	110	----
Anions and Nutrients (QCLot: 617310)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 617311)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	92.3	80.0	120	----
Anions and Nutrients (QCLot: 619371)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 620013)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	93.4	75.0	125	----
Anions and Nutrients (QCLot: 620014)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.5	80.0	120	----
Anions and Nutrients (QCLot: 620017)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	104	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 620018)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	93.0	80.0	120	----
Anions and Nutrients (QCLot: 620019)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 620015)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Organic / Inorganic Carbon (QCLot: 620016)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	106	80.0	120	----
Dissolved Metals (QCLot: 618257)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	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: 617305)										
FJ2202261-018	Anonymous	fluoride	16984-48-8	E235.F	0.987 mg/L	1 mg/L	98.7	75.0	125	----
Anions and Nutrients (QCLot: 617306)										
FJ2202261-018	Anonymous	chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 617308)										
FJ2202261-018	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.54 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 617309)										
FJ2202261-018	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.500 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 617310)										
FJ2202261-018	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 617311)										
FJ2202261-018	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0336 mg/L	0.03 mg/L	112	70.0	130	----
Anions and Nutrients (QCLot: 619371)										
FJ2202227-002	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.46 mg/L	10 mg/L	94.6	75.0	125	----
Anions and Nutrients (QCLot: 620013)										
FJ2202273-001	MD	Kjeldahl nitrogen, total [TKN]	----	E318	2.46 mg/L	2.5 mg/L	98.6	70.0	130	----
Anions and Nutrients (QCLot: 620014)										
FJ2202259-004	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0482 mg/L	0.05 mg/L	96.4	70.0	130	----
Anions and Nutrients (QCLot: 620017)										
FJ2202261-017	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 620018)										
FJ2202261-017	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0476 mg/L	0.05 mg/L	95.3	70.0	130	----
Anions and Nutrients (QCLot: 620019)										
FJ2202261-017	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0950 mg/L	0.1 mg/L	95.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 620015)										
FJ2202261-017	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	4.87 mg/L	5 mg/L	97.3	70.0	130	----
Organic / Inorganic Carbon (QCLot: 620016)										
FJ2202261-017	Anonymous	carbon, total organic [TOC]	----	E355-L	5.45 mg/L	5 mg/L	109	70.0	130	----
Dissolved Metals (QCLot: 618257)										

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: 618257) - continued										
VA22B9691-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	8 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	2 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterquality/abdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions, SI, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~BEA~~			Water	4	R	R	R	R	R			
	~~PD2~~			Water	4	R	R	R	R	R			
	~~PINE~~			Water	4	R	R	R	R	R			
	~~PD1-A~~			Water	4	R	R	R	R	R			
	~~PD1-B~~			Water	4	R	R	R	R	R			
	~~PR-2.81~~			Water	4	R	R	R	R	R			
	MD	22-Aug-22	16:00	Water	4	R	R	R	R	R			
	~~MD-FB~~			Water	4	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2202273

Telephone : +1 250 261 5517

FJAE Shipping & Receiving
Mail 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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
	Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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		
1.2.3					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: BRM	Date: 22-Aug-2022	Time: 16:45	Received by:	Date: 8-22-22	Time: 9:43	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

ALS Lab Work Order # (ALS use only):

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINER	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~BEA~~			Water	4	R	R	R	R	R			
	~~PD2~~			Water	4	R	R	R	R	R			
	~~PINE~~			Water	4	R	R	R	R	R			
	~~PD1-A~~			Water	4	R	R	R	R	R			
	~~PD1-B~~			Water	4	R	R	R	R	R			
	~~PR-2.81~~			Water	4	R	R	R	R	R			
	MD	22-Aug-22	16:00	Water	4	R	R	R	R	R			
	~~MD-FB~~			Water	4	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2202273

Telephone : +1 250 261 5517

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

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
						8

SHIPMENT RELEASE (client use)

Released by: BRM Date: 22-Aug-2022 Time: 16:45

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: 8/23 Time: 3:40p

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202287**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 23-Aug-2022 18:54
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Aug-2022
C-O-C number	: 2022-Aug-Mon8/9-Day 4	Issue Date	: 09-Sep-2022 17:47
Sampler	: PD		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Erin Sanchez		Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Inorganics, 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*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Pouce	PD4	KR	PD3	----
					Client sampling date / time: 23-Aug-2022 10:05	23-Aug-2022 10:55	23-Aug-2022 12:40	23-Aug-2022 13:20	----
					FJ2202287-001	FJ2202287-002	FJ2202287-003	FJ2202287-004	--------
					Result	Result	Result	Result	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	184	88.3	192	88.9	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	9.0	<1.0	14.2	<1.0	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	4.5	<1.0	7.1	<1.0	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	193	88.3	206	88.9	----
colour, true	----	E329	5.0	CU	13.9	10.6	10.2	6.0	----
conductivity	----	E100	2.0	µS/cm	1100	192	420	192	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	416	106	208	102	----
pH	----	E108	0.10	pH units	8.40	8.15	8.54	8.17	----
solids, total dissolved [TDS]	----	E162	10	mg/L	908	124	282	133	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	10.1	29.7	<3.0	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0183	<0.0050	0.0052	<0.0050	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	21.8	<0.50	1.08	<0.50	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.252	0.038	0.106	0.037	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.530	0.077	0.324	0.080	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0250 DLDS	0.0543	<0.0050	0.0566	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0050 DLDS	0.0016	<0.0010	0.0016	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.523	0.145	0.301	0.136	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0120	0.0128	0.0222	0.0109	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0045	<0.0020	<0.0020	<0.0020	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	0.60	4.20	2.83	4.20	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	396	15.4	36.6	15.2	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	11.7	4.01	7.89	2.97	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	12.1	3.40	8.28	2.89	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	12.7	2.09	4.91	2.10	----
cation sum	----	EC101	0.10	meq/L	13.2	2.19	5.16	2.12	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Pouce	PD4	KR	PD3	----
					Client sampling date / time	23-Aug-2022 10:05	23-Aug-2022 10:55	23-Aug-2022 12:40	23-Aug-2022 13:20	----
						FJ2202287-001	**FJ2202287-002**	**FJ2202287-003**	**FJ2202287-004**	--------
						Result	Result	Result	Result	----
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		1.93	2.34	2.48	0.474	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		102	30.7	49.5	29.1	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		39.3	7.02	20.6	7.24	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202287**	Page	: 1 of 19
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 23-Aug-2022 18:54
PO	: 1200-25.03.02	Issue Date	: 09-Sep-2022 17:47
C-O-C number	: 2022-Aug-Mon8/9-Day 4		
Sampler	: PD		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) KR	E298	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD3	E298	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD4	E298	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pouce	E298	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE KR	E235.Cl	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD3	E235.Cl	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD4	E235.Cl	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE Pouce	E235.Cl	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE KR	E378-U	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD3	E378-U	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD4	E378-U	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Pouce	E378-U	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE KR	E235.F	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD3	E235.F	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD4	E235.F	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Pouce	E235.F	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE KR	E235.NO3-L	23-Aug-2022	25-Aug-2022	3 days	2 days	✓	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD3	E235.NO3-L	23-Aug-2022	25-Aug-2022	3 days	2 days	✓	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD4	E235.NO3-L	23-Aug-2022	25-Aug-2022	3 days	2 days	✓	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Pouce	E235.NO3-L	23-Aug-2022	25-Aug-2022	3 days	2 days	✓	25-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE KR	E235.NO2-L	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD3	E235.NO2-L	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD4	E235.NO2-L	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Pouce	E235.NO2-L	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE KR	E392	23-Aug-2022	----	----	----		25-Aug-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PD3	E392	23-Aug-2022	----	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD4	E392	23-Aug-2022	----	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Pouce	E392	23-Aug-2022	----	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE KR	E235.SO4	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD3	E235.SO4	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD4	E235.SO4	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Pouce	E235.SO4	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) KR	E375-T	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD3	E375-T	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD4	E375-T	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) Pouce	E375-T	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) KR	E318	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD3	E318	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD4	E318	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) Pouce	E318	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) KR	E366	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD3	E366	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD4	E366	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Pouce	E366	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
KR	E372-U	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD3	E372-U	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD4	E372-U	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Pouce	E372-U	23-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
KR	E421	23-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD3	E421	23-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD4	E421	23-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
Pouce	E421	23-Aug-2022	25-Aug-2022	----	----		26-Aug-2022	180 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) KR	E358-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD3	E358-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD4	E358-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Pouce	E358-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KR	E355-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD3	E355-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD4	E355-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Pouce	E355-L	23-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KR	E290	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD3	E290	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD4	E290	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Pouce	E290	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KR	E329	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD3	E329	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD4	E329	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Pouce	E329	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE KR	E100	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE PD3	E100	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PD4	E100	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Pouce	E100	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE KR	E108	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD3	E108	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD4	E108	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Pouce	E108	23-Aug-2022	25-Aug-2022	----	----		25-Aug-2022	0.25 hrs	3.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE KR	E162	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD3	E162	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD4	E162	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓

Matrix: **Water**

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

Analyte Group / 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 Pouce	E162	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE KR	E160	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD3	E160	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD4	E160	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Pouce	E160	23-Aug-2022	----	----	----		29-Aug-2022	7 days	6 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	617797	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624165	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	617801	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617808	1	6	16.6	5.0	✓
Conductivity in Water	E100	617798	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618486	1	13	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624168	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617807	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	617800	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617802	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617803	1	18	5.5	5.0	✓
pH by Meter	E108	617796	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617804	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	623212	2	40	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624170	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624166	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	624169	1	5	20.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624167	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624164	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	623197	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	617797	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624165	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	617801	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617808	1	6	16.6	5.0	✓
Conductivity in Water	E100	617798	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618486	1	13	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624168	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617807	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	617800	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617802	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617803	1	18	5.5	5.0	✓
pH by Meter	E108	617796	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617804	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	623212	2	40	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624170	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624166	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	624169	1	5	20.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624167	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624164	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	623197	2	40	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	617797	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624165	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	617801	1	19	5.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	617808	1	6	16.6	5.0	✓
Conductivity in Water	E100	617798	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618486	1	13	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624168	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617807	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	617800	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617802	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617803	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617804	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	623212	2	40	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624170	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624166	1	17	5.8	5.0	✓
Total Nitrogen by Colourimetry	E366	624169	1	5	20.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624167	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624164	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	623197	2	40	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	624165	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	617801	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	618486	1	13	7.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624168	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	617807	1	16	6.2	5.0	✓
Fluoride in Water by IC	E235.F	617800	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	617802	1	11	9.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	617803	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	619371	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	617804	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624170	1	4	25.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624166	1	17	5.8	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 Nitrogen by Colourimetry	E366	624169	1	5	20.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624167	1	16	6.2	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624164	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202287**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 23-Aug-2022 18:54
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Aug-2022
C-O-C number	: 2022-Aug-Mon8/9-Day 4	Issue Date	: 09-Sep-2022 17:47
Sampler	: PD		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Inorganics, 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: 617796)											
FJ2202287-001	Pouce	pH	----	E108	0.10	pH units	8.40	8.40	0.00%	4%	----
Physical Tests (QC Lot: 617797)											
FJ2202287-001	Pouce	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	184	184	0.380%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	9.0	8.4	0.6	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	4.5	4.2	0.3	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	193	193	0.0519%	20%	----
Physical Tests (QC Lot: 617798)											
FJ2202287-001	Pouce	conductivity	----	E100	2.0	µS/cm	1100	1090	0.548%	10%	----
Physical Tests (QC Lot: 617808)											
FJ2202287-001	Pouce	colour, true	----	E329	5.0	CU	13.9	15.3	1.4	Diff <2x LOR	----
Physical Tests (QC Lot: 623197)											
FJ2202287-002	PD4	solids, total suspended [TSS]	----	E160	3.0	mg/L	10.1	11.5	1.4	Diff <2x LOR	----
Physical Tests (QC Lot: 623212)											
FJ2202287-002	PD4	solids, total dissolved [TDS]	----	E162	13	mg/L	124	128	4	Diff <2x LOR	----
Physical Tests (QC Lot: 623501)											
FJ2202299-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 623508)											
FJ2202299-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	571	589	3.19%	20%	----
Anions and Nutrients (QC Lot: 617800)											
VA22B9769-001	Anonymous	fluoride	16984-48-8	E235.F	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 617801)											
VA22B9769-001	Anonymous	chloride	16887-00-6	E235.Cl	5.00	mg/L	377	376	0.236%	20%	----
Anions and Nutrients (QC Lot: 617802)											
VA22B9769-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0500	mg/L	2.50	2.48	0.862%	20%	----
Anions and Nutrients (QC Lot: 617803)											
VA22B9769-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0100	mg/L	0.0102	<0.0100	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 617804)											
VA22B9769-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	3.00	mg/L	116	115	0.394%	20%	----
Anions and Nutrients (QC Lot: 617807)											
FJ2202287-001	Pouce	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	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*
Anions and Nutrients (QC Lot: 619371)											
FJ2202227-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.39	6.38	0.142%	20%	----
Anions and Nutrients (QC Lot: 624164)											
FJ2202287-001	Pouce	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0120	0.0123	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624165)											
FJ2202287-001	Pouce	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0183	0.0194	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624166)											
FJ2202287-001	Pouce	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.530	0.514	3.08%	20%	----
Anions and Nutrients (QC Lot: 624169)											
FJ2202287-001	Pouce	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.523	0.532	1.70%	20%	----
Anions and Nutrients (QC Lot: 624170)											
FJ2202287-001	Pouce	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0045	0.0047	0.0002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 624167)											
FJ2202287-001	Pouce	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	12.1	12.4	2.70%	20%	----
Organic / Inorganic Carbon (QC Lot: 624168)											
FJ2202287-001	Pouce	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	11.7	12.2	4.81%	20%	----
Dissolved Metals (QC Lot: 618486)											
FJ2202295-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	34.9	36.0	3.28%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	7.69	7.91	2.83%	20%	----

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: 617797)						
alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	1.4	----
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	1.4	----
Physical Tests (QCLot: 617798)						
conductivity	----	E100	1	µS/cm	1.4	----
Physical Tests (QCLot: 617808)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 623197)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 623212)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 623501)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 623508)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 617800)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 617801)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 617802)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 617803)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 617804)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 617807)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 619371)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 624164)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 624165)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 624166)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 624169)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 624170)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 624167)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 624168)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 618486)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 617796)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 617797)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	103	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 617798)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	96.5	90.0	110	----
Physical Tests (QCLot: 617808)									
colour, true	----	E329	5	CU	100 CU	103	85.0	115	----
Physical Tests (QCLot: 623197)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	91.5	85.0	115	----
Physical Tests (QCLot: 623212)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	109	85.0	115	----
Physical Tests (QCLot: 623501)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	104	85.0	115	----
Physical Tests (QCLot: 623508)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 617800)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	96.7	90.0	110	----
Anions and Nutrients (QCLot: 617801)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 617802)									
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: 617803)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 617804)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 617807)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 619371)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 624164)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	91.2	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 624165)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 624166)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.2	75.0	125	----
Anions and Nutrients (QCLot: 624169)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 624170)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 624167)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	98.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 624168)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Dissolved Metals (QCLot: 618486)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	99.9	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: 617800)										
VA22B9819-001	Anonymous	fluoride	16984-48-8	E235.F	0.998 mg/L	1 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 617801)										
VA22B9819-001	Anonymous	chloride	16887-00-6	E235.Cl	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 617802)										
VA22B9819-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.65 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 617803)										
VA22B9819-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.495 mg/L	0.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 617804)										
VA22B9819-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	107 mg/L	100 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 617807)										
FJ2202287-002	PD4	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0296 mg/L	0.03 mg/L	98.6	70.0	130	----
Anions and Nutrients (QCLot: 619371)										
FJ2202227-002	Anonymous	silicate (as SiO2)	7631-86-9	E392	9.46 mg/L	10 mg/L	94.6	75.0	125	----
Anions and Nutrients (QCLot: 624164)										
FJ2202287-002	PD4	phosphorus, total	7723-14-0	E372-U	0.0488 mg/L	0.05 mg/L	97.6	70.0	130	----
Anions and Nutrients (QCLot: 624165)										
FJ2202287-002	PD4	ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 624166)										
FJ2202287-002	PD4	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 624169)										
FJ2202287-002	PD4	nitrogen, total	7727-37-9	E366	0.407 mg/L	0.4 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 624170)										
FJ2202287-002	PD4	phosphorus, total dissolved	7723-14-0	E375-T	0.0482 mg/L	0.05 mg/L	96.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 624167)										
FJ2202287-002	PD4	carbon, total organic [TOC]	----	E355-L	5.19 mg/L	5 mg/L	104	70.0	130	----
Organic / Inorganic Carbon (QCLot: 624168)										
FJ2202287-002	PD4	carbon, dissolved organic [DOC]	----	E358-L	4.16 mg/L	5 mg/L	83.3	70.0	130	----
Dissolved Metals (QCLot: 618486)										

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: 618486) - continued										
VA22B9732-001	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

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

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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 CONTAINER	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	Hardness (F/P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD5~~			~~Water~~	~~4~~ R	R	R	R	R	R			
	POUCE	23-AUG-22	10:05	Water	4	R	R	R	R	R			
	PD4	23-AUG-22	10:55	Water	4	R	R	R	R	R			
	KR	23-AUG-22	12:40	Water	4	R	R	R	R	R			
	PD3	23-AUG-22	13:20	Water	4	R	R	R	R	R			
	~~Travel Blank~~			~~Water~~	~~2~~ R				~~P~~ R				

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

Fort St. John
Work Order Reference
FJ2202287

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
4.0							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Aug 23, 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	8-23-22	16:45

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
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☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F/P)	Hardness (F/P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD5~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	POUCE	23-AUG-22	10:05	Water	4	R	R	R	R	R			
	PD4	23-AUG-22	10:55	Water	4	R	R	R	R	R			
	KR	23-AUG-22	12:40	Water	4	R	R	R	R	R			
	PD3	23-AUG-22	13:20	Water	4	R	R	R	R	R			
	~~Travel Blank~~			~~Water~~	~~2~~	~~R~~			~~R~~				

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

Fort St. John
Work Order Reference
FJ2202287

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
9.0 C							2

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Aug 23, 2022	Time:	Received by:	Date: 8-23-22	Time: 16:40	Received by:	Date: 8/24	Time: 0900

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202313**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Aug-2022 08:07
PO	: 1200-25.03.02	Date Analysis Commenced	: 27-Aug-2022
C-O-C number	: 2022-Aug-Mon8/9-Day 4	Issue Date	: 09-Sep-2022 17:48
Sampler	: PB		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, 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*
-	No Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: PD5	MD-FB	Travel Blank	----	----
					Client sampling date / time: 24-Aug-2022 08:55	24-Aug-2022 12:00	[24-Aug-2022]	----	----
					FJ2202313-001	FJ2202313-002	FJ2202313-003	--------	--------
					Result	Result	Result	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	89.9	1.0	<1.0	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	89.9	1.0	<1.0	----	----
colour, true	----	E329	5.0	CU	6.8	<5.0	<5.0	----	----
conductivity	----	E100	2.0	µS/cm	193	<2.0	<2.0	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	105	<0.60	----	----	----
pH	----	E108	0.10	pH units	8.20	5.69	5.59	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	116	<10	<10	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	<3.0	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0.0071 RRV	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	<0.50	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.043	<0.020	<0.020	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.094	<0.050	<0.050	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0499	<0.0050	<0.0050	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0016	<0.0010	<0.0010	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L	0.155	<0.030	<0.030	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0017	<0.0010	<0.0010	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0114	<0.0020	<0.0020	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.17	<0.50	<0.50	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.9	<0.30	<0.30	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.95	<0.50	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.09	<0.50	<0.50	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.11	<0.10	----	----	----
cation sum	----	EC101	0.10	meq/L	2.18	<0.10	----	----	----

Analytical Results

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

					Client sample ID	PD5	MD-FB	Travel Blank	----	----
					Client sampling date / time	24-Aug-2022 08:55	24-Aug-2022 12:00	[24-Aug-2022]	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2202313-001	FJ2202313-002	FJ2202313-003	--------	--------
						Result	Result	Result	----	----
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		1.63	<0.010	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		30.2	<0.050	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		7.21	<0.0050	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202313**	Page	: 1 of 16
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Aug-2022 08:07
PO	: 1200-25.03.02	Issue Date	: 09-Sep-2022 17:49
C-O-C number	: 2022-Aug-Mon8/9-Day 4		
Sampler	: PB		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MD-FB	E298	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5	E298	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Travel Blank	E298	24-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MD-FB	E235.Cl	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5	E235.Cl	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Travel Blank	E235.Cl	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD-FB	E378-U	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5	E378-U	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Travel Blank	E378-U	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD-FB	E235.F	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5	E235.F	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Travel Blank	E235.F	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD-FB	E235.NO3-L	24-Aug-2022	27-Aug-2022	3 days	3 days	✓	27-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5	E235.NO3-L	24-Aug-2022	27-Aug-2022	3 days	3 days	✓	27-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO3-L	24-Aug-2022	27-Aug-2022	3 days	3 days	✓	27-Aug-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD-FB	E235.NO2-L	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrite in Water by IC (Low Level)										
HDPE PD5	E235.NO2-L	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO2-L	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MD-FB	E392	24-Aug-2022	----	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD5	E392	24-Aug-2022	----	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Travel Blank	E392	24-Aug-2022	----	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MD-FB	E235.SO4	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5	E235.SO4	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Travel Blank	E235.SO4	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD-FB	E375-T	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PD5	E375-T	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
MD-FB	E318	24-Aug-2022	30-Aug-2022	----	----		01-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
PD5	E318	24-Aug-2022	30-Aug-2022	----	----		01-Sep-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
Travel Blank	E318	24-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
MD-FB	E366	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
PD5	E366	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Travel Blank	E366	24-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
MD-FB	E372-U	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PD5	E372-U	24-Aug-2022	30-Aug-2022	----	----		31-Aug-2022	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Travel Blank	E372-U	24-Aug-2022	01-Sep-2022	----	----		02-Sep-2022	28 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
MD-FB	E421	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
PD5	E421	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	180 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
MD-FB	E358-L	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
PD5	E358-L	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MD-FB	E355-L	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
PD5	E355-L	24-Aug-2022	30-Aug-2022	----	----		30-Aug-2022	28 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
Travel Blank	E355-L	24-Aug-2022	01-Sep-2022	----	----		01-Sep-2022	28 days	8 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MD-FB	E290	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	14 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD5	E290	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	14 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE MD-FB	E329	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD5	E329	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Travel Blank	E329	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	3 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE MD-FB	E100	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD5	E100	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE MD-FB	E108	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	0.25 hrs	7.25 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD5	E108	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	0.25 hrs	7.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	24-Aug-2022	27-Aug-2022	----	----		27-Aug-2022	0.25 hrs	7.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE MD-FB	E162	24-Aug-2022	----	----	----		31-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD5	E162	24-Aug-2022	----	----	----		30-Aug-2022	7 days	7 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Travel Blank	E162	24-Aug-2022	----	----	----		30-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD-FB	E160	24-Aug-2022	----	----	----		31-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD5	E160	24-Aug-2022	----	----	----		30-Aug-2022	7 days	7 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	24-Aug-2022	----	----	----		30-Aug-2022	7 days	7 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	621468	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624520	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	621462	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	621470	1	3	33.3	5.0	✓
Conductivity in Water	E100	621469	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	622631	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624515	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	621460	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	621461	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	621464	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	621465	1	12	8.3	5.0	✓
pH by Meter	E108	621467	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	627591	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	621466	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	626133	2	39	5.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624519	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624514	2	18	11.1	5.0	✓
Total Nitrogen by Colourimetry	E366	624517	2	30	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624516	2	23	8.7	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624518	2	29	6.9	5.0	✓
TSS by Gravimetry	E160	626137	2	39	5.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	621468	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624520	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	621462	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	621470	1	3	33.3	5.0	✓
Conductivity in Water	E100	621469	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	622631	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624515	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	621460	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	621461	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	621464	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	621465	1	12	8.3	5.0	✓
pH by Meter	E108	621467	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	627591	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	621466	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	626133	2	39	5.1	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624519	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624514	2	18	11.1	5.0	✓
Total Nitrogen by Colourimetry	E366	624517	2	30	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624516	2	23	8.7	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624518	2	29	6.9	5.0	✓
TSS by Gravimetry	E160	626137	2	39	5.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	621468	1	8	12.5	5.0	✓
Ammonia by Fluorescence	E298	624520	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	621462	1	12	8.3	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	621470	1	3	33.3	5.0	✓
Conductivity in Water	E100	621469	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	622631	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624515	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	621460	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	621461	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	621464	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	621465	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	627591	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	621466	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	626133	2	39	5.1	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624519	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624514	2	18	11.1	5.0	✓
Total Nitrogen by Colourimetry	E366	624517	2	30	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624516	2	23	8.7	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624518	2	29	6.9	5.0	✓
TSS by Gravimetry	E160	626137	2	39	5.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	624520	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	621462	1	12	8.3	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	622631	1	10	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	624515	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	621460	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	621461	1	12	8.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	621464	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	621465	1	12	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	627591	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	621466	1	12	8.3	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	624519	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	624514	2	18	11.1	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 Nitrogen by Colourimetry	E366	624517	2	30	6.6	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	624516	2	23	8.7	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	624518	2	29	6.9	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Vancouver - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Vancouver - Environmental	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.
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Vancouver - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Vancouver - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Colour (True) by Spectrometer (5 CU)	E329 Vancouver - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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 Vancouver - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Vancouver - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Vancouver - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Vancouver - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Vancouver - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Vancouver - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 Vancouver - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Vancouver - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202313**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 25-Aug-2022 08:07
PO	: 1200-25.03.02	Date Analysis Commenced	: 27-Aug-2022
C-O-C number	: 2022-Aug-Mon8/9-Day 4	Issue Date	: 09-Sep-2022 17:49
Sampler	: PB		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, 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: 621467)											
FJ2202313-001	PD5	pH	----	E108	0.10	pH units	8.20	8.16	0.489%	4%	----
Physical Tests (QC Lot: 621468)											
FJ2202313-001	PD5	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	89.9	89.2	0.782%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	89.9	89.2	0.782%	20%	----
Physical Tests (QC Lot: 621469)											
FJ2202313-001	PD5	conductivity	----	E100	2.0	µS/cm	193	194	0.361%	10%	----
Physical Tests (QC Lot: 621470)											
FJ2202313-001	PD5	colour, true	----	E329	5.0	CU	6.8	7.5	0.7	Diff <2x LOR	----
Physical Tests (QC Lot: 626133)											
FJ2202313-001	PD5	solids, total dissolved [TDS]	----	E162	13	mg/L	116	118	2	Diff <2x LOR	----
Physical Tests (QC Lot: 626137)											
FJ2202313-001	PD5	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 627022)											
FJ2202313-002	MD-FB	solids, total dissolved [TDS]	----	E162	10	mg/L	<10	<10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 627036)											
FJ2202313-002	MD-FB	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621460)											
FJ2202313-001	PD5	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0017	0.0014	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621461)											
FJ2202312-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.086	0.083	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621462)											
FJ2202312-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621464)											
FJ2202312-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0197	0.0200	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621465)											
FJ2202312-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 621466)											
FJ2202312-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	73.8	73.5	0.443%	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*
Anions and Nutrients (QC Lot: 624514)											
FJ2202313-001	PD5	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.094	0.091	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624517)											
FJ2202313-001	PD5	nitrogen, total	7727-37-9	E366	0.030	mg/L	0.155	0.156	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624518)											
FJ2202313-001	PD5	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0114	0.0147	0.0033	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624519)											
FJ2202313-001	PD5	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 624520)											
FJ2202313-001	PD5	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 627591)											
EO2206998-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	2.89	2.88	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628489)											
FJ2202313-003	Travel Blank	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628490)											
FJ2202313-003	Travel Blank	nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628491)											
FJ2202313-003	Travel Blank	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 628492)											
FJ2202313-003	Travel Blank	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0071	0.0068	0.0002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 624515)											
FJ2202313-001	PD5	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.95	3.25	0.30	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 624516)											
FJ2202313-001	PD5	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.09	3.08	0.005	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 628554)											
FJ2202313-003	Travel Blank	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 622631)											
VA22B9855-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	38.8	39.7	2.40%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	7.77	7.50	3.59%	20%	----

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: 621468)						
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: 621469)						
conductivity	----	E100	1	µS/cm	1.4	----
Physical Tests (QCLot: 621470)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 626133)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 626137)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 627022)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 627036)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 621460)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 621461)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 621462)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 621464)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 621465)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 621466)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 624514)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 624517)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 624518)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 624519)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 624520)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 627591)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 628489)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 628490)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 628491)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 628492)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 624515)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 624516)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 628554)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 622631)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 621467)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 621468)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	110	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	111	85.0	115	----
Physical Tests (QCLot: 621469)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.1	90.0	110	----
Physical Tests (QCLot: 621470)									
colour, true	----	E329	5	CU	100 CU	103	85.0	115	----
Physical Tests (QCLot: 626133)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	107	85.0	115	----
Physical Tests (QCLot: 626137)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	95.0	85.0	115	----
Physical Tests (QCLot: 627022)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	105	85.0	115	----
Physical Tests (QCLot: 627036)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	99.8	85.0	115	----
Anions and Nutrients (QCLot: 621460)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	104	80.0	120	----
Anions and Nutrients (QCLot: 621461)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.6	90.0	110	----
Anions and Nutrients (QCLot: 621462)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 621464)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 621465)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 621466)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 624514)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	96.0	75.0	125	----
Anions and Nutrients (QCLot: 624517)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	102	75.0	125	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 624518)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.6	80.0	120	----
Anions and Nutrients (QCLot: 624519)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.4	80.0	120	----
Anions and Nutrients (QCLot: 624520)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.9	85.0	115	----
Anions and Nutrients (QCLot: 627591)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	99.0	85.0	115	----
Anions and Nutrients (QCLot: 628489)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	94.1	75.0	125	----
Anions and Nutrients (QCLot: 628490)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 628491)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.8	80.0	120	----
Anions and Nutrients (QCLot: 628492)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.5	85.0	115	----
Organic / Inorganic Carbon (QCLot: 624515)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 624516)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	107	80.0	120	----
Organic / Inorganic Carbon (QCLot: 628554)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	95.3	80.0	120	----
Dissolved Metals (QCLot: 622631)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.8	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: 621460)										
FJ2202313-002	MD-FB	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0306 mg/L	0.03 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 621461)										
FJ2202312-002	Anonymous	fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 621462)										
FJ2202312-002	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 621464)										
FJ2202312-002	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.66 mg/L	2.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 621465)										
FJ2202312-002	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.507 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 621466)										
FJ2202312-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 624514)										
FJ2202313-002	MD-FB	Kjeldahl nitrogen, total [TKN]	----	E318	2.38 mg/L	2.5 mg/L	95.2	70.0	130	----
Anions and Nutrients (QCLot: 624517)										
FJ2202313-002	MD-FB	nitrogen, total	7727-37-9	E366	0.401 mg/L	0.4 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 624518)										
FJ2202313-002	MD-FB	phosphorus, total	7723-14-0	E372-U	0.0463 mg/L	0.05 mg/L	92.7	70.0	130	----
Anions and Nutrients (QCLot: 624519)										
FJ2202313-002	MD-FB	phosphorus, total dissolved	7723-14-0	E375-T	0.0495 mg/L	0.05 mg/L	99.0	70.0	130	----
Anions and Nutrients (QCLot: 624520)										
FJ2202313-002	MD-FB	ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 627591)										
FJ2202313-001	PD5	silicate (as SiO2)	7631-86-9	E392	10.2 mg/L	10 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 628489)										
VA22B9712-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.39 mg/L	2.5 mg/L	95.8	70.0	130	----
Anions and Nutrients (QCLot: 628490)										
FJ2202321-001	Anonymous	nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 628491)										

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: 628491) - continued										
FJ2202321-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0461 mg/L	0.05 mg/L	92.1	70.0	130	----
Anions and Nutrients (QCLot: 628492)										
FJ2202321-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Organic / Inorganic Carbon (QCLot: 624515)										
FJ2202313-002	MD-FB	carbon, dissolved organic [DOC]	----	E358-L	4.94 mg/L	5 mg/L	98.9	70.0	130	----
Organic / Inorganic Carbon (QCLot: 624516)										
FJ2202313-002	MD-FB	carbon, total organic [TOC]	----	E355-L	5.01 mg/L	5 mg/L	100	70.0	130	----
Organic / Inorganic Carbon (QCLot: 628554)										
KS2203134-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.28 mg/L	5 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 622631)										
VA22B9855-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	8 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	2 mg/L	ND	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	*Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.*

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Aug-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

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

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

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F/P)	Hardness (P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	HOLD NO S	STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PD5	24 AUG 22	08:55	Water	4	R	R	R	R	R			
	~~PD6~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~PD4~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~KR~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~PD3~~ MD-FB	24 AUG 22	12:00	~~Water~~ VHF	4	R	R	R	R	R			
	Travel Blank	—	—	Water	2	R			R	R			

Telephone : +1 250 261 5517

Work Order Reference FJ2202313

Fort St. John

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

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
5.6	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Aug 24, 2022	Time:	Received by: RICK	Date: 8.25.22	Time: 8:45	Received by:	Date:	Time:

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

AUG 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202608**	Page	: 1 of 6
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Sep-2022 14:46
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Sep-2022
C-O-C number	: ----	Issue Date	: 28-Sep-2022 16:57
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter		Metals, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
SFT	*Sample was filtered due to turbidity interference. Result reflects soluble analyte concentration.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD2	BEA	PD3	KR	PD4
					Client sampling date / time	19-Sep-2022 08:50	19-Sep-2022 09:40	19-Sep-2022 10:30	19-Sep-2022 11:15	19-Sep-2022 12:05
						FJ2202608-001	FJ2202608-002	FJ2202608-003	FJ2202608-004	FJ2202608-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		86.7	149	86.1	206	90.7
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	10.4	<1.0
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	5.2	<1.0
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		86.7	149	86.1	216	90.7
colour, true	----	E329	5.0	CU		6.1	118	6.5	11.4	5.6
conductivity	----	E100	2.0	µS/cm		182	386	185	539	188
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		92.0	149	96.4	169	96.7
pH	----	E108	0.10	pH units		8.06	8.24	8.08	8.43	8.10
solids, total dissolved [TDS]	----	E162	10	mg/L		108	283	104	365	108
solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	<3.0	<3.0	24.8	<3.0
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	0.0091	0.0109	0.0157	0.0060
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	2.65	<0.50	2.29	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.034	0.134	0.036	0.180	0.036
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.104	0.764	0.088	1.01	0.106
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0527	<0.0050	0.0527	0.283	0.0480
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0017	<0.0010	0.0015	0.0053	0.0013
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.158	0.764	0.142	1.30	0.155
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0015	0.0041	0.0016	0.0019	0.0016
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0100	0.0356	0.0105	0.231	0.0124
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	0.0111	<0.0020	0.0256	<0.0020
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.15	3.52 SFT	4.10	0.79 SFT	4.00
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		13.6	66.2	14.0	92.4	14.6
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.78	26.5	2.85	8.00	2.70
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		3.16	28.9	2.64	10.5	2.81
Ion Balance										
anion sum	----	EC101	0.10	meq/L		2.02	4.44	2.02	6.33	2.12
cation sum	----	EC101	0.10	meq/L		1.90	4.42	2.00	6.21	2.01

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD2	BEA	PD3	KR	PD4
					Client sampling date / time	19-Sep-2022 08:50	19-Sep-2022 09:40	19-Sep-2022 10:30	19-Sep-2022 11:15	19-Sep-2022 12:05
						FJ2202608-001	FJ2202608-002	FJ2202608-003	FJ2202608-004	FJ2202608-005
						Result	Result	Result	Result	Result
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		3.06	0.226	0.498	0.957	2.66
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		25.6	39.3	27.1	37.2	26.9
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.81	12.3	6.97	18.6	7.18
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	POUCE	----	----	----	----
					Client sampling date / time	19-Sep-2022 12:40	----	----	----	----
					FJ2202608-006	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		207	----	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		8.2	----	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	----	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		4.1	----	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		216	----	----	----	----
colour, true	----	E329	5.0	CU		12.6	----	----	----	----
conductivity	----	E100	2.0	µS/cm		1180	----	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		403	----	----	----	----
pH	----	E108	0.10	pH units		8.40	----	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		853	----	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0068	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		28.8	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.224	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.561	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0679	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0050 DLDS	----	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.629	----	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0016	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0167	----	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		0.0026	----	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		1.19	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		427	----	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		12.1	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		11.9	----	----	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L		14.0	----	----	----	----
cation sum	----	EC101	0.10	meq/L		13.9	----	----	----	----
ion balance (APHA)	----	EC101	0.010	%		0.358	----	----	----	----

Analytical Results

Sub-Matrix: **Water** (Matrix: **Water**)					Client sample ID	**POUCE**	----	----	----	----
					Client sampling date / time	19-Sep-2022 12:40	----	----	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*		**FJ2202608-006**	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		92.7	----	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		41.6	----	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	----	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202608**	Page	: 1 of 21
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Sep-2022 14:46
PO	: 1200-25.03.02	Issue Date	: 28-Sep-2022 16:58
C-O-C number	: ----		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
BEA	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
KR	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD2	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD3	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PD4	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
POUCE	E298	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
BEA	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE KR	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD3	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD4	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE POUCE	E235.Cl	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE KR	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD3	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD4	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE POUCE	E378-U	19-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE KR	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD3	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD4	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE POUCE	E235.F	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE KR	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD3	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD4	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE POUCE	E235.NO3-L	19-Sep-2022	21-Sep-2022	3 days	2 days	✓	21-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE BEA	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE KR	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD2	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD3	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrite in Water by IC (Low Level)										
HDPE PD4	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE POUCE	E235.NO2-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE BEA	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE KR	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD2	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD3	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD4	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE POUCE	E392	19-Sep-2022	----	----	----		22-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE KR	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD3	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD4	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE POUCE	E235.SO4	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) KR	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD3	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD4	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) POUCE	E375-T	19-Sep-2022	23-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) BEA	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) KR	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD2	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD3	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD4	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) POUCE	E318	19-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) KR	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD3	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD4	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) POUCE	E372-U	19-Sep-2022	22-Sep-2022	----	----		25-Sep-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEA	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) KR	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD2	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD3	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD4	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) POUCE	E421	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	180 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) KR	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD3	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD4	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) POUCE	E358-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KR	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD3	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD4	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) POUCE	E355-L	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KR	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD3	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD4	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE POUCE	E290	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE BEA	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KR	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD3	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD4	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE POUCE	E329	19-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE KR	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD3	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD4	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE POUCE	E100	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE BEA	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE KR	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD2	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD3	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PD4	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE POUCE	E108	19-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE KR	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD3	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD4	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE POUCE	E162	19-Sep-2022	----	----	----		22-Sep-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE KR	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD3	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD4	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE POUCE	E160	19-Sep-2022	----	----	----		23-Sep-2022	7 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	663940	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	657878	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	663939	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664252	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	659566	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
pH by Meter	E108	663938	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	660946	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	661979	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	660033	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	660111	2	40	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	663940	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	657878	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	663939	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664252	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	659566	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
pH by Meter	E108	663938	1	17	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	660946	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	661979	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	660033	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	660111	2	40	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	663940	1	16	6.2	5.0	✓
Ammonia by Fluorescence	E298	657878	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	663939	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664252	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	659566	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	660946	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	661979	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	660033	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	660111	2	40	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	657878	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664252	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	659566	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	660946	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	661979	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	660033	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	660111	2	40	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202608**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 19-Sep-2022 14:46
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Sep-2022
C-O-C number	: ----	Issue Date	: 28-Sep-2022 16:57
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter		Calgary Metals, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 658118)											
CG2212867-007	Anonymous	solids, total dissolved [TDS]	----	E162	10	mg/L	<10	<10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 658631)											
FJ2202603-001	Anonymous	colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 661507)											
FJ2202608-001	PD2	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 663938)											
CG2212783-022	Anonymous	pH	----	E108	0.10	pH units	7.98	8.01	0.375%	4%	----
Physical Tests (QC Lot: 663939)											
CG2212783-023	Anonymous	conductivity	----	E100	2.0	µS/cm	99.6	98.7	0.908%	10%	----
Physical Tests (QC Lot: 663940)											
CG2212783-023	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	59.0	62.7	6.08%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	59.0	62.7	6.08%	20%	----
Anions and Nutrients (QC Lot: 657787)											
CG2212850-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.169	0.171	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 657790)											
CG2212850-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	12.3	12.4	0.438%	20%	----
Anions and Nutrients (QC Lot: 657791)											
CG2212850-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0038	0.0038	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 657792)											
CG2212850-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	205	206	0.485%	20%	----
Anions and Nutrients (QC Lot: 657793)											
FJ2202608-001	PD2	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 657878)											
FJ2202608-001	PD2	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 659566)											
CG2212844-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0031	0.0030	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 660033)											
CG2212932-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	1.07	1.04	2.92%	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*
Anions and Nutrients (QC Lot: 660111)											
FC2202240-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0457	0.0468	2.48%	20%	----
Anions and Nutrients (QC Lot: 660112)											
FJ2202608-006	POUCE	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0167	0.0167	0.00004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 660946)											
EO2207790-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	11.6	11.5	0.618%	20%	----
Anions and Nutrients (QC Lot: 661979)											
FC2202257-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0032	0.0029	0.0003	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 657267)											
FJ2202608-001	PD2	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.78	2.78	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 657271)											
FJ2202608-001	PD2	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.16	3.01	0.14	Diff <2x LOR	----
Dissolved Metals (QC Lot: 664252)											
CG2212922-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	66.6	65.5	1.69%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	29.9	29.3	1.88%	20%	----

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: 658118)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 658631)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 661507)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 663939)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 663940)						
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	----
Anions and Nutrients (QCLot: 657787)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 657790)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 657791)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 657792)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 657793)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 657878)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 659566)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 660033)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 660111)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 660112)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 660946)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 661979)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 657267)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 657271)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 664252)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 658118)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	97.9	85.0	115	----
Physical Tests (QCLot: 658631)									
colour, true	----	E329	5	CU	100 CU	101	85.0	115	----
Physical Tests (QCLot: 661507)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.2	85.0	115	----
Physical Tests (QCLot: 663938)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 663939)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	103	90.0	110	----
Physical Tests (QCLot: 663940)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	99.4	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 657787)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 657790)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 657791)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 657792)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 657793)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 657878)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 659566)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	99.7	80.0	120	----
Anions and Nutrients (QCLot: 660033)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 660111)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	110	80.0	120	----
Anions and Nutrients (QCLot: 660112)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	110	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 660946)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 661979)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 657267)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	93.7	80.0	120	----
Organic / Inorganic Carbon (QCLot: 657271)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Dissolved Metals (QCLot: 664252)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.4	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	105	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: 657787)										
CG2212854-001	Anonymous	fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 657790)										
CG2212854-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.53 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 657791)										
CG2212854-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 657792)										
CG2212854-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 657793)										
FJ2202608-002	BEA	chloride	16887-00-6	E235.Cl	95.4 mg/L	100 mg/L	95.4	75.0	125	----
Anions and Nutrients (QCLot: 657878)										
FJ2202608-002	BEA	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 659566)										
CG2212844-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0515 mg/L	0.05 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 660033)										
CG2212932-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.60 mg/L	2.5 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 660111)										
FC2202241-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 660112)										
SK2205149-001	Anonymous	phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 660946)										
EO2207790-002	Anonymous	silicate (as SiO2)	7631-86-9	E392	ND mg/L	10 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 661979)										
FC2202258-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0473 mg/L	0.05 mg/L	94.7	70.0	130	----
Organic / Inorganic Carbon (QCLot: 657267)										
FJ2202608-001	PD2	carbon, dissolved organic [DOC]	----	E358-L	4.77 mg/L	5 mg/L	95.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 657271)										
FJ2202608-001	PD2	carbon, total organic [TOC]	----	E355-L	4.92 mg/L	5 mg/L	98.4	70.0	130	----
Dissolved Metals (QCLot: 664252)										

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: 664252) - continued										
CG2212922-002	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Sept-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES / NO
	Copy of Invoice with Report YES / NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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 lhull@ecofishresearch.com
Email 2 tkasubuchi@ecofishresearch.com
Email 3 waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: EMAIL / MAIL / FAX
Email 1 or Fax accountspayable@ecofishresearch.com
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 minimum
- 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
  Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

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

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare

Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (F)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PG1~~ PD2	19 SEP 22	08:50	Water	4	R	R	R	R	R			
	~~PR1~~ BEA	19 SEP 22	09:40	Water	4	R	R	R	R	R			
	~~PR2~~ PD3	19 SEP 22	10:30	Water	4	R	R	R	R	R			
	~~HB-A~~ KR	19 SEP 22	11:15	Water	4	R	R	R	R	R			
	~~HB-B~~ PD4	19 SEP 22	12:05	Water	4	R	R	R	R	R			
	~~PR-2.84-A~~ POUCE	19 SEP 22	12:40	Water	4	R	R	R	R	R			
	~~PR-2.84-B~~			~~Water~~	4	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			

Fort St. John
Work Order Reference
FJ2202608

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? YES / NO

Are samples for human consumption/ use? YES / NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

qmann@azimuthgroup.ca jmcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
9.1°C							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Sept 19, 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	9-19-22	2:46

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202622**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 20-Sep-2022 11:40
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Sep-2022
C-O-C number	: 2022-sept-MON8/9-Day2	Issue Date	: 06-Jun-2023 14:39
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	CG Calgary - Environmental	2559 29th Street NE, Calgary, Alberta
B	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID: MD	PR3-A	PR3-B	----	----
						Client sampling date / time: 20-Sep-2022 09:25	20-Sep-2022 10:35	20-Sep-2022 10:35	----	----
						FJ2202622-001	FJ2202622-002	FJ2202622-003	--------	--------
						Result	Result	Result	----	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L	166	84.1	86.5	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L	6.0	<1.0	<1.0	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/CG	A	1.0	mg/L	<1.0	<1.0	<1.0	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/CG	A	1.0	mg/L	3.0	<1.0	<1.0	----	----
Alkalinity, total (as CaCO3)	----	E290/CG	A	1.0	mg/L	172	84.1	86.5	----	----
Colour, true	----	E329/CG	A	5.0	CU	5.3	6.6	7.0	----	----
Conductivity	----	E100/CG	A	2.0	µS/cm	339	175	175	----	----
Hardness (as CaCO3), dissolved	----	EC100/CG		0.60	mg/L	174	87.4	86.9	----	----
pH	----	E108/CG	A	0.10	pH units	8.34	7.99	7.99	----	----
Solids, total dissolved [TDS]	----	E162/CG	A	10	mg/L	192	97	110	----	----
Solids, total suspended [TSS]	----	E160/CG	A	3.0	mg/L	<3.0	<3.0	<3.0	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/CG	A	0.0050	mg/L	<0.0050	<0.0050	<0.0050	----	----
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L	0.54	<0.50	<0.50	----	----
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L	0.086	0.033	0.033	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/CG	A	0.050	mg/L	0.146	0.092	0.129	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	A	0.0050	mg/L	<0.0050	0.0561	0.0566	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	A	0.0010	mg/L	<0.0010	0.0017	0.0018	----	----
Nitrogen, total	7727-37-9	EC368/CG		0.050	mg/L	0.146	0.150	0.187	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/CG	A	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----
Phosphorus, total	7723-14-0	E372-U/CG	A	0.0020	mg/L	0.0048	0.0050	0.0046	----	----
Phosphorus, total dissolved	7723-14-0	E375-T/CG	A	0.0020	mg/L	<0.0020	<0.0020	<0.0020	----	----
Silicate (as SiO2)	7631-86-9	E392/VA	B	0.50	mg/L	3.81	4.11	4.11	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L	21.4	12.8	12.8	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/CG	A	0.50	mg/L	3.93	3.29	3.19	----	----
Carbon, total organic [TOC]	----	E355-L/CG	A	0.50	mg/L	3.51	3.14	3.07	----	----

Analytical Results

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

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	MD	PR3-A	PR3-B	----	----
						Client sampling date / time	20-Sep-2022 09:25	20-Sep-2022 10:35	20-Sep-2022 10:35	----	----
							FJ2202622-001	FJ2202622-002	FJ2202622-003	--------	--------
							Result	Result	Result	----	----
Ion Balance											
Anion sum	----	EC101/CG		0.10	meq/L		3.90	1.95	2.00	----	----
Cation sum	----	EC101/CG		0.10	meq/L		3.74	1.80	1.79	----	----
Ion balance (APHA)	----	EC101/CG		0.010	%		2.09	4.00	5.54	----	----
Dissolved Metals											
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L		48.1	25.2	25.1	----	----
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L		13.2	5.95	5.89	----	----
Dissolved metals filtration location	----	EP421/CG		-	-		Laboratory	Laboratory	Laboratory	----	----

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	: **FJ2202622**	Page	: 1 of 16
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 20-Sep-2022 11:40
PO	: 1200-25.03.02	Issue Date	: 06-Jun-2023 14:40
C-O-C number	: 2022-sept-MON8/9-Day2		
Sampler	: PAT BEAUPRE		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
MD	E298	20-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PR3-A	E298	20-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
PR3-B	E298	20-Sep-2022	22-Sep-2022	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
MD	E235.Cl	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
PR3-A	E235.Cl	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
PR3-B	E235.Cl	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD	E378-U	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3-A	E378-U	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3-B	E378-U	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD	E235.F	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3-A	E235.F	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3-B	E235.F	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD	E235.NO3-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR3-A	E235.NO3-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR3-B	E235.NO3-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD	E235.NO2-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3-A	E235.NO2-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3-B	E235.NO2-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MD	E392	20-Sep-2022	----	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR3-A	E392	20-Sep-2022	----	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR3-B	E392	20-Sep-2022	----	----	----		22-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MD	E235.SO4	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3-A	E235.SO4	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3-B	E235.SO4	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD	E375-T	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3-A	E375-T	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3-B	E375-T	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) MD	E318	20-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR3-A	E318	20-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR3-B	E318	20-Sep-2022	24-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MD	E372-U	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3-A	E372-U	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3-B	E372-U	20-Sep-2022	23-Sep-2022	----	----		26-Sep-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MD	E421	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR3-A	E421	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR3-B	E421	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	180 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MD	E358-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3-A	E358-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3-B	E358-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MD	E355-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3-A	E355-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3-B	E355-L	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MD	E290	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3-A	E290	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3-B	E290	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE MD	E329	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR3-A	E329	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR3-B	E329	20-Sep-2022	21-Sep-2022	----	----		21-Sep-2022	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE MD	E100	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3-A	E100	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Conductivity in Water										
HDPE PR3-B	E100	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE MD	E108	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3-A	E108	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3-B	E108	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.26 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE MD	E162	20-Sep-2022	----	----	----		22-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR3-A	E162	20-Sep-2022	----	----	----		22-Sep-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR3-B	E162	20-Sep-2022	----	----	----		22-Sep-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD	E160	20-Sep-2022	----	----	----		23-Sep-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3-A	E160	20-Sep-2022	----	----	----		23-Sep-2022	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE										
PR3-B	E160	20-Sep-2022	----	----	----		23-Sep-2022	7 days	3 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	664706	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	660421	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	664705	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664934	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
pH by Meter	E108	664704	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	660946	2	37	5.4	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	662375	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662642	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	662384	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	664706	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	660421	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	664705	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664934	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
pH by Meter	E108	664704	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	660946	2	37	5.4	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	662375	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662642	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	662384	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	664706	1	13	7.6	5.0	✓
Ammonia by Fluorescence	E298	660421	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	658631	1	12	8.3	5.0	✓
Conductivity in Water	E100	664705	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664934	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	660946	2	37	5.4	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	658118	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	662375	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662642	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	662384	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	661507	1	15	6.6	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	660421	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	657793	1	11	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	664934	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	657267	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	657787	1	16	6.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	657790	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	657791	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	660946	2	37	5.4	5.0	✓
Sulfate in Water by IC	E235.SO4	657792	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	662375	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662642	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	657271	1	11	9.0	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U	662384	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202622**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 20-Sep-2022 11:40
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Sep-2022
C-O-C number	: 2022-sept-MON8/9-Day2	Issue Date	: 06-Jun-2023 14:40
Sampler	: PAT BEAUPRE 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Naeun Kim	Analyst	Calgary Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 658118)											
CG2212867-007	Anonymous	Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	<10	0	Diff <2x LOR	----
Physical Tests (QC Lot: 658631)											
FJ2202603-001	Anonymous	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 661507)											
FJ2202608-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 664704)											
CG2212925-001	Anonymous	pH	----	E108	0.10	pH units	7.66	7.67	0.130%	4%	----
Physical Tests (QC Lot: 664705)											
CG2212925-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	675	674	0.148%	10%	----
Physical Tests (QC Lot: 664706)											
CG2212925-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	486	496	2.02%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		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	486	496	2.02%	20%	----
Anions and Nutrients (QC Lot: 657787)											
CG2212850-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.169	0.171	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 657790)											
CG2212850-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	12.3	12.4	0.438%	20%	----
Anions and Nutrients (QC Lot: 657791)											
CG2212850-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0038	0.0038	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 657792)											
CG2212850-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	205	206	0.485%	20%	----
Anions and Nutrients (QC Lot: 657793)											
FJ2202608-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 660421)											
CG2212919-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	1.25	mg/L	4.66	4.58	0.0792	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 660946)											
EO2207790-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	11.6	11.5	0.618%	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*
Anions and Nutrients (QC Lot: 660947)											
FJ2202622-003	PR3-B	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.11	4.11	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661541)											
CG2213023-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662375)											
CG2212805-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0021	<0.0020	0.00008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662384)											
CG2212920-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0223	0.0263	16.3%	20%	----
Anions and Nutrients (QC Lot: 662642)											
CG2212865-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.200	mg/L	1.67	1.57	0.102	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 657267)											
FJ2202608-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.78	2.78	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 657271)											
FJ2202608-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.16	3.01	0.14	Diff <2x LOR	----
Dissolved Metals (QC Lot: 664934)											
CG2213021-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	30.0	28.3	6.05%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	15.2	15.0	1.17%	20%	----

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: 658118)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 658631)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 661507)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 664705)						
Conductivity	----	E100	1	µS/cm	1.3	----
Physical Tests (QCLot: 664706)						
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	----
Anions and Nutrients (QCLot: 657787)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 657790)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 657791)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 657792)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 657793)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 660421)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 660946)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 660947)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 661541)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 662375)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 662375) - continued						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 662384)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 662642)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Organic / Inorganic Carbon (QCLot: 657267)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 657271)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 664934)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 658118)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	97.9	85.0	115	----
Physical Tests (QCLot: 658631)									
Colour, true	----	E329	5	CU	100 CU	101	85.0	115	----
Physical Tests (QCLot: 661507)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.2	85.0	115	----
Physical Tests (QCLot: 664704)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 664705)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	102	90.0	110	----
Physical Tests (QCLot: 664706)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	105	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 657787)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 657790)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 657791)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 657792)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 657793)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 660421)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 660946)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 660947)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 661541)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	87.8	80.0	120	----
Anions and Nutrients (QCLot: 662375)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 662375) - continued									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	94.0	80.0	120	----
Anions and Nutrients (QCLot: 662384)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	94.0	80.0	120	----
Anions and Nutrients (QCLot: 662642)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Organic / Inorganic Carbon (QCLot: 657267)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	93.7	80.0	120	----
Organic / Inorganic Carbon (QCLot: 657271)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Dissolved Metals (QCLot: 664934)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	94.8	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	92.3	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: 657787)										
CG2212854-001	Anonymous	Fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 657790)										
CG2212854-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.53 mg/L	2.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 657791)										
CG2212854-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 657792)										
CG2212854-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 657793)										
FJ2202608-002	Anonymous	Chloride	16887-00-6	E235.Cl	95.4 mg/L	100 mg/L	95.4	75.0	125	----
Anions and Nutrients (QCLot: 660421)										
CG2212919-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 660946)										
EO2207790-002	Anonymous	Silicate (as SiO2)	7631-86-9	E392	ND mg/L	10 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 660947)										
FJ2202623-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	10.4 mg/L	10 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 661541)										
CG2213023-003	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0415 mg/L	0.05 mg/L	83.0	70.0	130	----
Anions and Nutrients (QCLot: 662375)										
FJ2202622-001	MD	Phosphorus, total dissolved	7723-14-0	E375-T	0.0450 mg/L	0.05 mg/L	89.9	70.0	130	----
Anions and Nutrients (QCLot: 662384)										
CG2212920-004	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0418 mg/L	0.05 mg/L	83.6	70.0	130	----
Anions and Nutrients (QCLot: 662642)										
CG2212865-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.60 mg/L	2.5 mg/L	104	70.0	130	----
Organic / Inorganic Carbon (QCLot: 657267)										
FJ2202608-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.77 mg/L	5 mg/L	95.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 657271)										
FJ2202608-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	4.92 mg/L	5 mg/L	98.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 664934)										
CG2213021-002	Anonymous	Calcium, dissolved	7440-70-2	E421	35.0 mg/L	40 mg/L	87.5	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Sept-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES ☑ NO
	Copy of Invoice with Report YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

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 minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [F] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

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 #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- no metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sneha Sansare	Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, SI, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PCT~~	~~20-Sep-22~~	~~09:35~~	~~Water~~	4	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~PR1~~			~~Water~~	4	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			
	~~PR2~~			Water	4	R	R	R	R	R			
	~~HD-A~~			Water	4	R	R	R	R	R			
	~~HD-B~~ MID	20-Sep-22	09:35	Water	4	R	R	R	R	R			
	~~PR 2-81-A~~ PR3-A	20-Sep-22	10:35	Water	4	R	R	R	R	R			
	~~PR 2-81-B~~ PR3-B	20-Sep-22	10:35	Water	4	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2202622

Telephone : +1 250 261 5517

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
8.9c							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				9-20-22	11:40			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202642**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 09:44
PO	: 1200-25.03.02	Date Analysis Commenced	: 23-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 4	Issue Date	: 28-Sep-2022 17:00
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Kevin Baxter		Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: PD5	PD5-FB	----	----	----
					Client sampling date / time: 20-Sep-2022 14:55	20-Sep-2022 14:55	----	----	----
					FJ2202642-001	FJ2202642-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	86.9	<1.0	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	86.9	<1.0	----	----	----
colour, true	----	E329	5.0	CU	6.4	<5.0	----	----	----
conductivity	----	E100	2.0	µS/cm	185	<2.0	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	98.4	<0.60	----	----	----
pH	----	E108	0.10	pH units	8.10	5.18	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L	124	<10	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	----	----	----
Anions and Nutrients									
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L	0.036	<0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.102	<0.050	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0410	<0.0050	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0013	<0.0010	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L	0.144	<0.050	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0083	<0.0020	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.82	<0.50	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	14.6	<0.30	----	----	----
Organic / Inorganic Carbon									
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.45	<0.50	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.12	<0.50	----	----	----
Ion Balance									
anion sum	----	EC101	0.10	meq/L	2.04	<0.10	----	----	----
cation sum	----	EC101	0.10	meq/L	2.06	<0.10	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD5	PD5-FB	----	----	----
					Client sampling date / time	20-Sep-2022 14:55	20-Sep-2022 14:55	----	----	----
						FJ2202642-001	FJ2202642-002	--------	--------	--------
						Result	Result	----	----	----
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		0.488	<0.010	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		28.0	<0.050	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.92	<0.0050	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202642**	Page	: 1 of 12
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 09:44
PO	: 1200-25.03.02	Issue Date	: 28-Sep-2022 17:00
C-O-C number	: 2022-Sept-MON8/9-Day 4		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5	E298	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5-FB	E298	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5	E235.Cl	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5-FB	E235.Cl	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5	E378-U	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5-FB	E378-U	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5	E235.F	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5-FB	E235.F	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5	E235.NO3-L	20-Sep-2022	23-Sep-2022	3 days	3 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5-FB	E235.NO3-L	20-Sep-2022	23-Sep-2022	3 days	3 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD5	E235.NO2-L	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD5-FB	E235.NO2-L	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD5	E392	20-Sep-2022	----	----	----		25-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD5-FB	E392	20-Sep-2022	----	----	----		25-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5	E235.SO4	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5-FB	E235.SO4	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD5	E375-T	20-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD5-FB	E375-T	20-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD5	E318	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD5-FB	E318	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD5	E372-U	20-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD5-FB	E372-U	20-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD5	E421	20-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD5-FB	E421	20-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD5	E358-L	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD5-FB	E358-L	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD5	E355-L	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD5-FB	E355-L	20-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD5	E290	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD5-FB	E290	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD5	E329	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD5-FB	E329	20-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD5	E100	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD5-FB	E100	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / 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 PD5	E108	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PD5-FB	E108	20-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PD5	E162	20-Sep-2022	----	----	----		26-Sep-2022	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD5-FB	E162	20-Sep-2022	----	----	----		26-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD5	E160	20-Sep-2022	----	----	----		25-Sep-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD5-FB	E160	20-Sep-2022	----	----	----		25-Sep-2022	7 days	5 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	664951	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	662151	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664949	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
pH by Meter	E108	664950	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663868	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	664951	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	662151	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664949	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
pH by Meter	E108	664950	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663868	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	19	5.2	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	664951	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	662151	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664949	1	17	5.8	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663868	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	662151	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	661541	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	19	5.2	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202642**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 09:44
PO	: 1200-25.03.02	Date Analysis Commenced	: 23-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 4	Issue Date	: 28-Sep-2022 17:00
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Kevin Baxter		Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 662028)											
FJ2202642-001	PD5	colour, true	----	E329	5.0	CU	6.4	6.6	0.3	Diff <2x LOR	----
Physical Tests (QC Lot: 663868)											
CG2213023-004	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1620	1560	3.42%	20%	----
Physical Tests (QC Lot: 663878)											
CG2213018-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 664949)											
CG2212977-021	Anonymous	conductivity	----	E100	2.0	µS/cm	1290	1260	2.43%	10%	----
Physical Tests (QC Lot: 664950)											
CG2212977-021	Anonymous	pH	----	E108	0.10	pH units	8.07	8.08	0.124%	4%	----
Physical Tests (QC Lot: 664951)											
CG2212977-021	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	330	320	3.23%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	330	320	3.23%	20%	----
Anions and Nutrients (QC Lot: 661541)											
CG2213023-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661934)											
CG2212978-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.113	0.122	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661935)											
CG2212978-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	786	792	0.749%	20%	----
Anions and Nutrients (QC Lot: 661938)											
CG2212978-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	2.76	2.80	1.49%	20%	----
Anions and Nutrients (QC Lot: 661939)											
CG2212978-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	0.0057	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661940)											
FJ2202642-001	PD5	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662149)											
CG2212959-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.356	0.326	0.030	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662151)											
CG2212959-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0077	0.0074	0.0003	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*
Anions and Nutrients (QC Lot: 664739)											
CG2212884-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0360	0.0354	1.47%	20%	----
Anions and Nutrients (QC Lot: 664768)											
CG2213013-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 665683)											
CG2213023-007	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 662389)											
FJ2202642-001	PD5	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.45	3.58	0.14	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 662390)											
FJ2202642-001	PD5	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.12	3.59	0.46	Diff <2x LOR	----
Dissolved Metals (QC Lot: 668260)											
FJ2202642-001	PD5	calcium, dissolved	7440-70-2	E421	0.050	mg/L	28.0	27.7	0.879%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.92	6.72	2.91%	20%	----

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: 662028)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 663868)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 663878)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 664949)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 664951)						
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	----
Anions and Nutrients (QCLot: 661541)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 661934)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 661935)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 661938)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 661939)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 661940)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 662149)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 662151)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 664739)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 664768)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 665683)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 662389)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 662390)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 668260)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 662028)									
colour, true	----	E329	5	CU	100 CU	100	85.0	115	----
Physical Tests (QCLot: 663868)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.7	85.0	115	----
Physical Tests (QCLot: 663878)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.7	85.0	115	----
Physical Tests (QCLot: 664949)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.4	90.0	110	----
Physical Tests (QCLot: 664950)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 664951)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	92.2	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 661541)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	87.8	80.0	120	----
Anions and Nutrients (QCLot: 661934)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 661935)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 661938)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 661939)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.4	90.0	110	----
Anions and Nutrients (QCLot: 661940)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 662149)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 662151)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.3	85.0	115	----
Anions and Nutrients (QCLot: 664739)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 664768)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	97.7	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 665683)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	94.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 662389)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.0	80.0	120	----
Organic / Inorganic Carbon (QCLot: 662390)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	93.2	80.0	120	----
Dissolved Metals (QCLot: 668260)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.9	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: 661541)										
CG2213023-003	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0415 mg/L	0.05 mg/L	83.0	70.0	130	----
Anions and Nutrients (QCLot: 661934)										
CG2213003-013	Anonymous	fluoride	16984-48-8	E235.F	1.05 mg/L	1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 661935)										
CG2213003-013	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 661938)										
CG2213003-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.57 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 661939)										
CG2213003-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.518 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 661940)										
FJ2202642-002	PD5-FB	chloride	16887-00-6	E235.Cl	97.9 mg/L	100 mg/L	97.9	75.0	125	----
Anions and Nutrients (QCLot: 662149)										
CG2212959-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.64 mg/L	2.5 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 662151)										
CG2212959-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 664739)										
CG2212884-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0437 mg/L	0.05 mg/L	87.5	70.0	130	----
Anions and Nutrients (QCLot: 664768)										
CG2213014-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	10.2 mg/L	10 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 665683)										
CG2213023-008	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0450 mg/L	0.05 mg/L	90.1	70.0	130	----
Organic / Inorganic Carbon (QCLot: 662389)										
FJ2202642-001	PD5	carbon, dissolved organic [DOC]	----	E358-L	5.18 mg/L	5 mg/L	104	70.0	130	----
Organic / Inorganic Carbon (QCLot: 662390)										
FJ2202642-001	PD5	carbon, total organic [TOC]	----	E355-L	5.32 mg/L	5 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 668260)										
FJ2202642-002	PD5-FB	calcium, dissolved	7440-70-2	E421	40.6 mg/L	40 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	10.5 mg/L	10 mg/L	105	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Sept-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES ☑ NO
	Copy of Invoice with Report YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

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

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

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	Alk., Ec, pH, TDS, TSS, Anions, SI, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PD5	20 SEP 22	14:55	Water	4	R	R	R	R	R			
	PD5-FB	20 SEP 22	14:55	Water	4	R	R	R	R	R			
	~~MB~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			

Fort St. John
Work Order Reference
FJ2202642

Telephone : +1 250 261 5617

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

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
10.1							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Sept 20, 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
8	Sept 20/22	1753

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202647**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 11:40
PO	: 1200-25.03.02	Date Analysis Commenced	: 23-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 2	Issue Date	: 03-Nov-2022 15:01
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Dwayne Bennett	Technical Specialist	Inorganics, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Workorder Comments

Amendment (3/11/2022): This report has been amended and re-released to allow the reporting of additional analytical data. Added Ion Balance, Cation/Anion sum to samples 001 and 002 not previously reported.

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1	PR1	PR2	HD-A	HD-B
					Client sampling date / time	21-Sep-2022 07:20	21-Sep-2022 08:00	21-Sep-2022 09:25	21-Sep-2022 10:00	21-Sep-2022 10:00
						FJ2202647-001	FJ2202647-002	FJ2202647-003	FJ2202647-004	FJ2202647-005
						Result	Result	Result	Result	Result
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		81.6	80.8	81.6	181	179
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	15.6	15.8
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	<1.0	7.8	7.9
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		81.6	80.8	81.6	197	195
colour, true	----	E329	5.0	CU		6.8	6.3	6.4	<5.0	<5.0
conductivity	----	E100	2.0	µS/cm		173	169	170	427	424
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		89.4	89.0	89.8	243	240
pH	----	E108	0.10	pH units		7.99	8.03	8.05	8.48	8.48
solids, total dissolved [TDS]	----	E162	10	mg/L		121	112	118	268	270
solids, total suspended [TSS]	----	E160	3.0	mg/L		<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0097	0.0087	<0.0050	<0.0050	<0.0050
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
fluoride	16984-48-8	E235.F	0.020	mg/L		0.034	0.032	0.032	0.093	0.095
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.094	0.189	0.104	0.102	0.080
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0641	0.0607	0.0583	<0.0050	<0.0050
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0024	0.0021	0.0015	<0.0010	<0.0010
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.160	0.252	0.164	0.102	0.080
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		0.0013	0.0013	0.0010	0.0011	<0.0010
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0041	0.0046	0.0053	0.0104	0.0094
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.34	4.35	4.16	3.46	3.44
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		12.2	12.1	12.3	52.5	54.0
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		3.12	3.02	3.20	3.44	2.79
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.90	3.09	2.73	3.43	2.99
Ion Balance										
anion sum	----	EC101	0.10	meq/L		1.89	1.87	1.89	5.03	5.03

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1	PR1	PR2	HD-A	HD-B
					Client sampling date / time	21-Sep-2022 07:20	21-Sep-2022 08:00	21-Sep-2022 09:25	21-Sep-2022 10:00	21-Sep-2022 10:00
						FJ2202647-001	FJ2202647-002	FJ2202647-003	FJ2202647-004	FJ2202647-005
						Result	Result	Result	Result	Result
Ion Balance										
cation sum	----	EC101	0.10	meq/L		1.84	1.84	1.85	5.00	4.94
ion balance (APHA)	----	EC101	0.01	%		-1.34	-0.81	----	----	----
ion balance (APHA)	----	EC101	0.010	%		----	----	1.07	0.299	0.903
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		25.7	25.6	25.8	65.0	64.5
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.12	6.08	6.17	19.5	19.1
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202647**	Page	: 1 of 20
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 11:40
PO	: 1200-25.03.02	Issue Date	: 03-Nov-2022 15:02
C-O-C number	: 2022-Sept-MON8/9-Day 2		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD-A	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD-B	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PC1	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR1	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2	E298	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD-A	E235.Cl	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD-B	E235.Cl	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Chloride in Water by IC										
HDPE PC1	E235.Cl	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR1	E235.Cl	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2	E235.Cl	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD-A	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD-B	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2	E378-U	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD-A	E235.F	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD-B	E235.F	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1	E235.F	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1	E235.F	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2	E235.F	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD-A	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD-B	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR2	E235.NO3-L	21-Sep-2022	23-Sep-2022	3 days	2 days	✓	23-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD-A	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD-B	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2	E235.NO2-L	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD-A	E392	21-Sep-2022	----	----	----		25-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD-B	E392	21-Sep-2022	----	----	----		25-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PC1	E392	21-Sep-2022	----	----	----		25-Sep-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PR1	E392	21-Sep-2022	----	----	----		25-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR2	E392	21-Sep-2022	----	----	----		25-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD-A	E235.SO4	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD-B	E235.SO4	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1	E235.SO4	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1	E235.SO4	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2	E235.SO4	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD-A	E375-T	21-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD-B	E375-T	21-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1	E375-T	21-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1	E375-T	21-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2	E375-T	21-Sep-2022	25-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD-A	E318	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) HD-B	E318	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PC1	E318	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR1	E318	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PR2	E318	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD-A	E372-U	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD-B	E372-U	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1	E372-U	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1	E372-U	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2	E372-U	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD-A	E421	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD-B	E421	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PC1	E421	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR1	E421	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR2	E421	21-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	6 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD-A	E358-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD-B	E358-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PC1	E358-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1	E358-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2	E358-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD-A	E355-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD-B	E355-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1	E355-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1	E355-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2	E355-L	21-Sep-2022	23-Sep-2022	----	----		24-Sep-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD-A	E290	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE HD-B	E290	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1	E290	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1	E290	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2	E290	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD-A	E329	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD-B	E329	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1	E329	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓

Matrix: **Water**

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

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PR1	E329	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR2	E329	21-Sep-2022	23-Sep-2022	----	----		23-Sep-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE HD-A	E100	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE HD-B	E100	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PC1	E100	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1	E100	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PR2	E100	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE HD-A	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE HD-B	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM

Matrix: **Water**

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

Analyte Group / 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 PC1	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2	E108	21-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD-A	E162	21-Sep-2022	----	----	----		26-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE HD-B	E162	21-Sep-2022	----	----	----		26-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PC1	E162	21-Sep-2022	----	----	----		26-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR1	E162	21-Sep-2022	----	----	----		26-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR2	E162	21-Sep-2022	----	----	----		26-Sep-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD-A	E160	21-Sep-2022	----	----	----		25-Sep-2022	7 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 : TSS by Gravimetry										
HDPE HD-B	E160	21-Sep-2022	----	----	----		25-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PC1	E160	21-Sep-2022	----	----	----		25-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1	E160	21-Sep-2022	----	----	----		25-Sep-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2	E160	21-Sep-2022	----	----	----		25-Sep-2022	7 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	664968	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	662151	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664967	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662043	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
pH by Meter	E108	664966	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663869	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	2	37	5.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	664968	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	662151	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664967	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662043	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
pH by Meter	E108	664966	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663869	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							
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	2	37	5.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	664968	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	662151	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	662028	1	18	5.5	5.0	✓
Conductivity in Water	E100	664967	1	16	6.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662043	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	663869	1	6	16.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	2	37	5.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	1	18	5.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	663878	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	662151	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	661940	1	7	14.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668260	1	12	8.3	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	662389	1	16	6.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	662043	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	661934	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	661938	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	661939	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	664768	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	661935	1	15	6.6	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	664739	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	662149	2	37	5.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	662390	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*
Matrix Spikes (MS) - Continued							
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665683	1	20	5.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Vancouver - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202647**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 21-Sep-2022 11:40
PO	: 1200-25.03.02	Date Analysis Commenced	: 23-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 2	Issue Date	: 03-Nov-2022 15:02
Sampler	: Pat Beaupre 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Dwayne Bennett	Technical Specialist	Calgary Inorganics, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 662028)											
FJ2202642-001	Anonymous	colour, true	----	E329	5.0	CU	6.4	6.6	0.3	Diff <2x LOR	----
Physical Tests (QC Lot: 663869)											
FJ2202646-004	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	277	277	0.00%	20%	----
Physical Tests (QC Lot: 663878)											
CG2213018-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 664966)											
FJ2202646-003	Anonymous	pH	----	E108	0.10	pH units	8.45	8.48	0.354%	4%	----
Physical Tests (QC Lot: 664967)											
FJ2202646-004	Anonymous	conductivity	----	E100	2.0	µS/cm	422	422	0.00%	10%	----
Physical Tests (QC Lot: 664968)											
FJ2202647-001	PC1	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	81.6	82.0	0.489%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	81.6	82.0	0.489%	20%	----
Anions and Nutrients (QC Lot: 661934)											
CG2212978-001	Anonymous	fluoride	16984-48-8	E235.F	0.100	mg/L	0.113	0.122	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661935)											
CG2212978-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	786	792	0.749%	20%	----
Anions and Nutrients (QC Lot: 661938)											
CG2212978-001	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	2.76	2.80	1.49%	20%	----
Anions and Nutrients (QC Lot: 661939)											
CG2212978-001	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	0.0057	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 661940)											
FJ2202642-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662043)											
CG2213003-025	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662149)											
CG2212959-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.356	0.326	0.030	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*
Anions and Nutrients (QC Lot: 662150)											
FJ2202647-003	PR2	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.104	0.116	0.011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662151)											
CG2212959-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0077	0.0074	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 662152)											
FJ2202647-003	PR2	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664739)											
CG2212884-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0360	0.0354	1.47%	20%	----
Anions and Nutrients (QC Lot: 664768)											
CG2213013-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 665683)											
CG2213023-007	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 662389)											
FJ2202642-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.45	3.58	0.14	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 662390)											
FJ2202642-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.12	3.59	0.46	Diff <2x LOR	----
Dissolved Metals (QC Lot: 668260)											
FJ2202642-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	28.0	27.7	0.879%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.92	6.72	2.91%	20%	----

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: 662028)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 663869)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 663878)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 664967)						
conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 664968)						
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	----
Anions and Nutrients (QCLot: 661934)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 661935)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 661938)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 661939)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 661940)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 662043)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 662149)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 662150)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 662151)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 662152)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 662152) - continued						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 664739)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 664768)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 665683)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 662389)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 662390)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 668260)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 662028)									
colour, true	----	E329	5	CU	100 CU	100	85.0	115	----
Physical Tests (QCLot: 663869)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.3	85.0	115	----
Physical Tests (QCLot: 663878)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.7	85.0	115	----
Physical Tests (QCLot: 664966)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 664967)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.3	90.0	110	----
Physical Tests (QCLot: 664968)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	90.7	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 661934)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 661935)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 661938)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 661939)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.4	90.0	110	----
Anions and Nutrients (QCLot: 661940)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 662043)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	91.9	80.0	120	----
Anions and Nutrients (QCLot: 662149)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 662150)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 662151)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.3	85.0	115	----
Anions and Nutrients (QCLot: 662152)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 662152) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.2	85.0	115	----
Anions and Nutrients (QCLot: 664739)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 664768)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	97.7	85.0	115	----
Anions and Nutrients (QCLot: 665683)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	94.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 662389)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	94.0	80.0	120	----
Organic / Inorganic Carbon (QCLot: 662390)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	93.2	80.0	120	----
Dissolved Metals (QCLot: 668260)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	96.9	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: 661934)										
CG2213003-013	Anonymous	fluoride	16984-48-8	E235.F	1.05 mg/L	1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 661935)										
CG2213003-013	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 661938)										
CG2213003-013	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.57 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 661939)										
CG2213003-013	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.518 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 661940)										
FJ2202642-002	Anonymous	chloride	16887-00-6	E235.Cl	97.9 mg/L	100 mg/L	97.9	75.0	125	----
Anions and Nutrients (QCLot: 662043)										
CG2213003-026	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0408 mg/L	0.05 mg/L	81.7	70.0	130	----
Anions and Nutrients (QCLot: 662149)										
CG2212959-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.64 mg/L	2.5 mg/L	106	70.0	130	----
Anions and Nutrients (QCLot: 662150)										
FJ2202647-004	HD-A	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 662151)										
CG2212959-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 662152)										
FJ2202647-004	HD-A	ammonia, total (as N)	7664-41-7	E298	0.103 mg/L	0.1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 664739)										
CG2212884-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0437 mg/L	0.05 mg/L	87.5	70.0	130	----
Anions and Nutrients (QCLot: 664768)										
CG2213014-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	10.2 mg/L	10 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 665683)										
CG2213023-008	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0450 mg/L	0.05 mg/L	90.1	70.0	130	----
Organic / Inorganic Carbon (QCLot: 662389)										
FJ2202642-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.18 mg/L	5 mg/L	104	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
Organic / Inorganic Carbon (QCLot: 662390)										
FJ2202642-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.32 mg/L	5 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 668260)										
FJ2202642-002	Anonymous	calcium, dissolved	7440-70-2	E421	40.6 mg/L	40 mg/L	102	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	10.5 mg/L	10 mg/L	105	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Sept-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES NO
	Copy of Invoice with Report YES NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: lhull@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: EMAIL MAIL FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

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 minimum
- 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

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

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): Fort St. John Work Order Reference FJ2202647

LS Contact: Sneha Sansare Sampler: Pat Beaupre

Telephone : +1 250 261 5617

Analysis Request

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

ALS Sample # (ALS use only)	Samp (This	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, SI, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	Hardness (F)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PC1~~ PC1	21 SEP 22	07:20	~~Water~~	4	R	R	R	R	R			
	~~PR1~~ PR1	21 SEP 22	08:00	~~Water~~	4	R	R	R	R	R			
	PR2	21 SEP 22	09:25	Water	4	R	R	R	R	R			
	HD-A	21 SEP 22	10:00	Water	4	R	R	R	R	R			
	HD-B	21 SEP 22	10:00	Water	4	R	R	R	R	R			
	~~PR-2.01-A~~			~~Water~~	4	R	R	R	R	R			
	~~PR-2.01-B~~			~~Water~~	4	R	R	R	R	R			

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

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption/ use? YES NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
4.1							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Sept 21, 2022	Time:	Received by:	Date: Sept 21/22	Time:	Received by:	Date:	Time:

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202682**	Page	: 1 of 4
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Sep-2022 12:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Sep-2022
C-O-C number	: 2022-SEPT-MON8/9-DAY4	Issue Date	: 11-Oct-2022 17:20
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Elke Tabora		Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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 Unit
%	percent
µS/cm	Microsiemens per centimetre
CU	colour units (1 CU = 1 mg/L Pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Qualifiers

Qualifier	*Description*
DTC	*Dissolved concentration exceeds total. Results were confirmed by re-analysis.*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD1	PINE	----	----	----
					Client sampling date / time	22-Sep-2022 09:55	22-Sep-2022 10:35	----	----	----
						FJ2202682-001	FJ2202682-002	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L		84.4	145	----	----	----
alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L		<1.0	1.6	----	----	----
alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	----	----	----
alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L		<1.0	<1.0	----	----	----
alkalinity, total (as CaCO3)	----	E290	1.0	mg/L		84.4	147	----	----	----
colour, true	----	E329	5.0	CU		6.6	<5.0	----	----	----
conductivity	----	E100	2.0	µS/cm		179	310	----	----	----
hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L		92.6	166	----	----	----
pH	----	E108	0.10	pH units		8.02	8.28	----	----	----
solids, total dissolved [TDS]	----	E162	10	mg/L		136	208	----	----	----
solids, total suspended [TSS]	----	E160	3.0	mg/L		4.5	<3.0	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		0.0073	<0.0050	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	1.46	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		0.035	0.065	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L		0.114	<0.050	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		0.0501	0.0054	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		0.0019	<0.0010	----	----	----
nitrogen, total	7727-37-9	EC368	0.050	mg/L		0.166	<0.050	----	----	----
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L		<0.0010	<0.0010	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0060	0.0037	----	----	----
phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L		<0.0020	<0.0020	----	----	----
silicate (as SiO2)	7631-86-9	E392	0.50	mg/L		4.03	2.44	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		13.7	26.2	----	----	----
Organic / Inorganic Carbon										
carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L		2.22	0.88 DTC, RRV	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		2.52	0.57 DTC, RRV	----	----	----
Ion Balance										
anion sum	----	EC101	0.10	meq/L		1.98	3.53	----	----	----
cation sum	----	EC101	0.10	meq/L		1.91	3.49	----	----	----

Analytical Results

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

					Client sample ID	PD1	PINE	----	----	----
					Client sampling date / time	22-Sep-2022 09:55	22-Sep-2022 10:35	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2202682-001	FJ2202682-002	--------	--------	--------
						Result	Result	----	----	----
Ion Balance										
ion balance (APHA)	----	EC101	0.010	%		1.80	0.570	----	----	----
Dissolved Metals										
calcium, dissolved	7440-70-2	E421	0.050	mg/L		27.3	46.6	----	----	----
magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		5.93	12.0	----	----	----
dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	----	----	----

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202682**	Page	: 1 of 12
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Sep-2022 12:50
PO	: 1200-25.03.02	Issue Date	: 11-Oct-2022 17:20
C-O-C number	: 2022-SEPT-MON8/9-DAY4		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD1	E298	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) PINE	E298	22-Sep-2022	25-Sep-2022	3 days	3 days	✓	25-Sep-2022	28 days	0 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD1	E235.Cl	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PINE	E235.Cl	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD1	E378-U	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PINE	E378-U	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD1	E235.F	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PINE	E235.F	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD1	E235.NO3-L	22-Sep-2022	25-Sep-2022	3 days	3 days	✓	25-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PINE	E235.NO3-L	22-Sep-2022	25-Sep-2022	3 days	3 days	✓	25-Sep-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PD1	E235.NO2-L	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PINE	E235.NO2-L	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PD1	E392	22-Sep-2022	----	----	----		27-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PINE	E392	22-Sep-2022	----	----	----		27-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD1	E235.SO4	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PINE	E235.SO4	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD1	E375-T	22-Sep-2022	27-Sep-2022	----	----		28-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PINE	E375-T	22-Sep-2022	27-Sep-2022	----	----		28-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) PD1	E318	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (lab preserved) PINE	E318	22-Sep-2022	26-Sep-2022	3 days	4 days	× EHT	26-Sep-2022	28 days	0 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD1	E372-U	22-Sep-2022	27-Sep-2022	----	----		28-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved) PINE	E372-U	22-Sep-2022	25-Sep-2022	3 days	3 days	✓	26-Sep-2022	28 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD1	E421	22-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PINE	E421	22-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	180 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD1	E358-L	22-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	5 days	✓

Matrix: **Water**

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

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PINE	E358-L	22-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD1	E355-L	22-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (lab preserved) PINE	E355-L	22-Sep-2022	26-Sep-2022	3 days	4 days	× EHT	27-Sep-2022	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD1	E290	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PINE	E290	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD1	E329	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PINE	E329	22-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE PD1	E100	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PINE	E100	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	4 days	✓

Matrix: **Water**

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

Analyte Group / 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 PD1	E108	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PINE	E108	22-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PD1	E162	22-Sep-2022	----	----	----		27-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PINE	E162	22-Sep-2022	----	----	----		27-Sep-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD1	E160	22-Sep-2022	----	----	----		27-Sep-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PINE	E160	22-Sep-2022	----	----	----		27-Sep-2022	7 days	5 days	✓

Legend & Qualifier Definitions

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

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: **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	665949	2	31	6.4	5.0	✓
Ammonia by Fluorescence	E298	664990	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	664700	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	665951	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668684	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664699	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664696	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664698	1	8	12.5	5.0	✓
pH by Meter	E108	665950	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664697	1	2	50.0	5.0	✓
TDS by Gravimetry	E162	668398	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	668131	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	664944	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665136	2	31	6.4	5.0	✓
TSS by Gravimetry	E160	665118	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	665949	2	31	6.4	5.0	✓
Ammonia by Fluorescence	E298	664990	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	664700	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	665951	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668684	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664699	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664696	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664698	1	8	12.5	5.0	✓
pH by Meter	E108	665950	1	14	7.1	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664697	1	2	50.0	5.0	✓
TDS by Gravimetry	E162	668398	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	668131	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	664944	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665136	2	31	6.4	5.0	✓
TSS by Gravimetry	E160	665118	1	14	7.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	665949	2	31	6.4	5.0	✓
Ammonia by Fluorescence	E298	664990	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	664700	1	8	12.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	665951	1	10	10.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668684	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664699	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664696	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664698	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664697	1	2	50.0	5.0	✓
TDS by Gravimetry	E162	668398	1	16	6.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	668131	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	664944	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665136	2	31	6.4	5.0	✓
TSS by Gravimetry	E160	665118	1	14	7.1	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	664990	2	35	5.7	5.0	✓
Chloride in Water by IC	E235.Cl	664700	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	668684	1	15	6.6	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664699	1	2	50.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664696	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664698	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664697	1	2	50.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	668131	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	664944	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	665136	2	31	6.4	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 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Total Nitrogen (calculation)	EC368 Calgary - Environmental	Water	BC MOE LABORATORY MANUAL (2005)	Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

QUALITY CONTROL REPORT

Work Order	: **FJ2202682**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sneha Sansare
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-No Metals	Date Samples Received	: 22-Sep-2022 12:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Sep-2022
C-O-C number	: 2022-SEPT-MON8/9-DAY4	Issue Date	: 11-Oct-2022 17:20
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 664903)											
FJ2202682-001	PD1	colour, true	----	E329	5.0	CU	6.6	7.1	0.5	Diff <2x LOR	----
Physical Tests (QC Lot: 665118)											
CG2213084-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	15.9	17.5	1.6	Diff <2x LOR	----
Physical Tests (QC Lot: 665949)											
CG2213046-001	Anonymous	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	57.2	57.3	0.175%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	14.6	15.0	2.70%	20%	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	7.3	7.5	0.2	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	71.8	72.3	0.694%	20%	----
Physical Tests (QC Lot: 665950)											
FJ2202681-001	Anonymous	pH	----	E108	0.10	pH units	8.23	8.28	0.606%	4%	----
Physical Tests (QC Lot: 665951)											
FJ2202681-001	Anonymous	conductivity	----	E100	2.0	µS/cm	311	310	0.322%	10%	----
Physical Tests (QC Lot: 665952)											
FJ2202682-002	PINE	alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	145	151	3.86%	20%	----
		alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	1.6	3.2	1.6	Diff <2x LOR	----
		alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	1.6	0.6	Diff <2x LOR	----
		alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	147	154	4.86%	20%	----
Physical Tests (QC Lot: 668398)											
CG2213212-002	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	1770	1750	1.11%	20%	----
Anions and Nutrients (QC Lot: 664696)											
FJ2202682-001	PD1	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0501	0.0574	13.6%	20%	----
Anions and Nutrients (QC Lot: 664697)											
FJ2202682-001	PD1	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	13.7	13.8	0.394%	20%	----
Anions and Nutrients (QC Lot: 664698)											
FJ2202682-001	PD1	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0019	0.0016	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664699)											
FJ2202682-001	PD1	fluoride	16984-48-8	E235.F	0.020	mg/L	0.035	0.034	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664700)											

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*
Anions and Nutrients (QC Lot: 664700) - continued											
FJ2202682-001	PD1	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664873)											
CG2213122-001	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664944)											
FJ2202682-001	PD1	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.114	0.084	0.030	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664990)											
FJ2202682-002	PINE	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 665065)											
CG2213123-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.125	mg/L	3.66	3.66	0.0628%	20%	----
Anions and Nutrients (QC Lot: 665136)											
CG2213042-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0054	0.0051	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 667775)											
FJ2202680-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 668131)											
CG2212959-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0134	0.0144	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 668736)											
CG2213135-001	Anonymous	silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	1.77	1.76	0.007	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 666176)											
CG2213141-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 666177)											
CG2213141-001	Anonymous	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 668684)											
FJ2202679-001	Anonymous	calcium, dissolved	7440-70-2	E421	0.050	mg/L	64.2	64.1	0.0763%	20%	----
		magnesium, dissolved	7439-95-4	E421	0.100	mg/L	13.8	13.6	1.58%	20%	----

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: 664903)						
colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 665118)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 665949)						
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: 665951)						
conductivity	----	E100	1	µS/cm	1.0	----
Physical Tests (QCLot: 665952)						
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: 668398)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 664696)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 664697)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 664698)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 664699)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 664700)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 664873)						
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 664944)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 664990)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 665065)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 665136)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 667775)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 668131)						
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 668736)						
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 666176)						
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 666177)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 668684)						
calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 664903)									
colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 665118)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	99.6	85.0	115	----
Physical Tests (QCLot: 665949)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	108	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	105	85.0	115	----
Physical Tests (QCLot: 665950)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 665951)									
conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 665952)									
alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	102	75.0	125	----
alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 668398)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	97.3	85.0	115	----
Anions and Nutrients (QCLot: 664696)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 664697)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 664698)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 664699)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 664700)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 664873)									
phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	93.7	80.0	120	----
Anions and Nutrients (QCLot: 664944)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 664990)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.8	85.0	115	----
Anions and Nutrients (QCLot: 665065)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 665065) - continued									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.8	85.0	115	----
Anions and Nutrients (QCLot: 665136)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	95.2	80.0	120	----
Anions and Nutrients (QCLot: 667775)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	94.3	80.0	120	----
Anions and Nutrients (QCLot: 668131)									
phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	91.4	80.0	120	----
Anions and Nutrients (QCLot: 668736)									
silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----
Organic / Inorganic Carbon (QCLot: 666176)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 666177)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	96.0	80.0	120	----
Dissolved Metals (QCLot: 668684)									
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.0	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	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: 664696)										
FJ2202682-002	PINE	nitrate (as N)	14797-55-8	E235.NO3-L	2.49 mg/L	2.5 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 664697)										
FJ2202682-002	PINE	sulfate (as SO4)	14808-79-8	E235.SO4	98.8 mg/L	100 mg/L	98.8	75.0	125	----
Anions and Nutrients (QCLot: 664698)										
FJ2202682-002	PINE	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: 664699)										
FJ2202682-002	PINE	fluoride	16984-48-8	E235.F	0.996 mg/L	1 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 664700)										
FJ2202682-002	PINE	chloride	16887-00-6	E235.Cl	99.1 mg/L	100 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 664873)										
CG2213122-002	Anonymous	phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0445 mg/L	0.05 mg/L	89.1	70.0	130	----
Anions and Nutrients (QCLot: 664944)										
FJ2202682-002	PINE	Kjeldahl nitrogen, total [TKN]	----	E318	2.62 mg/L	2.5 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 664990)										
VA22C2848-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0796 mg/L	0.1 mg/L	79.6	75.0	125	----
Anions and Nutrients (QCLot: 665065)										
CG2213123-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 665136)										
CG2213122-001	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0480 mg/L	0.05 mg/L	96.1	70.0	130	----
Anions and Nutrients (QCLot: 667775)										
FJ2202680-002	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0474 mg/L	0.05 mg/L	94.8	70.0	130	----
Anions and Nutrients (QCLot: 668131)										
CG2212959-002	Anonymous	phosphorus, total dissolved	7723-14-0	E375-T	0.0508 mg/L	0.05 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 668736)										
CG2213135-002	Anonymous	silicate (as SiO2)	7631-86-9	E392	11.2 mg/L	10 mg/L	112	75.0	125	----
Organic / Inorganic Carbon (QCLot: 666176)										
CG2213141-001	Anonymous	carbon, dissolved organic [DOC]	----	E358-L	5.28 mg/L	5 mg/L	106	70.0	130	----
Organic / Inorganic Carbon (QCLot: 666177)										

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
Organic / Inorganic Carbon (QCLot: 666177) - continued										
CG2213141-001	Anonymous	carbon, total organic [TOC]	----	E355-L	5.28 mg/L	5 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 668684)										
FJ2202680-001	Anonymous	calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-Sept-MON8/9- Day 4

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To YES ☐ NO
	Copy of Invoice with Report YES ☐ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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 lhull@ecofishresearch.com
Email 2 tkasubuchi@ecofishresearch.com
Email 3 waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #: VA22-ECOF100-004
Job #: Surface water MON8/9- no metals
PO / AFE: 1200-25.03.02
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Sneha Sansare Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Si, diss ortho P, colour, pH (F/P)	DOC, Total dissolved P (F)	Hardness (P)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL (P)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD5~~ PD1	22SEP22	09:55	Water	4	R	R	R	R	R			
	~~PD5-FB~~ PINE	22SEP22	10:35	Water	4	R	R	R	R	R			
	~~MB~~			~~Water~~	~~4~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			

Fort St. John
Work Order Reference
FJ2202682

Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:
gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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			
6.3							

SHIPMENT RELEASE (client use)

Released by: Date: 22 SEP 22 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: 9-22-22 Time: 12:50

FINAL SHIPMENT RECEPTION (ALS use only)

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**.

AUG 2020 FRONT

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202687**	Page	: 1 of 4
Amendment	: **1**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: ----	Date Samples Received	: 23-Sep-2022 12:19
PO	: ----	Date Analysis Commenced	: 25-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 1	Issue Date	: 10-May-2023 15:54
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Elke Tabora		Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Sean Zhang	Account Manager	Administration, Calgary, Alberta
Summie Lo	Lab Assistant	Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
L	litres
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Amendment (10/5/2023): This report has been amended and re-released to allow the reporting of additional analytical data. Added ug/L calculation for Chlorophyll-a.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
					Client sampling date / time: 23-Sep-2022 07:20	23-Sep-2022 07:45	23-Sep-2022 09:30	23-Sep-2022 09:50	23-Sep-2022
					FJ2202687-001	FJ2202687-002	FJ2202687-003	FJ2202687-004	FJ2202687-005
					Result	Result	Result	Result	Result
Sample Preparation									
Volume filtered	----	EF870B	0.001	L	0.200	0.200	0.200	0.200	0.200
Physical Tests									
Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	76.0	78.8	81.4	79.1	<1.0
Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	76.0	78.8	81.4	79.1	<1.0
Colour, true	----	E329	5.0	CU	7.3	7.5	6.7	7.1	<5.0
Conductivity	----	E100	2.0	µS/cm	163	161	164	166	<2.0
Hardness (as CaCO3), dissolved	----	EC100	0.60	mg/L	91.8	89.6	90.0	91.9	<0.60
pH	----	E108	0.10	pH units	7.90	7.89	7.89	7.90	5.33
Solids, total dissolved [TDS]	----	E162	10	mg/L	92	84	92	93	<10
Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0156	0.0137	0.0124	0.0109	<0.0050
Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.031	0.032	0.033	0.033	<0.020
Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.111	0.052	0.070	0.090	<0.050
Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0487	0.0527	0.0566	0.0574	<0.0050
Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0038	0.0038	0.0029	0.0029	<0.0010
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0031	0.0080	0.0037	0.0040	<0.0020
Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.24	4.24	4.34	4.44	<0.50
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	11.6	11.6	12.1	12.4	<0.30
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.41	2.67	2.48	2.57	----
Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.56	2.58	2.05	2.76	<0.50
Ion Balance									

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
					Client sampling date / time	23-Sep-2022 07:20	23-Sep-2022 07:45	23-Sep-2022 09:30	23-Sep-2022 09:50	23-Sep-2022
						FJ2202687-001	FJ2202687-002	FJ2202687-003	FJ2202687-004	FJ2202687-005
						Result	Result	Result	Result	Result
Ion Balance										
Anion sum	----	EC101	0.10	meq/L		1.76	1.82	1.88	1.84	<0.10
Cation sum	----	EC101	0.10	meq/L		1.89	1.85	1.86	1.90	<0.10
Ion balance (APHA)	----	EC101	0.010	%		3.56	0.817	0.535	1.60	<0.010
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421	0.050	mg/L		26.8	25.9	26.0	26.7	<0.050
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L		6.04	6.05	6.08	6.12	<0.0050
Dissolved metals filtration location	----	EP421	-	-		Laboratory	Laboratory	Laboratory	Laboratory	Laboratory
Plant Pigments										
Chlorophyll a	479-61-8	EC870B	0.010	µg/L		1.96	2.40	2.00	1.89	<0.010
Chlorophyll a	479-61-8	E870B	0.0020	µg/sample		0.393	0.480	0.401	0.378	<0.0020

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202687**	Page	: 1 of 23
Amendment	: 1		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: 250 334 3042	Telephone	: +1 250 261 5517
Project	: ----	Date Samples Received	: 23-Sep-2022 12:19
PO	: ----	Issue Date	: 10-May-2023 15:55
C-O-C number	: 2022-Sept-MON8/9-Day 1		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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 Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Plant Pigments	QC-673507-001	----	Chlorophyll a	479-61-8	E870B	0.0128 B µg/sample	0.002 µg/sample	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-DEEP	E298	23-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-SHALLOW	E298	23-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TRAVEL BLANK	E298	23-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-DEEP	E298	23-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-SHALLOW	E298	23-Sep-2022	27-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-DEEP	E235.Cl	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-SHALLOW	E235.Cl	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
HDPE TRAVEL BLANK	E235.Cl	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-DEEP	E235.Cl	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-SHALLOW	E235.Cl	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-DEEP	E378-U	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-SHALLOW	E378-U	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE TRAVEL BLANK	E378-U	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-DEEP	E378-U	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-SHALLOW	E378-U	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-DEEP	E235.F	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-SHALLOW	E235.F	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE TRAVEL BLANK	E235.F	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-DEEP	E235.F	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-SHALLOW	E235.F	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO3-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO3-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE TRAVEL BLANK	E235.NO3-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO3-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO3-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO2-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO2-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE TRAVEL BLANK	E235.NO2-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO2-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO2-L	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-DEEP	E392	23-Sep-2022	----	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-SHALLOW	E392	23-Sep-2022	----	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE TRAVEL BLANK	E392	23-Sep-2022	----	----	----		27-Sep-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE W1-DEEP	E392	23-Sep-2022	----	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-SHALLOW	E392	23-Sep-2022	----	----	----		27-Sep-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-DEEP	E235.SO4	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-SHALLOW	E235.SO4	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TRAVEL BLANK	E235.SO4	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-DEEP	E235.SO4	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-SHALLOW	E235.SO4	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-DEEP	E375-T	23-Sep-2022	28-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-SHALLOW	E375-T	23-Sep-2022	28-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-DEEP	E375-T	23-Sep-2022	28-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-SHALLOW	E375-T	23-Sep-2022	28-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) TRAVEL BLANK	E375-T	23-Sep-2022	28-Sep-2022	----	----		01-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-DEEP	E318	23-Sep-2022	28-Sep-2022	----	----		28-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) D1-SHALLOW	E318	23-Sep-2022	28-Sep-2022	----	----		28-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) TRAVEL BLANK	E318	23-Sep-2022	28-Sep-2022	----	----		28-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-DEEP	E318	23-Sep-2022	28-Sep-2022	----	----		28-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) W1-SHALLOW	E318	23-Sep-2022	28-Sep-2022	----	----		28-Sep-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-DEEP	E372-U	23-Sep-2022	27-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
D1-SHALLOW	E372-U	23-Sep-2022	27-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
TRAVEL BLANK	E372-U	23-Sep-2022	27-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-DEEP	E372-U	23-Sep-2022	27-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
W1-SHALLOW	E372-U	23-Sep-2022	27-Sep-2022	----	----		29-Sep-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-DEEP	E421	23-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
D1-SHALLOW	E421	23-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
TRAVEL BLANK	E421	23-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-DEEP	E421	23-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-SHALLOW	E421	23-Sep-2022	29-Sep-2022	----	----		29-Sep-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-DEEP	E358-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) D1-SHALLOW	E358-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-DEEP	E358-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) W1-SHALLOW	E358-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-DEEP	E355-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) D1-SHALLOW	E355-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) TRAVEL BLANK	E355-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-DEEP	E355-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) W1-SHALLOW	E355-L	23-Sep-2022	26-Sep-2022	----	----		27-Sep-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE D1-DEEP	E290	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-SHALLOW	E290	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TRAVEL BLANK	E290	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-DEEP	E290	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-SHALLOW	E290	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	14 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-DEEP	E329	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-SHALLOW	E329	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE TRAVEL BLANK	E329	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-DEEP	E329	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE W1-SHALLOW	E329	23-Sep-2022	25-Sep-2022	----	----		25-Sep-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-DEEP	E100	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-SHALLOW	E100	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE TRAVEL BLANK	E100	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-DEEP	E100	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-SHALLOW	E100	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE D1-DEEP	E108	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-SHALLOW	E108	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TRAVEL BLANK	E108	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 W1-DEEP	E108	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-SHALLOW	E108	23-Sep-2022	26-Sep-2022	----	----		26-Sep-2022	0.25 hrs	0.25 hrs	✖ EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-DEEP	E162	23-Sep-2022	----	----	----		28-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-SHALLOW	E162	23-Sep-2022	----	----	----		28-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE TRAVEL BLANK	E162	23-Sep-2022	----	----	----		28-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-DEEP	E162	23-Sep-2022	----	----	----		28-Sep-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-SHALLOW	E162	23-Sep-2022	----	----	----		28-Sep-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-DEEP	E160	23-Sep-2022	----	----	----		29-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-SHALLOW	E160	23-Sep-2022	----	----	----		29-Sep-2022	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : TSS by Gravimetry										
HDPE TRAVEL BLANK	E160	23-Sep-2022	----	----	----		29-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-DEEP	E160	23-Sep-2022	----	----	----		29-Sep-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-SHALLOW	E160	23-Sep-2022	----	----	----		29-Sep-2022	7 days	6 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-DEEP	E870B	23-Sep-2022	29-Sep-2022	28 days	6 days	✓	29-Sep-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-SHALLOW	E870B	23-Sep-2022	29-Sep-2022	28 days	6 days	✓	29-Sep-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE TRAVEL BLANK	E870B	23-Sep-2022	29-Sep-2022	28 days	7 days	✓	29-Sep-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-DEEP	E870B	23-Sep-2022	29-Sep-2022	28 days	7 days	✓	29-Sep-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-SHALLOW	E870B	23-Sep-2022	29-Sep-2022	28 days	7 days	✓	29-Sep-2022	28 days	0 days	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-DEEP	EF870B	23-Sep-2022	----	----	----		25-Sep-2022	48 hrs	49 hrs	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE D1-SHALLOW	EF870B	23-Sep-2022	----	----	----		25-Sep-2022	48 hrs	49 hrs	× EHT
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE TRAVEL BLANK	EF870B	23-Sep-2022	----	----	----		25-Sep-2022	48 hrs	51 hrs	× EHT
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE W1-DEEP	EF870B	23-Sep-2022	----	----	----		25-Sep-2022	48 hrs	51 hrs	× EHT
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE W1-SHALLOW	EF870B	23-Sep-2022	----	----	----		25-Sep-2022	48 hrs	51 hrs	× EHT

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	666156	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	668228	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	664980	1	5	20.0	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	673507	0	11	0.0	5.0	✗
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	666155	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	672387	1	5	20.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664979	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664976	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664977	1	7	14.2	5.0	✓
pH by Meter	E108	666154	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664978	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	666282	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	669811	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	668565	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	668126	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	669406	1	11	9.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	666156	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	668228	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	664980	1	5	20.0	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	673507	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	666155	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	672387	1	5	20.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664979	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664976	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664977	1	7	14.2	5.0	✓
pH by Meter	E108	666154	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	668736	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*
Laboratory Control Samples (LCS) - Continued							
Sulfate in Water by IC	E235.SO4	664978	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	666282	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	669811	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	668565	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	668126	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	669406	1	11	9.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	666156	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	668228	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	664980	1	5	20.0	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	673507	1	11	9.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	664903	1	7	14.2	5.0	✓
Conductivity in Water	E100	666155	1	9	11.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	672387	1	5	20.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664979	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664976	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664977	1	7	14.2	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664978	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	666282	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	669811	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	668565	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	668126	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	669406	1	11	9.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	668228	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	664980	1	5	20.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	672387	1	5	20.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	666176	1	14	7.1	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	664873	1	18	5.5	5.0	✓
Fluoride in Water by IC	E235.F	664979	1	5	20.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	664976	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	664977	1	7	14.2	5.0	✓
Reactive Silica by Colourimetry	E392	668736	1	13	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	664978	1	5	20.0	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 Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	669811	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	668565	1	8	12.5	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	666177	1	15	6.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	668126	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 Calgary - Environmental	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 Calgary - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Calgary - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Calgary - Environmental	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.
Chloride in Water by IC	E235.Cl Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	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 Calgary - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Calgary - Environmental	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Calgary - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Colour (True) by Spectrometer (5 CU)	E329 Calgary - Environmental	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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Calgary - Environmental	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 Calgary - Environmental	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 Phosphorus by Colourimetry (0.002 mg/L)	E372-U Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T Calgary - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U Calgary - Environmental	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 Vancouver - Environmental	Water	APHA 4500-SiO_2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 Calgary - Environmental	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.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B Vancouver - Environmental	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 Calgary - Environmental	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.
Ion Balance using Dissolved Metals	EC101 Calgary - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B Vancouver - Environmental	Water	CALC	Convert results to sample concentration based on support lab filter information.
Chlorophyll-a Filtration by Support Laboratory	EF870B Calgary - Environmental	Water	EPA 445.0 (mod)	Filtration for chlorophyll-a analysis

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Calgary - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Total Organic Carbon by Combustion	EP355 Calgary - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 Calgary - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 Calgary - Environmental	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 Calgary - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202687**	Page	: 1 of 10
Amendment	: **1**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Leah Hull	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: ----	Date Samples Received	: 23-Sep-2022 12:19
PO	: ----	Date Analysis Commenced	: 25-Sep-2022
C-O-C number	: 2022-Sept-MON8/9-Day 1	Issue Date	: 10-May-2023 15:55
Sampler	: ---- 250 334 3042		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Sean Zhang	Account Manager	Calgary Administration, Calgary, Alberta
Summie Lo	Lab Assistant	Calgary Metals, Calgary, Alberta
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 664903)											
FJ2202682-001	Anonymous	Colour, true	----	E329	5.0	CU	6.6	7.1	0.5	Diff <2x LOR	----
Physical Tests (QC Lot: 666154)											
CG2213147-001	Anonymous	pH	----	E108	0.10	pH units	8.09	8.12	0.370%	4%	----
Physical Tests (QC Lot: 666155)											
CG2213147-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	302	306	1.32%	10%	----
Physical Tests (QC Lot: 666156)											
CG2213147-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	122	119	2.73%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	122	119	2.73%	20%	----
Physical Tests (QC Lot: 666282)											
CG2213144-006	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	286	292	2.08%	20%	----
Physical Tests (QC Lot: 669406)											
FJ2202687-001	W1-SHALLOW	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664873)											
CG2213122-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664976)											
FJ2202687-001	W1-SHALLOW	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0487	0.0496	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664977)											
FJ2202687-001	W1-SHALLOW	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0038	0.0037	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664978)											
FJ2202687-001	W1-SHALLOW	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	11.6	11.5	0.539%	20%	----
Anions and Nutrients (QC Lot: 664979)											
FJ2202687-001	W1-SHALLOW	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.031	0.032	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 664980)											
FJ2202687-001	W1-SHALLOW	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 668126)											
CG2213126-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0040	mg/L	0.103	0.104	0.803%	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*
Anions and Nutrients (QC Lot: 668228)											
CG2213148-024	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0312	0.0356	0.0044	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 668565)											
FJ2202687-001	W1-SHALLOW	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.111	0.099	0.012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 668736)											
CG2213135-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	1.77	1.76	0.007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 669811)											
CG2213080-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0051	0.0049	0.0002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 666176)											
CG2213141-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 666177)											
CG2213141-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 672387)											
FJ2202687-001	W1-SHALLOW	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	26.8	25.9	3.24%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	6.04	6.04	0.0597%	20%	----

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: 664903)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 666155)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 666156)						
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: 666282)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 669406)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 664873)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 664976)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 664977)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 664978)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 664979)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 664980)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 668126)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 668228)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 668565)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 668736)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 668736) - continued						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 669811)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 666176)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 666177)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 672387)						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Plant Pigments (QCLot: 673507)						
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	# 0.0128	B

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 664903)									
Colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 666154)									
pH	----	E108	----	pH units	7 pH units	101	98.6	101	----
Physical Tests (QCLot: 666155)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	97.2	90.0	110	----
Physical Tests (QCLot: 666156)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	96.7	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Physical Tests (QCLot: 666282)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	90.4	85.0	115	----
Physical Tests (QCLot: 669406)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	98.0	85.0	115	----
Anions and Nutrients (QCLot: 664873)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	93.7	80.0	120	----
Anions and Nutrients (QCLot: 664976)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.7	90.0	110	----
Anions and Nutrients (QCLot: 664977)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 664978)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 664979)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 664980)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 668126)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	92.8	80.0	120	----
Anions and Nutrients (QCLot: 668228)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 668565)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 668736)									

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 668736) - continued									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 669811)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	98.0	80.0	120	----
Organic / Inorganic Carbon (QCLot: 666176)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.3	80.0	120	----
Organic / Inorganic Carbon (QCLot: 666177)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	96.0	80.0	120	----
Dissolved Metals (QCLot: 672387)									
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	109	80.0	120	----
Plant Pigments (QCLot: 673507)									
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	94.6	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: 664873)										
CG2213122-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0445 mg/L	0.05 mg/L	89.1	70.0	130	----
Anions and Nutrients (QCLot: 664976)										
FJ2202687-002	W1-DEEP	Nitrate (as N)	14797-55-8	E235.NO3-L	2.43 mg/L	2.5 mg/L	97.4	75.0	125	----
Anions and Nutrients (QCLot: 664977)										
FJ2202687-002	W1-DEEP	Nitrite (as N)	14797-65-0	E235.NO2-L	0.496 mg/L	0.5 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 664978)										
FJ2202687-002	W1-DEEP	Sulfate (as SO4)	14808-79-8	E235.SO4	96.2 mg/L	100 mg/L	96.2	75.0	125	----
Anions and Nutrients (QCLot: 664979)										
FJ2202687-002	W1-DEEP	Fluoride	16984-48-8	E235.F	0.980 mg/L	1 mg/L	98.0	75.0	125	----
Anions and Nutrients (QCLot: 664980)										
FJ2202687-002	W1-DEEP	Chloride	16887-00-6	E235.Cl	97.3 mg/L	100 mg/L	97.3	75.0	125	----
Anions and Nutrients (QCLot: 668126)										
CG2213126-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 668228)										
CG2213159-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 668565)										
FJ2202687-002	W1-DEEP	Kjeldahl nitrogen, total [TKN]	----	E318	2.41 mg/L	2.5 mg/L	96.6	70.0	130	----
Anions and Nutrients (QCLot: 668736)										
CG2213135-002	Anonymous	Silicate (as SiO2)	7631-86-9	E392	11.2 mg/L	10 mg/L	112	75.0	125	----
Anions and Nutrients (QCLot: 669811)										
CG2213080-002	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0429 mg/L	0.05 mg/L	85.9	70.0	130	----
Organic / Inorganic Carbon (QCLot: 666176)										
CG2213141-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.28 mg/L	5 mg/L	106	70.0	130	----
Organic / Inorganic Carbon (QCLot: 666177)										
CG2213141-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.28 mg/L	5 mg/L	106	70.0	130	----
Dissolved Metals (QCLot: 672387)										
FJ2202687-002	W1-DEEP	Calcium, dissolved	7440-70-2	E421	40.2 mg/L	40 mg/L	100	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 672387) - continued										
FJ2202687-002	W1-DEEP	Magnesium, dissolved	7439-95-4	E421	9.13 mg/L	10 mg/L	91.3	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-Sept-MON8/9- Day 1

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Leah Hull
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- no metals
PO / AFE:	1200-25.03.02
LSD:	

ALS Lab Work Order # (ALS use only):

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	lhull@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sneha Sansare **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Sl, diss ortho P, colour, pH (F/P)	Chlorophyll-a by fluorometry (F)	DOC, Total dissolved P (F/P)	Hardness (F)	NH3, Total Kjeldahl, Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1-Shallow	23-Sept-22	07:20	Water	5	R	R	R	R	R	R			
	W1-Deep	23-Sept-22	07:45	Water	5	R	R	R	R	R	R			
	D1-Shallow	23-Sept-22	09:30	Water	5	R	R	R	R	R	R			
	D1-Deep	23-Sept-22	09:50	Water	5	R	R	R	R	R	R			
	Travel Blank	—	—	Water	1		R							
	Travel Blank	—	—	Water	3	R			R	R	R			

Fort St. John
Work Order Reference
FJ2202687

Phone: +1 250 261 5617

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

Add. for report: csuzanne@ecofishresearch.com,kganshorn@ecofishresearch.com

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
6.3	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	9-23-22	12:14

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202949**	Page	: 1 of 8
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: 2022-OCT-MON8/9-Day 3	Issue Date	: 25-Aug-2023 17:57
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	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*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLIS	Detection Limit Adjusted due to insufficient sample.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	BEA-A	BEA-B	POUCE	PD4	KR
						Client sampling date / time	17-Oct-2022 17:00	17-Oct-2022 17:00	17-Oct-2022 11:45	17-Oct-2022 13:10	17-Oct-2022 14:55
							FJ2202949-001	FJ2202949-002	FJ2202949-003	FJ2202949-004	FJ2202949-005
							Result	Result	Result	Result	Result
Sample Preparation											
Dissolved Fe2 filtration location	----	EP541/VA		-	-		Field	Field	Field	Field	Field
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		185	184	186	77.3	200
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		10.2	10.4	6.4	<1.0	11.8
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L		195	194	192	77.3	212
Colour, true	----	E329/VA	A	5.0	CU		76.3	70.4	14.7	6.0	8.3
Conductivity	----	E100/VA	A	2.0	µS/cm		561	562	1530	181	504
Hardness (as CaCO3), dissolved	----	EC100/VA		0.50	mg/L		195	208	536	88.9	222
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA		0.50	mg/L		210	210	576	97.0	235
pH	----	E108/VA	A	0.10	pH units		8.46	8.46	8.33	8.12	8.46
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L		406	385	1120	106	317
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L		<3.0	<3.0	4.4	7.0	<3.0
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L		0.0074	0.0082	0.0112	<0.0050	0.0104
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L		3.83	3.80	36.0	<0.50	1.84
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L		0.172	0.170	0.252	0.041	0.122
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L		0.573	0.568	0.650	0.109	0.270
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L		<0.0050	<0.0050	<0.0250 DLDS	0.0526	0.0915
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0050 DLDS	<0.0010	0.0030
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L		0.573	0.568	0.650	0.162	0.364
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L		0.0016	0.0022	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L		0.0220	0.0219	0.0176	0.0260	0.0034
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L		0.0042	0.0048	0.0047	<0.0020	0.0092
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L		0.85	0.84	0.82	4.08	<0.50
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L		105	106	625	13.7	66.5
Nitrate + Nitrite (as N)	----	EC235.N+N/VA		0.0032	mg/L		<0.0051	<0.0051	<0.0255	0.0526	0.0945

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID: BEA-A	BEA-B	POUCE	PD4	KR
Client sampling date / time						17-Oct-2022 17:00	17-Oct-2022 17:00	17-Oct-2022 11:45	17-Oct-2022 13:10	17-Oct-2022 14:55
						FJ2202949-001	FJ2202949-002	FJ2202949-003	FJ2202949-004	FJ2202949-005
						Result	Result	Result	Result	Result
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L	21.0	22.5	14.2	2.93	6.88
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L	22.0	23.3	15.0	2.94	6.91
Ion Balance										
Anion sum	----	EC101/VA		0.10	meq/L	6.20	6.20	17.9	1.84	5.69
Cation sum	----	EC101/VA		0.10	meq/L	6.30	6.60	17.6	1.84	5.87
Ion balance (APHA)	----	EC101/VA		0.010	%	0.800	3.12	0.845	<0.010	1.56
Total Metals										
Aluminum, total	7429-90-5	E420/VA	A	0.0030	mg/L	0.110	0.105	0.152	0.230	0.0508
Antimony, total	7440-36-0	E420/VA	A	0.00010	mg/L	0.00014	0.00014	0.00017	<0.00010	0.00015
Arsenic, total	7440-38-2	E420/VA	A	0.00010	mg/L	0.00085	0.00082	0.00071	0.00039	0.00059
Barium, total	7440-39-3	E420/VA	A	0.00010	mg/L	0.0972	0.0978	0.0743	0.0424	0.157
Beryllium, total	7440-41-7	E420/VA	A	0.000020	mg/L	<0.000020	0.000022	<0.000020	<0.000020	<0.000020
Bismuth, total	7440-69-9	E420/VA	A	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420/VA	A	0.010	mg/L	0.054	0.054	0.162	<0.010	0.032
Cadmium, total	7440-43-9	E420/VA	A	0.0000050	mg/L	0.0000285	0.0000312	0.0000109	0.0000294	<0.0000050
Calcium, total	7440-70-2	E420/VA	A	0.050	mg/L	55.8	56.9	136	28.0	55.3
Cesium, total	7440-46-2	E420/VA	A	0.000010	mg/L	0.000018	0.000017	0.000030	0.000053	0.000012
Chromium, total	7440-47-3	E420/VA	A	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, total	7440-48-4	E420/VA	A	0.00010	mg/L	0.00028	0.00028	0.00034	0.00018	<0.00010
Copper, total	7440-50-8	E420/VA	A	0.00050	mg/L	0.00202	0.00197	0.00190	0.00106	0.00142
Iron, total	7439-89-6	E420/VA	A	0.010	mg/L	0.749	0.701	0.237	0.443	0.063
Lead, total	7439-92-1	E420/VA	A	0.000050	mg/L	0.000160	0.000156	0.000117	0.000199	<0.000050
Lithium, total	7439-93-2	E420/VA	A	0.0010	mg/L	0.0089	0.0090	0.0310	0.0015	0.0076
Magnesium, total	7439-95-4	E420/VA	A	0.0050	mg/L	17.1	16.5	57.5	6.57	23.5
Manganese, total	7439-96-5	E420/VA	A	0.00010	mg/L	0.0577	0.0562	0.109	0.0105	0.00518
Mercury, total	7439-97-6	E508-L/VA	A	0.50	ng/L	3.53	3.26	1.88	2.58	1.36
Molybdenum, total	7439-98-7	E420/VA	A	0.000050	mg/L	0.00112	0.00114	0.00153	0.000827	0.00139
Nickel, total	7440-02-0	E420/VA	A	0.00050	mg/L	0.00406	0.00401	0.00644	0.00125	0.00165
Phosphorus, total	7723-14-0	E420/VA	A	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, total	7440-09-7	E420/VA	A	0.050	mg/L	2.39	2.35	10.7	0.539	2.26

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	BEA-A	BEA-B	POUCE	PD4	KR
						Client sampling date / time	17-Oct-2022 17:00	17-Oct-2022 17:00	17-Oct-2022 11:45	17-Oct-2022 13:10	17-Oct-2022 14:55
							FJ2202949-001	FJ2202949-002	FJ2202949-003	FJ2202949-004	FJ2202949-005
							Result	Result	Result	Result	Result
Total Metals											
Rubidium, total	7440-17-7	E420/VA	A	0.00020	mg/L		0.00108	0.00111	0.00243	0.00083	0.00068
Selenium, total	7782-49-2	E420/VA	A	0.000050	mg/L		0.000369	0.000314	0.000582	0.000305	0.000178
Silicon, total	7440-21-3	E420/VA	A	0.10	mg/L		0.55	0.57	0.80	2.36	0.18
Silver, total	7440-22-4	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, total	7440-23-5	E420/VA	A	0.050	mg/L		53.4	52.8	158	1.27	31.6
Strontium, total	7440-24-6	E420/VA	A	0.00020	mg/L		0.227	0.229	0.660	0.108	0.332
Sulfur, total	7704-34-9	E420/VA	A	0.50	mg/L		38.0	38.1	242	4.69	24.5
Tellurium, total	13494-80-9	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	7440-28-0	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	0.000015	<0.000010	<0.000010
Thorium, total	7440-29-1	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	7440-31-5	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420/VA	A	0.00030	mg/L		0.00527	0.00528	<0.00390 DLM	0.00403	0.00145
Tungsten, total	7440-33-7	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, total	7440-61-1	E420/VA	A	0.000010	mg/L		0.00166	0.00167	0.00303	0.000436	0.00123
Vanadium, total	7440-62-2	E420/VA	A	0.00050	mg/L		0.00074	0.00067	0.00062	0.00147	<0.00050
Zinc, total	7440-66-6	E420/VA	A	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium, total	7440-67-7	E420/VA	A	0.00020	mg/L		0.00043	<0.00060 DLM	0.00028	<0.00020	<0.00020
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	A	0.0010	mg/L		0.0065	0.0069	0.0025	0.0040	0.0017
Antimony, dissolved	7440-36-0	E421/VA	A	0.00010	mg/L		0.00013	0.00014	0.00017	<0.00010	0.00015
Arsenic, dissolved	7440-38-2	E421/VA	A	0.00010	mg/L		0.00054	0.00056	0.00058	0.00020	0.00051
Barium, dissolved	7440-39-3	E421/VA	A	0.00010	mg/L		0.0883	0.0893	0.0679	0.0349	0.149
Beryllium, dissolved	7440-41-7	E421/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth, dissolved	7440-69-9	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, dissolved	7440-42-8	E421/VA	A	0.010	mg/L		0.046	0.048	0.139	<0.010	0.027
Cadmium, dissolved	7440-43-9	E421/VA	A	0.0000050	mg/L		0.0000080	0.0000119	<0.0000050	<0.0000050	<0.0000050
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L		52.2	57.3	126	25.8	51.6
Cesium, dissolved	7440-46-2	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium, dissolved	7440-47-3	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/VA	A	0.00010	mg/L		0.00021	0.00023	0.00023	<0.00010	<0.00010

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	BEA-A	BEA-B	POUCE	PD4	KR
						Client sampling date / time	17-Oct-2022 17:00	17-Oct-2022 17:00	17-Oct-2022 11:45	17-Oct-2022 13:10	17-Oct-2022 14:55
							FJ2202949-001	FJ2202949-002	FJ2202949-003	FJ2202949-004	FJ2202949-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Copper, dissolved	7440-50-8	E421/VA	A	0.00020	mg/L		0.00161	0.00165	0.00153	0.00058	0.00119
Iron, dissolved	7439-89-6	E421/VA	A	0.010	mg/L		0.046	0.066	<0.010	<0.010	<0.010
Lead, dissolved	7439-92-1	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium, dissolved	7439-93-2	E421/VA	A	0.0010	mg/L		0.0085	0.0091	0.0291	0.0012	0.0069
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L		15.8	15.9	53.9	5.95	22.7
Manganese, dissolved	7439-96-5	E421/VA	A	0.00010	mg/L		0.0150	0.0159	0.0180	0.00094	0.00283
Mercury, dissolved	7439-97-6	E509-L/VA	A	0.50	ng/L		2.12	2.79	2.49	1.41	0.80
Molybdenum, dissolved	7439-98-7	E421/VA	A	0.000050	mg/L		0.00106	0.00106	0.00146	0.000796	0.00128
Nickel, dissolved	7440-02-0	E421/VA	A	0.00050	mg/L		0.00352	0.00366	0.00571	0.00067	0.00146
Phosphorus, dissolved	7723-14-0	E421/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, dissolved	7440-09-7	E421/VA	A	0.050	mg/L		2.28	2.43	9.82	0.435	2.21
Rubidium, dissolved	7440-17-7	E421/VA	A	0.00020	mg/L		0.00090	0.00102	0.00218	0.00029	0.00061
Selenium, dissolved	7782-49-2	E421/VA	A	0.000050	mg/L		0.000323	0.000347	0.000582	0.000263	0.000243
Silicon, dissolved	7440-21-3	E421/VA	A	0.050	mg/L		0.312	0.331	0.351	1.80	<0.050
Silver, dissolved	7440-22-4	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421/VA	A	0.050	mg/L		53.7	54.4	153	1.18	31.5
Strontium, dissolved	7440-24-6	E421/VA	A	0.00020	mg/L		0.229	0.220	0.596	0.110	0.323
Sulfur, dissolved	7704-34-9	E421/VA	A	0.50	mg/L		36.3	35.9	225	4.27	23.2
Tellurium, dissolved	13494-80-9	E421/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, dissolved	7440-28-0	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	0.000012	<0.000010	<0.000010
Thorium, dissolved	7440-29-1	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin, dissolved	7440-31-5	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, dissolved	7440-32-6	E421/VA	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten, dissolved	7440-33-7	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, dissolved	7440-61-1	E421/VA	A	0.000010	mg/L		0.00172	0.00165	0.00298	0.000402	0.00115
Vanadium, dissolved	7440-62-2	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc, dissolved	7440-66-6	E421/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium, dissolved	7440-67-7	E421/VA	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved MeHg filtration location	----	EP537/VA		-	-		Field	Field	Field	Field	Field
Dissolved mercury filtration location	----	EP509-L/VA		-	-		Field	Field	Field	Field	Field

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	BEA-A	BEA-B	POUCE	PD4	KR
						Client sampling date / time	17-Oct-2022 17:00	17-Oct-2022 17:00	17-Oct-2022 11:45	17-Oct-2022 13:10	17-Oct-2022 14:55
							FJ2202949-001	FJ2202949-002	FJ2202949-003	FJ2202949-004	FJ2202949-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Dissolved metals filtration location	----	EP421/VA		-	-		Field	Field	Field	Field	Field
Speciated Metals											
Methylmercury (as MeHg), total	22967-92-6	E536/VA	A	0.000000020	mg/L		0.000000074 DTC	0.000000130	0.000000038	<0.000000020	<0.000000080 DLIS
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	A	0.020	mg/L		0.046	0.061	<0.020	<0.020	<0.020
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	A	0.000000020	mg/L		0.000000125 DTC	0.000000132	<0.000000020	<0.000000020	<0.000000040 DLIS

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	: **FJ2202949**	Page	: 1 of 25
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:57
C-O-C number	: 2022-OCT-MON8/9-Day 3		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BEA-A	E298	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) BEA-B	E298	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) KR	E298	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD4	E298	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) POUCE	E298	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEA-A	E235.Cl	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE BEA-B	E235.Cl	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
HDPE KR	E235.Cl	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD4	E235.Cl	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE POUCE	E235.Cl	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA-A	E378-U	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE BEA-B	E378-U	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE KR	E378-U	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD4	E378-U	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE POUCE	E378-U	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA-A	E235.F	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE BEA-B	E235.F	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE KR	E235.F	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD4	E235.F	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE POUCE	E235.F	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA-A	E235.NO3-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE BEA-B	E235.NO3-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE KR	E235.NO3-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD4	E235.NO3-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE										
POUCE	E235.NO3-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
BEA-A	E235.NO2-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
BEA-B	E235.NO2-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
KR	E235.NO2-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
PD4	E235.NO2-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
POUCE	E235.NO2-L	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
BEA-A	E392	17-Oct-2022	----	----	----		19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
BEA-B	E392	17-Oct-2022	----	----	----		19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
KR	E392	17-Oct-2022	----	----	----		19-Oct-2022	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PD4	E392	17-Oct-2022	----	----	----		19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE POUCE	E392	17-Oct-2022	----	----	----		19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA-A	E235.SO4	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE BEA-B	E235.SO4	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE KR	E235.SO4	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD4	E235.SO4	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE POUCE	E235.SO4	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	19-Oct-2022	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA-A	E375-T	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) BEA-B	E375-T	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) KR	E375-T	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD4	E375-T	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) POUCE	E375-T	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) BEA-A	E366	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) BEA-B	E366	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) KR	E366	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD4	E366	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) POUCE	E366	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA-A	E372-U	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BEA-B	E372-U	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) KR	E372-U	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD4	E372-U	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) POUCE	E372-U	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) BEA-A	E509-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) BEA-B	E509-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) KR	E509-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD4	E509-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) POUCE	E509-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEA-A	E421	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) BEA-B	E421	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) KR	E421	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PD4	E421	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) POUCE	E421	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA-A	E358-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) BEA-B	E358-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) KR	E358-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD4	E358-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) POUCE	E358-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA-A	E355-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) BEA-B	E355-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) KR	E355-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD4	E355-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) POUCE	E355-L	17-Oct-2022	20-Oct-2022	28 days	3 days	✓	20-Oct-2022	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA-A	E290	17-Oct-2022	19-Oct-2022	14 days	2 days	✓	22-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE BEA-B	E290	17-Oct-2022	19-Oct-2022	14 days	2 days	✓	22-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE KR	E290	17-Oct-2022	19-Oct-2022	14 days	2 days	✓	22-Oct-2022	14 days	5 days	✓

Matrix: **Water**

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Analyte Group / 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 : Alkalinity Species by Titration										
HDPE PD4	E290	17-Oct-2022	19-Oct-2022	14 days	2 days	✓	22-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE POUCE	E290	17-Oct-2022	19-Oct-2022	14 days	2 days	✓	22-Oct-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE BEA-A	E329	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE BEA-B	E329	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE KR	E329	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD4	E329	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE POUCE	E329	17-Oct-2022	19-Oct-2022	3 days	2 days	✓	19-Oct-2022	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA-A	E100	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	22-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE BEA-B	E100	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	22-Oct-2022	28 days	5 days	✓

Matrix: **Water**

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Analyte Group / 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 : Conductivity in Water										
HDPE KR	E100	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	22-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD4	E100	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	22-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE POUCE	E100	17-Oct-2022	19-Oct-2022	28 days	2 days	✓	22-Oct-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE BEA-A	E108	17-Oct-2022	19-Oct-2022	0.25 hrs	52 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	118 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE BEA-B	E108	17-Oct-2022	19-Oct-2022	0.25 hrs	52 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	118 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE KR	E108	17-Oct-2022	19-Oct-2022	0.25 hrs	54 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	120 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD4	E108	17-Oct-2022	19-Oct-2022	0.25 hrs	56 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	122 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE POUCE	E108	17-Oct-2022	19-Oct-2022	0.25 hrs	57 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	123 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE BEA-A	E162	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓

Matrix: **Water**

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Analyte Group / 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 BEA-B	E162	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE KR	E162	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD4	E162	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE POUCE	E162	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA-A	E160	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE BEA-B	E160	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE KR	E160	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD4	E160	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE POUCE	E160	17-Oct-2022	----	----	----		19-Oct-2022	7 days	2 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) BEA-A	E541	17-Oct-2022	24-Nov-2022	7 days	38 days	× EHT	24-Nov-2022	7 days	38 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) BEA-B	E541	17-Oct-2022	24-Nov-2022	7 days	38 days	× EHT	24-Nov-2022	7 days	38 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) KR	E541	17-Oct-2022	24-Nov-2022	7 days	38 days	× EHT	24-Nov-2022	7 days	38 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PD4	E541	17-Oct-2022	24-Nov-2022	7 days	38 days	× EHT	24-Nov-2022	7 days	38 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) POUCE	E541	17-Oct-2022	24-Nov-2022	7 days	38 days	× EHT	24-Nov-2022	7 days	38 days	× EHT
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) BEA-A	E537	17-Oct-2022	04-Nov-2022	180 days	18 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) BEA-B	E537	17-Oct-2022	04-Nov-2022	180 days	18 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) KR	E537	17-Oct-2022	04-Nov-2022	180 days	18 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD4	E537	17-Oct-2022	04-Nov-2022	180 days	18 days	✓	10-Nov-2022	180 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) POUCE	E537	17-Oct-2022	04-Nov-2022	180 days	18 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) BEA-A	E536	17-Oct-2022	03-Nov-2022	180 days	17 days	✓	07-Nov-2022	180 days	21 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) BEA-B	E536	17-Oct-2022	03-Nov-2022	180 days	17 days	✓	07-Nov-2022	180 days	21 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) KR	E536	17-Oct-2022	03-Nov-2022	180 days	17 days	✓	07-Nov-2022	180 days	21 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PD4	E536	17-Oct-2022	03-Nov-2022	180 days	17 days	✓	07-Nov-2022	180 days	21 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) POUCE	E536	17-Oct-2022	03-Nov-2022	180 days	17 days	✓	07-Nov-2022	180 days	21 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) BEA-A	E508-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) BEA-B	E508-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) KR	E508-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD4	E508-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) POUCE	E508-L	17-Oct-2022	25-Oct-2022	28 days	8 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) BEA-A	E420	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) BEA-B	E420	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) KR	E420	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) PD4	E420	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) POUCE	E420	17-Oct-2022	20-Oct-2022	180 days	3 days	✓	20-Oct-2022	180 days	3 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	704570	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	705240	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	704574	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	704580	1	13	7.6	5.0	✓
Conductivity in Water	E100	704571	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	704058	1	14	7.1	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	705235	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	704579	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	704573	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	704575	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	704576	1	18	5.5	5.0	✓
pH by Meter	E108	704569	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	704461	2	20	10.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704577	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	704380	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	705239	1	9	11.1	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	704100	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	2	50	4.0	5.0	✗
Total Nitrogen by Colourimetry	E366	705237	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	705236	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	705238	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	704394	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	704570	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	705240	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	704574	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	704580	1	13	7.6	5.0	✓
Conductivity in Water	E100	704571	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	704058	1	14	7.1	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	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							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	705235	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	704579	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	704573	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	704575	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	704576	1	18	5.5	5.0	✓
pH by Meter	E108	704569	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	704461	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704577	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	704380	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	705239	1	9	11.1	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	704100	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	3	50	6.0	5.0	✓
Total Nitrogen by Colourimetry	E366	705237	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	705236	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	705238	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	704394	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	704570	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	705240	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	704574	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	704580	1	13	7.6	5.0	✓
Conductivity in Water	E100	704571	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	704058	1	14	7.1	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	705235	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	704579	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	704573	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	704575	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	704576	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	704461	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704577	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	704380	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	705239	1	9	11.1	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	704100	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	3	50	6.0	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*
Method Blanks (MB) - Continued							
Total Nitrogen by Colourimetry	E366	705237	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	705236	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	705238	1	9	11.1	5.0	✓
TSS by Gravimetry	E160	704394	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	705240	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	704574	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	704058	1	14	7.1	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	705235	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	704579	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	704573	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	704575	1	19	5.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	704576	1	18	5.5	5.0	✓
Reactive Silica by Colourimetry	E392	704461	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	704577	1	18	5.5	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	705239	1	9	11.1	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	704100	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	2	50	4.0	5.0	×
Total Nitrogen by Colourimetry	E366	705237	1	9	11.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	705236	1	9	11.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	705238	1	9	11.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
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.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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 (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202949**	Page	: 1 of 19
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.02	Date Analysis Commenced	: 19-Oct-2022
C-O-C number	: 2022-OCT-MON8/9-Day 3	Issue Date	: 25-Aug-2023 17:57
Sampler	: Pat Beaupre ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	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: 704380)											
FJ2202949-001	BEA-A	Solids, total dissolved [TDS]	----	E162	20	mg/L	406	410	0.858%	20%	----
Physical Tests (QC Lot: 704394)											
FJ2202949-001	BEA-A	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 704569)											
FJ2202949-003	POUCE	pH	----	E108	0.10	pH units	8.33	8.34	0.120%	4%	----
Physical Tests (QC Lot: 704570)											
FJ2202949-003	POUCE	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	186	186	0.269%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	6.4	6.6	0.2	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	192	192	0.156%	20%	----
Physical Tests (QC Lot: 704571)											
FJ2202949-003	POUCE	Conductivity	----	E100	2.0	µS/cm	1530	1510	1.31%	10%	----
Physical Tests (QC Lot: 704580)											
FJ2202949-001	BEA-A	Colour, true	----	E329	5.0	CU	76.3	75.3	1.27%	20%	----
Anions and Nutrients (QC Lot: 704461)											
CG2213996-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	8.01	7.98	0.328%	20%	----
CG2213996-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	8.01	8.02	0.126%	20%	----
Anions and Nutrients (QC Lot: 704573)											
FJ2202968-004	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.215	0.216	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704574)											
FJ2202968-004	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704575)											
FJ2202968-004	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.0648	0.0634	0.0014	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704576)											
FJ2202968-004	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	0.0085	0.0095	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 704577)											
FJ2202968-004	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	537	536	0.00925%	20%	----
Anions and Nutrients (QC Lot: 704579)											
FJ2202949-001	BEA-A	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0016	0.0016	0.000001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 705237)											

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
Anions and Nutrients (QC Lot: 705237) - continued											
FJ2202949-001	BEA-A	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.573	0.576	0.663%	20%	----
Anions and Nutrients (QC Lot: 705238)											
FJ2202949-001	BEA-A	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0220	0.0221	0.726%	20%	----
Anions and Nutrients (QC Lot: 705239)											
FJ2202949-001	BEA-A	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0042	0.0045	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 705240)											
FJ2202949-001	BEA-A	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0074	0.0076	0.0002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 705235)											
FJ2202949-001	BEA-A	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	21.0	22.4	6.17%	20%	----
Organic / Inorganic Carbon (QC Lot: 705236)											
FJ2202949-001	BEA-A	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	22.0	23.2	5.29%	20%	----
Total Metals (QC Lot: 704100)											
FJ2202949-001	BEA-A	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.110	0.111	1.08%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00014	0.00014	0.0000007	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00085	0.00088	0.00004	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0972	0.105	7.73%	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	0.054	0.055	0.0010	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000285	0.0000241	0.0000044	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	55.8	57.3	2.64%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000018	0.000016	0.000002	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	0.00028	0.00029	0.000010	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00202	0.00195	0.00007	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.749	0.737	1.63%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000160	0.000159	0.000001	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0089	0.0091	0.0002	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	17.1	16.0	6.68%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0577	0.0569	1.38%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00112	0.00114	1.71%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00406	0.00411	0.00005	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	2.39	2.37	0.740%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 704100) - continued											
FJ2202949-001	BEA-A	Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00108	0.00107	0.000004	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000369	0.000293	0.000076	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	0.55	0.61	0.06	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	53.4	52.8	1.10%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.227	0.233	2.57%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	38.0	39.3	3.43%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00527	0.00481	9.10%	20%	----
		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	0.00166	0.00167	0.803%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00074	0.00070	0.00004	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00043	0.00048	0.00005	Diff <2x LOR	----
Total Metals (QC Lot: 712785)											
CG2214494-007	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 704058)											
FJ2202949-001	BEA-A	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0065	0.0064	0.0001	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00013	0.00014	0.000003	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00054	0.00057	0.00003	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0883	0.0892	0.919%	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	0.046	0.043	0.003	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000080	0.0000115	0.0000034	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	52.2	50.4	3.59%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00021	0.00021	0.000005	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00161	0.00160	0.00002	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.046	0.046	0.0007	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 704058) - continued											
FJ2202949-001	BEA-A	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	0.0085	0.0080	0.0005	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	15.8	15.7	1.20%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0150	0.0153	1.61%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00106	0.00110	3.91%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00352	0.00350	0.00001	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	2.28	2.29	0.241%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00090	0.00084	0.00006	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000323	0.000309	0.000014	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.312	0.311	0.0007	Diff <2x LOR	----
		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	53.7	52.5	2.29%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.229	0.224	2.54%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	36.3	36.0	1.03%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00172	0.00164	4.82%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 713015)											
FJ2202949-001	BEA-A	Mercury, dissolved	7439-97-6	E509-L	0.50	ng/L	2.12	2.73	0.60	Diff <2x LOR	----
Speciated Metals (QC Lot: 726346)											
FJ2202949-001	BEA-A	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	0.000000074 mg/L	0.000095	0.000021	Diff <2x LOR	----
Speciated Metals (QC Lot: 728312)											
FJ2202949-005	KR	Methylmercury (as MeHg), total	22967-92-6	E536	0.000080	µg/L	<0.000000080 mg/L	<0.000080	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 730526)											
FJ2202949-001	BEA-A	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000000125 mg/L	0.000149	17.0%	30%	----

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*
Speciated Metals (QC Lot: 756854)											
FJ2202949-001	BEA-A	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.046	0.046	0.0002	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: 704380)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 704394)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 704570)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 704571)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 704580)						
Colour, true	----	E329	5	CU	<5.0	----
Anions and Nutrients (QCLot: 704461)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 704573)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 704574)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 704575)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 704576)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 704577)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 704579)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 705237)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 705238)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 705239)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 705240)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 705235)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 705236)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 704100)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 704100) - continued						
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 712785)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 704058)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 704058) - continued						
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 713015)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 726346)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 728312)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 730526)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 740379)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 756854)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 704380)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 704394)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.3	85.0	115	----
Physical Tests (QCLot: 704569)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 704570)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Physical Tests (QCLot: 704571)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.2	90.0	110	----
Physical Tests (QCLot: 704580)									
Colour, true	----	E329	5	CU	100 CU	100	85.0	115	----
Anions and Nutrients (QCLot: 704461)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 704573)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.8	90.0	110	----
Anions and Nutrients (QCLot: 704574)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 704575)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 704576)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 704577)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 704579)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	97.3	80.0	120	----
Anions and Nutrients (QCLot: 705237)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 705238)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.8	80.0	120	----
Anions and Nutrients (QCLot: 705239)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.7	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 705240)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	97.7	85.0	115	----
Organic / Inorganic Carbon (QCLot: 705235)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 705236)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Metals (QCLot: 704100)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	97.7	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	100	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	98.3	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	99.0	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.1	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.8	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	97.0	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	95.2	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	96.8	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	94.3	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	106	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	100	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	95.3	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	97.2	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	95.8	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.0	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	96.2	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	99.2	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	97.0	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	98.0	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	97.1	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	96.1	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	97.8	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 704100) - continued									
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	88.7	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	96.1	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	91.4	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.6	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	90.8	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	96.6	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	96.6	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.4	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Total Metals (QCLot: 712785)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	112	80.0	120	----
Dissolved Metals (QCLot: 704058)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.4	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	95.1	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.9	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.1	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	81.4	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.5	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	97.3	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.8	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	94.6	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	104	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	98.2	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	91.1	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	100	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	99.2	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.4	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	95.4	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	87.5	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 704058) - continued									
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	94.0	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	99.6	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	92.7	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.4	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	85.2	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	92.9	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	91.3	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	98.1	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.2	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	98.9	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	96.1	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	94.3	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	102	80.0	120	----
Speciated Metals (QCLot: 726346)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	85.7	70.0	130	----
Speciated Metals (QCLot: 728312)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	76.3	70.0	130	----
Speciated Metals (QCLot: 730526)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	79.4	70.0	130	----
Speciated Metals (QCLot: 740379)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.8	70.0	130	----
Speciated Metals (QCLot: 756854)									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	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: 704461)										
CG2214293-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	10.2 mg/L	10 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 704573)										
FJ2202969-001	Anonymous	Fluoride	16984-48-8	E235.F	4.95 mg/L	5 mg/L	98.9	75.0	125	----
Anions and Nutrients (QCLot: 704574)										
FJ2202969-001	Anonymous	Chloride	16887-00-6	E235.Cl	515 mg/L	500 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 704575)										
FJ2202969-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	13.2 mg/L	12.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 704576)										
FJ2202969-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	2.49 mg/L	2.5 mg/L	99.6	75.0	125	----
Anions and Nutrients (QCLot: 704577)										
FJ2202969-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	500 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 704579)										
FJ2202949-002	BEA-B	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0353 mg/L	0.03 mg/L	118	70.0	130	----
Anions and Nutrients (QCLot: 705237)										
FJ2202949-002	BEA-B	Nitrogen, total	7727-37-9	E366	ND mg/L	0.4 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 705238)										
FJ2202949-002	BEA-B	Phosphorus, total	7723-14-0	E372-U	0.0487 mg/L	0.05 mg/L	97.4	70.0	130	----
Anions and Nutrients (QCLot: 705239)										
FJ2202949-002	BEA-B	Phosphorus, total dissolved	7723-14-0	E375-T	0.0485 mg/L	0.05 mg/L	97.1	70.0	130	----
Anions and Nutrients (QCLot: 705240)										
FJ2202949-002	BEA-B	Ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
Organic / Inorganic Carbon (QCLot: 705235)										
FJ2202949-002	BEA-B	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 705236)										
FJ2202949-002	BEA-B	Carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 704100)										
FJ2202949-002	BEA-B	Aluminum, total	7429-90-5	E420	0.185 mg/L	0.2 mg/L	92.6	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: 704100) - continued										
FJ2202949-002	BEA-B	Antimony, total	7440-36-0	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0435 mg/L	0.04 mg/L	109	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00834 mg/L	0.01 mg/L	83.4	70.0	130	----
		Boron, total	7440-42-8	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00388 mg/L	0.004 mg/L	97.1	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00978 mg/L	0.01 mg/L	97.8	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		Copper, total	7440-50-8	E420	0.0185 mg/L	0.02 mg/L	92.6	70.0	130	----
		Iron, total	7439-89-6	E420	1.96 mg/L	2 mg/L	97.9	70.0	130	----
		Lead, total	7439-92-1	E420	0.0172 mg/L	0.02 mg/L	86.0	70.0	130	----
		Lithium, total	7439-93-2	E420	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.00 mg/L	10 mg/L	100.0	70.0	130	----
		Potassium, total	7440-09-7	E420	4.10 mg/L	4 mg/L	102	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0421 mg/L	0.04 mg/L	105	70.0	130	----
		Silicon, total	7440-21-3	E420	9.84 mg/L	10 mg/L	98.4	70.0	130	----
		Silver, total	7440-22-4	E420	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0371 mg/L	0.04 mg/L	92.8	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00354 mg/L	0.004 mg/L	88.4	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		Tin, total	7440-31-5	E420	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00372 mg/L	0.004 mg/L	93.1	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: 704100) - continued										
FJ2202949-002	BEA-B	Vanadium, total	7440-62-2	E420	0.0997 mg/L	0.1 mg/L	99.7	70.0	130	----
		Zinc, total	7440-66-6	E420	0.364 mg/L	0.4 mg/L	90.9	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0449 mg/L	0.04 mg/L	112	70.0	130	----
Total Metals (QCLot: 712785)										
CG2214545-001	Anonymous	Mercury, total	7439-97-6	E508-L	6.41 ng/L	5 ng/L	128	70.0	130	----
Dissolved Metals (QCLot: 704058)										
FJ2202949-002	BEA-B	Aluminum, dissolved	7429-90-5	E421	0.197 mg/L	0.2 mg/L	98.7	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0391 mg/L	0.04 mg/L	97.8	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00866 mg/L	0.01 mg/L	86.6	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.077 mg/L	0.1 mg/L	76.8	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00379 mg/L	0.004 mg/L	94.8	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0187 mg/L	0.02 mg/L	93.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.94 mg/L	2 mg/L	97.0	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0926 mg/L	0.1 mg/L	92.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0180 mg/L	0.02 mg/L	90.2	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.0 mg/L	10 mg/L	100	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	4.01 mg/L	4 mg/L	100	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0448 mg/L	0.04 mg/L	112	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.96 mg/L	10 mg/L	99.6	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00342 mg/L	0.004 mg/L	85.5	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----

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: 704058) - continued										
FJ2202949-002	BEA-B	Tellurium, dissolved	13494-80-9	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00388 mg/L	0.004 mg/L	97.0	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0394 mg/L	0.04 mg/L	98.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00406 mg/L	0.004 mg/L	102	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0978 mg/L	0.1 mg/L	97.8	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.384 mg/L	0.4 mg/L	95.9	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0441 mg/L	0.04 mg/L	110	70.0	130	----
Dissolved Metals (QCLot: 713015)										
FJ2202949-002	BEA-B	Mercury, dissolved	7439-97-6	E509-L	5.55 ng/L	5 ng/L	111	70.0	130	----
Speciated Metals (QCLot: 726346)										
FJ2202949-002	BEA-B	Methylmercury (as MeHg), total	22967-92-6	E536	0.00186 µg/L	0.0025 µg/L	74.6	60.0	140	----
Speciated Metals (QCLot: 728312)										
FJ2202978-001	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00178 µg/L	0.0025 µg/L	71.1	60.0	140	----
Speciated Metals (QCLot: 730526)										
FJ2202949-002	BEA-B	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00417 µg/L	0.0025 µg/L	83.5	60.0	140	----
Speciated Metals (QCLot: 756854)										
FJ2202949-002	BEA-B	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.355 mg/L	0.5 mg/L	71.1	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

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Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): Fort St. John Work Order Reference FJ2202949

Telephone : +1 250 261 5517

Project Manager: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identi (This descripti	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg (F)	Dissolved Metals by CRC ICPMS, Hardness (F)	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L) (F)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L) (F)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BEA-A	17Oct2022	17:00	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~BEA-B~~ BEA-B	17Oct2022	17:00	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~PD2-A~~			~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~PD2-B~~			~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~PINE~~			~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~PD1~~			~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	POUCE	17 OCT 22	11:45	Water	9	R	R	R	R	R	R	R	R	R	R			
	PD4	17Oct22	13:10	Water	9	R	R	R	R	R	R	R	R	R	R			
	KR	17Oct22	14:55	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~PD3~~			~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~Travel Blank~~			~~Water~~	~~5~~	R		R	R	R		R		R				

FJAE Shipping & Receiving: Call Out / Expedite / Priority / Air / # of Coolers / Ground / # of Carboys

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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
8.7	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
BM	17Oct 2022	18:45

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Oct 17/22	1850

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 3

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Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

Contact: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification (This description)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness (F)	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L) (F)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L) (F)					SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BEA-A	17Oct2022	17:00	Water	9	R	R	R	R	R	R	R	R	R	R							
	~~BEA-B~~ BEA-B	17Oct2022	17:00	Water	9	R	R	R	R	R	R	R	R	R	R							
	~~PD2-A~~			~~Water~~	~~9~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~							
	~~PD2-B~~			~~Water~~	~~9~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~							
	~~PINE~~			~~Water~~	~~9~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~							
	~~PD1~~			~~Water~~	~~9~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~							
	POUCE	17 OCT 22	11:45	Water	9	R	R	R	R	R	R	R	R	R	R							
	PD4	17Oct22	13:10	Water	9	R	R	R	R	R	R	R	R	R	R							
	KR	17Oct 22	14:55	Water	9	R	R	R	R	R	R	R	R	R	R							
	~~PD3~~			~~Water~~	~~9~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~							
	~~Travel Blank~~			~~Water~~	5	R		R	R	R		R		R								

Fort St. John Work Order Reference FJ2202949

Telephone : +1 250 261 5517

FJAE Shipping & Receiving
Call Out ___ Expedite ___ Priority
# of Coolers 1 Air ___ Ground
# of Carboys ___

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
8.7							9

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
BM	17Oct 2022	18:45

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Oct 17/22	1850

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	18/10/18	6:45P

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202956**	Page	: 1 of 8
Amendment	: **4**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day4	Issue Date	: 25-Aug-2023 17:57
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (6/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 6/6/2023. All analysis results are as per the previous report.
Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
RRV	Reported result verified by repeat analysis.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR3	MD	MD-FB	----	----
						Client sampling date / time	18-Oct-2022 08:20	18-Oct-2022 11:05	18-Oct-2022 08:20	----	----
							FJ2202956-001	FJ2202956-002	FJ2202956-003	--------	--------
							Result	Result	Result	----	----
Sample Preparation											
Dissolved Fe2 filtration location	----	EP541/VA		-	-		Field	Field	Field	----	----
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		74.7	188	<1.0	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	15.6	<1.0	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L		74.7	203	<1.0	----	----
Colour, true	----	E329/VA	A	5.0	CU		6.4	6.2	<5.0	----	----
Conductivity	----	E100/VA	A	2.0	µS/cm		174	424	<2.0	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA		0.50	mg/L		90.2	222	<0.50	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA		0.50	mg/L		92.5	216	<0.50	----	----
pH	----	E108/VA	A	0.10	pH units		8.14	8.54	5.58	----	----
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L		114	275	<10	----	----
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L		6.6	<3.0	<3.0	----	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L		0.0146	<0.0050	0.0116 RRV	----	----
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L		<0.50	0.69	<0.50	----	----
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L		0.032	0.094	<0.020	----	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L		0.109	0.082	<0.050	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L		0.0602	0.0053	<0.0050	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	----	----
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L		0.169	0.087	<0.030	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	----	----
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L		0.0093	0.0049	<0.0020	----	----
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L		<0.0020	0.0023	<0.0020	----	----
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L		4.16	4.69	<0.50	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L		12.3	31.5	<0.30	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/VA		0.0032	mg/L		0.0602	0.0053	<0.0051	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR3	MD	MD-FB	----	----
						Client sampling date / time	18-Oct-2022 08:20	18-Oct-2022 11:05	18-Oct-2022 08:20	----	----
							FJ2202956-001	FJ2202956-002	FJ2202956-003	--------	--------
							Result	Result	Result	----	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L		3.77	3.97	1.22 RRV	----	----
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L		2.83	3.21	1.27 RRV	----	----
Ion Balance											
Anion sum	----	EC101/VA		0.10	meq/L		1.75	4.74	<0.10	----	----
Cation sum	----	EC101/VA		0.10	meq/L		1.86	4.85	<0.10	----	----
Ion balance (APHA)	----	EC101/VA		0.010	%		3.05	1.15	<0.010	----	----
Total Metals											
Aluminum, total	7429-90-5	E420/VA	A	0.0030	mg/L		0.0809	0.0447	<0.0030	----	----
Antimony, total	7440-36-0	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	----	----
Arsenic, total	7440-38-2	E420/VA	A	0.00010	mg/L		0.00023	0.00030	<0.00010	----	----
Barium, total	7440-39-3	E420/VA	A	0.00010	mg/L		0.0325	0.197	<0.00010	----	----
Beryllium, total	7440-41-7	E420/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	----	----
Bismuth, total	7440-69-9	E420/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	----	----
Boron, total	7440-42-8	E420/VA	A	0.010	mg/L		<0.010	0.013	<0.010	----	----
Cadmium, total	7440-43-9	E420/VA	A	0.0000050	mg/L		0.0000169	0.0000111	<0.0000050	----	----
Calcium, total	7440-70-2	E420/VA	A	0.050	mg/L		27.1	60.3	<0.050	----	----
Cesium, total	7440-46-2	E420/VA	A	0.000010	mg/L		0.000016	<0.000010	<0.000010	----	----
Chromium, total	7440-47-3	E420/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	----	----
Cobalt, total	7440-48-4	E420/VA	A	0.00010	mg/L		<0.00010	0.00018	<0.00010	----	----
Copper, total	7440-50-8	E420/VA	A	0.00050	mg/L		0.00078	0.00058	<0.00050	----	----
Iron, total	7439-89-6	E420/VA	A	0.010	mg/L		0.115	0.183	<0.010	----	----
Lead, total	7439-92-1	E420/VA	A	0.000050	mg/L		0.000065	<0.000050	<0.000050	----	----
Lithium, total	7439-93-2	E420/VA	A	0.0010	mg/L		0.0011	0.0059	<0.0010	----	----
Magnesium, total	7439-95-4	E420/VA	A	0.0050	mg/L		6.04	16.0	<0.0050	----	----
Manganese, total	7439-96-5	E420/VA	A	0.00010	mg/L		0.00397	0.0342	<0.00010	----	----
Mercury, total	7439-97-6	E508-L/VA	A	0.50	ng/L		0.83	1.12	<0.50 DTC	----	----
Molybdenum, total	7439-98-7	E420/VA	A	0.000050	mg/L		0.000767	0.000929	<0.000050	----	----
Nickel, total	7440-02-0	E420/VA	A	0.00050	mg/L		0.00083	0.00130	<0.00050	----	----
Phosphorus, total	7723-14-0	E420/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	----	----
Potassium, total	7440-09-7	E420/VA	A	0.050	mg/L		0.445	1.14	<0.050	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	MD	MD-FB	----	----
					Client sampling date / time	18-Oct-2022 08:20	18-Oct-2022 11:05	18-Oct-2022 08:20	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2202956-001	FJ2202956-002	FJ2202956-003	--------	--------
						Result	Result	Result	----	----
Total Metals										
Rubidium, total	7440-17-7	E420/VA	A	0.00020	mg/L	0.00046	0.00045	<0.00020	----	----
Selenium, total	7782-49-2	E420/VA	A	0.000050	mg/L	0.000284	0.000202	<0.000050	----	----
Silicon, total	7440-21-3	E420/VA	A	0.10	mg/L	2.13	2.34	<0.10	----	----
Silver, total	7440-22-4	E420/VA	A	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----
Sodium, total	7440-23-5	E420/VA	A	0.050	mg/L	1.11	9.26	<0.050	----	----
Strontium, total	7440-24-6	E420/VA	A	0.00020	mg/L	0.104	0.177	<0.00020	----	----
Sulfur, total	7704-34-9	E420/VA	A	0.50	mg/L	4.72	11.8	<0.50	----	----
Tellurium, total	13494-80-9	E420/VA	A	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----
Thallium, total	7440-28-0	E420/VA	A	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----
Thorium, total	7440-29-1	E420/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Tin, total	7440-31-5	E420/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Titanium, total	7440-32-6	E420/VA	A	0.00030	mg/L	0.00157	0.00071	<0.00030	----	----
Tungsten, total	7440-33-7	E420/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Uranium, total	7440-61-1	E420/VA	A	0.000010	mg/L	0.000416	0.000713	<0.000010	----	----
Vanadium, total	7440-62-2	E420/VA	A	0.00050	mg/L	0.00060	<0.00050	<0.00050	----	----
Zinc, total	7440-66-6	E420/VA	A	0.0030	mg/L	<0.0030	<0.0030	<0.0030	----	----
Zirconium, total	7440-67-7	E420/VA	A	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	A	0.0010	mg/L	0.0044	0.0079	0.0033 RRV	----	----
Antimony, dissolved	7440-36-0	E421/VA	A	0.00010	mg/L	<0.00010	0.00011	<0.00010	----	----
Arsenic, dissolved	7440-38-2	E421/VA	A	0.00010	mg/L	0.00021	0.00022	<0.00010	----	----
Barium, dissolved	7440-39-3	E421/VA	A	0.00010	mg/L	0.0304	0.182	<0.00010	----	----
Beryllium, dissolved	7440-41-7	E421/VA	A	0.000020	mg/L	<0.000020	<0.000020	<0.000020	----	----
Bismuth, dissolved	7440-69-9	E421/VA	A	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----
Boron, dissolved	7440-42-8	E421/VA	A	0.010	mg/L	<0.010	0.013	<0.010	----	----
Cadmium, dissolved	7440-43-9	E421/VA	A	0.0000050	mg/L	0.0000056	0.0000062	0.0000057 RRV	----	----
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L	26.5	61.4	<0.050	----	----
Cesium, dissolved	7440-46-2	E421/VA	A	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----
Chromium, dissolved	7440-47-3	E421/VA	A	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Cobalt, dissolved	7440-48-4	E421/VA	A	0.00010	mg/L	<0.00010	0.00024	<0.00010	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	MD	MD-FB	----	----
					Client sampling date / time	18-Oct-2022 08:20	18-Oct-2022 11:05	18-Oct-2022 08:20	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2202956-001	FJ2202956-002	FJ2202956-003	--------	--------
						Result	Result	Result	----	----
Dissolved Metals										
Copper, dissolved	7440-50-8	E421/VA	A	0.00020	mg/L	0.00059	0.00041	<0.00020	----	----
Iron, dissolved	7439-89-6	E421/VA	A	0.010	mg/L	<0.010	<0.010	<0.010	----	----
Lead, dissolved	7439-92-1	E421/VA	A	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----
Lithium, dissolved	7439-93-2	E421/VA	A	0.0010	mg/L	0.0011	0.0064	<0.0010	----	----
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L	5.83	16.7	<0.0050	----	----
Manganese, dissolved	7439-96-5	E421/VA	A	0.00010	mg/L	0.00044	0.0320	0.00014 RRV	----	----
Mercury, dissolved	7439-97-6	E509-L/VA	A	0.50	ng/L	1.76	1.79	<0.50 DTC	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	A	0.000050	mg/L	0.000725	0.000922	<0.000050	----	----
Nickel, dissolved	7440-02-0	E421/VA	A	0.00050	mg/L	0.00065	0.00125	<0.00050	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	A	0.050	mg/L	<0.050	<0.050	<0.050	----	----
Potassium, dissolved	7440-09-7	E421/VA	A	0.050	mg/L	0.420	1.19	<0.050	----	----
Rubidium, dissolved	7440-17-7	E421/VA	A	0.00020	mg/L	0.00033	0.00032	<0.00020	----	----
Selenium, dissolved	7782-49-2	E421/VA	A	0.000050	mg/L	0.000283	0.000219	<0.000050	----	----
Silicon, dissolved	7440-21-3	E421/VA	A	0.050	mg/L	1.93	2.26	<0.050	----	----
Silver, dissolved	7440-22-4	E421/VA	A	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----
Sodium, dissolved	7440-23-5	E421/VA	A	0.050	mg/L	1.06	8.85	<0.050	----	----
Strontium, dissolved	7440-24-6	E421/VA	A	0.00020	mg/L	0.103	0.167	<0.00020	----	----
Sulfur, dissolved	7704-34-9	E421/VA	A	0.50	mg/L	4.23	11.2	<0.50	----	----
Tellurium, dissolved	13494-80-9	E421/VA	A	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----
Thallium, dissolved	7440-28-0	E421/VA	A	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----
Thorium, dissolved	7440-29-1	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Tin, dissolved	7440-31-5	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Titanium, dissolved	7440-32-6	E421/VA	A	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----
Tungsten, dissolved	7440-33-7	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----
Uranium, dissolved	7440-61-1	E421/VA	A	0.000010	mg/L	0.000424	0.000760	<0.000010	----	----
Vanadium, dissolved	7440-62-2	E421/VA	A	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----
Zinc, dissolved	7440-66-6	E421/VA	A	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----
Zirconium, dissolved	7440-67-7	E421/VA	A	0.00030	mg/L	<0.00030	<0.00030	<0.00030	----	----
Dissolved MeHg filtration location	----	EP537/VA		-	-	Field	Field	Field	----	----
Dissolved mercury filtration location	----	EP509-L/VA		-	-	Field	Field	Field	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR3	MD	MD-FB	----	----
					Client sampling date / time	18-Oct-2022 08:20	18-Oct-2022 11:05	18-Oct-2022 08:20	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2202956-001	FJ2202956-002	FJ2202956-003	--------	--------
						Result	Result	Result	----	----
Dissolved Metals										
Dissolved metals filtration location	----	EP421/VA		-	-	Field	Field	Field	----	----
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	<0.000000020	----	----
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	A	0.020	mg/L	<0.020	<0.020	<0.020	----	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	<0.000000020	----	----

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	: **FJ2202956**	Page	: 1 of 20
Amendment	: **4**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:57
C-O-C number	: 2022-Oct-MON8/9-Day4		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MD	E298	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR3	E298	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MD-FB	E298	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MD	E235.Cl	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MD-FB	E235.Cl	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR3	E235.Cl	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD	E378-U	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR3	E378-U	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MD-FB	E378-U	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	4 days	× EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD	E235.F	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MD-FB	E235.F	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR3	E235.F	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD	E235.NO3-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MD-FB	E235.NO3-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE PR3	E235.NO3-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD	E235.NO2-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MD-FB	E235.NO2-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR3	E235.NO2-L	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MD	E392	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MD-FB	E392	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR3	E392	18-Oct-2022	----	----	----		24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MD	E235.SO4	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MD-FB	E235.SO4	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR3	E235.SO4	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	21-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD	E375-T	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MD-FB	E375-T	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR3	E375-T	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MD	E366	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR3	E366	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	24-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MD-FB	E366	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MD	E372-U	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR3	E372-U	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MD-FB	E372-U	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	23-Oct-2022	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) MD	E509-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) MD-FB	E509-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR3	E509-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MD	E421	18-Oct-2022	22-Oct-2022	180 days	4 days	✓	22-Oct-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MD-FB	E421	18-Oct-2022	22-Oct-2022	180 days	4 days	✓	22-Oct-2022	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) PR3	E421	18-Oct-2022	22-Oct-2022	180 days	4 days	✓	22-Oct-2022	180 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MD	E358-L	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	22-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MD-FB	E358-L	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	22-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR3	E358-L	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	22-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MD	E355-L	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR3	E355-L	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MD-FB	E355-L	18-Oct-2022	22-Oct-2022	28 days	4 days	✓	22-Oct-2022	28 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MD	E290	18-Oct-2022	21-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MD-FB	E290	18-Oct-2022	21-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR3	E290	18-Oct-2022	21-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE MD	E329	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE MD-FB	E329	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	4 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PR3	E329	18-Oct-2022	21-Oct-2022	3 days	3 days	✓	21-Oct-2022	3 days	4 days	× EHT
Physical Tests : Conductivity in Water										
HDPE MD	E100	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MD-FB	E100	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PR3	E100	18-Oct-2022	21-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE MD	E108	18-Oct-2022	21-Oct-2022	0.25 hrs	79 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	94 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR3	E108	18-Oct-2022	21-Oct-2022	0.25 hrs	79 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	97 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MD-FB	E108	18-Oct-2022	21-Oct-2022	0.25 hrs	82 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	97 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE MD	E162	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MD-FB	E162	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 PR3	E162	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD	E160	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE MD-FB	E160	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR3	E160	18-Oct-2022	----	----	----		22-Oct-2022	7 days	4 days	✓
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) MD	E541	18-Oct-2022	24-Nov-2022	7 days	37 days	× EHT	24-Nov-2022	7 days	37 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) MD-FB	E541	18-Oct-2022	24-Nov-2022	7 days	37 days	× EHT	24-Nov-2022	7 days	37 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PR3	E541	18-Oct-2022	24-Nov-2022	7 days	37 days	× EHT	24-Nov-2022	7 days	37 days	× EHT
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) MD	E537	18-Oct-2022	04-Nov-2022	180 days	17 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) MD-FB	E537	18-Oct-2022	04-Nov-2022	180 days	17 days	✓	10-Nov-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PR3	E537	18-Oct-2022	04-Nov-2022	180 days	17 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) MD	E536	18-Oct-2022	03-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	20 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) MD-FB	E536	18-Oct-2022	03-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	20 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR3	E536	18-Oct-2022	03-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	20 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) MD	E508-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) MD-FB	E508-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR3	E508-L	18-Oct-2022	25-Oct-2022	28 days	7 days	✓	25-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MD	E420	18-Oct-2022	21-Oct-2022	180 days	3 days	✓	22-Oct-2022	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MD-FB	E420	18-Oct-2022	21-Oct-2022	180 days	3 days	✓	22-Oct-2022	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
PR3	E420	18-Oct-2022	21-Oct-2022	180 days	3 days	✓	22-Oct-2022	180 days	4 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	708319	3	30	10.0	5.0	✓
Ammonia by Fluorescence	E298	708387	2	29	6.9	5.0	✓
Chloride in Water by IC	E235.Cl	708324	3	21	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	708335	3	11	27.2	5.0	✓
Conductivity in Water	E100	708321	3	28	10.7	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	708361	1	13	7.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	709304	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	708334	3	19	15.7	5.0	✓
Fluoride in Water by IC	E235.F	708323	3	17	17.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	708325	3	34	8.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	708326	3	36	8.3	5.0	✓
pH by Meter	E108	708318	3	25	12.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	708327	3	17	17.6	5.0	✓
TDS by Gravimetry	E162	709337	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709303	1	6	16.6	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	708233	1	13	7.6	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	708385	2	4	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	708391	2	19	10.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	708392	2	19	10.5	5.0	✓
TSS by Gravimetry	E160	709333	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	708319	3	30	10.0	5.0	✓
Ammonia by Fluorescence	E298	708387	2	29	6.9	5.0	✓
Chloride in Water by IC	E235.Cl	708324	3	21	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	708335	3	11	27.2	5.0	✓
Conductivity in Water	E100	708321	3	28	10.7	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	708361	1	13	7.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	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							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	709304	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	708334	3	19	15.7	5.0	✓
Fluoride in Water by IC	E235.F	708323	3	17	17.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	708325	3	34	8.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	708326	3	36	8.3	5.0	✓
pH by Meter	E108	708318	3	25	12.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	708327	3	17	17.6	5.0	✓
TDS by Gravimetry	E162	709337	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709303	1	6	16.6	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	708233	1	13	7.6	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	708385	2	4	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	708391	2	19	10.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	708392	2	19	10.5	5.0	✓
TSS by Gravimetry	E160	709333	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	708319	3	30	10.0	5.0	✓
Ammonia by Fluorescence	E298	708387	2	29	6.9	5.0	✓
Chloride in Water by IC	E235.Cl	708324	3	21	14.2	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	708335	3	11	27.2	5.0	✓
Conductivity in Water	E100	708321	3	28	10.7	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	708361	1	13	7.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	709304	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	708334	3	19	15.7	5.0	✓
Fluoride in Water by IC	E235.F	708323	3	17	17.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	708325	3	34	8.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	708326	3	36	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	708327	3	17	17.6	5.0	✓
TDS by Gravimetry	E162	709337	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709303	1	6	16.6	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	708233	1	13	7.6	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Total Nitrogen by Colourimetry	E366	708385	2	4	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	708391	2	19	10.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	708392	2	19	10.5	5.0	✓
TSS by Gravimetry	E160	709333	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	708387	2	29	6.9	5.0	✓
Chloride in Water by IC	E235.Cl	708324	2	21	9.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	713015	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	708361	1	13	7.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	709304	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	708334	2	19	10.5	5.0	✓
Fluoride in Water by IC	E235.F	708323	2	17	11.7	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	708325	3	34	8.8	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	708326	3	36	8.3	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	708327	2	17	11.7	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709303	1	6	16.6	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	712785	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	708233	1	13	7.6	5.0	✓
Total Methylmercury in Water by GCAFS	E536	726346	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	708385	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	708391	2	19	10.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	708392	2	19	10.5	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
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.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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 (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.

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QUALITY CONTROL REPORT

Work Order	: **FJ2202956**	Page	: 1 of 25
Amendment	: **4**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.02	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day4	Issue Date	: 25-Aug-2023 17:57
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 708318)											
YL2201850-001	Anonymous	pH	----	E108	0.10	pH units	7.85	7.87	0.254%	4%	----
Physical Tests (QC Lot: 708319)											
YL2201850-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	113	112	0.623%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	113	112	0.623%	20%	----
Physical Tests (QC Lot: 708321)											
YL2201850-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	16400	16100	1.60%	10%	----
Physical Tests (QC Lot: 708335)											
FJ2202956-001	PR3	Colour, true	----	E329	5.0	CU	6.4	6.5	0.1	Diff <2x LOR	----
Physical Tests (QC Lot: 708680)											
FJ2202956-002	MD	Conductivity	----	E100	2.0	µS/cm	424	421	0.710%	10%	----
Physical Tests (QC Lot: 708681)											
FJ2202956-002	MD	pH	----	E108	0.10	pH units	8.54	8.54	0.00%	4%	----
Physical Tests (QC Lot: 708682)											
FJ2202956-002	MD	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	188	188	0.00%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	15.6	15.2	2.60%	20%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	203	203	0.197%	20%	----
Physical Tests (QC Lot: 708691)											
FJ2202956-002	MD	Colour, true	----	E329	5.0	CU	6.2	6.9	0.7	Diff <2x LOR	----
Physical Tests (QC Lot: 708828)											
FJ2202956-003	MD-FB	Conductivity	----	E100	2.0	µS/cm	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 708829)											
FJ2202956-003	MD-FB	pH	----	E108	0.10	pH units	5.58	5.40	3.28%	4%	----
Physical Tests (QC Lot: 708830)											
FJ2202956-003	MD-FB	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	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*
Physical Tests (QC Lot: 708837)											
FJ2202956-003	MD-FB	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 709333)											
FJ2202956-001	PR3	Solids, total suspended [TSS]	----	E160	3.0	mg/L	6.6	6.2	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 709337)											
FJ2202956-001	PR3	Solids, total dissolved [TDS]	----	E162	13	mg/L	114	110	4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708323)											
VA22C5356-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	<100 µg/L	<0.100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708324)											
VA22C5356-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	49900 µg/L	50.2	0.561%	20%	----
Anions and Nutrients (QC Lot: 708325)											
VA22C5356-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	21700 µg/L	21.8	0.711%	20%	----
Anions and Nutrients (QC Lot: 708326)											
VA22C5356-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	7.9 µg/L	0.0078	0.00006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708327)											
VA22C5356-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	7060 µg/L	7.20	0.14	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708334)											
FJ2202956-001	PR3	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708385)											
FJ2202956-001	PR3	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.169	0.166	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708387)											
FJ2202956-001	PR3	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0146	0.0150	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708392)											
FJ2202956-001	PR3	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0093	0.0091	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708683)											
VA22C4889-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	46.7	46.6	0.0663%	20%	----
Anions and Nutrients (QC Lot: 708684)											
VA22C4889-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0745	0.0845	12.6%	20%	----
Anions and Nutrients (QC Lot: 708685)											
VA22C4889-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0038	0.0034	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708686)											
VA22C4889-002	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.096	0.096	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708687)											
VA22C4889-002	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	47.8	47.8	0.0420%	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*
Anions and Nutrients (QC Lot: 708690)											
FJ2202956-002	MD	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708831)											
FJ2202956-003	MD-FB	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	<0.30	<0.30	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708832)											
FJ2202956-003	MD-FB	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708833)											
FJ2202956-003	MD-FB	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708834)											
FJ2202956-003	MD-FB	Fluoride	16984-48-8	E235.F	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708835)											
FJ2202956-003	MD-FB	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 708836)											
FJ2202956-003	MD-FB	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709303)											
FJ2202956-001	PR3	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709306)											
FJ2202956-003	MD-FB	Nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709307)											
FJ2202956-003	MD-FB	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709308)											
FJ2202956-003	MD-FB	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0116	0.0110	0.0006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712325)											
FJ2202956-001	PR3	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.16	4.16	0.002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 708391)											
FJ2202956-001	PR3	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.83	3.13	0.30	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 709304)											
FJ2202956-001	PR3	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.77	3.62	0.15	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 709305)											
FJ2202956-003	MD-FB	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	1.27	1.08	0.19	Diff <2x LOR	----
Total Metals (QC Lot: 708233)											
YL2201853-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.174	0.192	9.70%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00026	0.00026	0.000002	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: 708233) - continued											
YL2201853-001	Anonymous	Barium, total	7440-39-3	E420	0.00010	mg/L	0.00361	0.00394	8.53%	20%	----
		Beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.018	0.019	0.0008	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	7.85	8.14	3.62%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	0.00053	0.00003	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	0.00199	0.00205	0.00006	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.265	0.288	8.44%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000071	0.000078	0.000006	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0029	0.0030	0.0001	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	6.21	6.01	3.39%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0121	0.0134	9.85%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000196	0.000204	0.000008	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00087	0.00078	0.00009	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	2.06	2.05	0.283%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00164	0.00164	0.000003	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000056	0.000057	0.0000005	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.70	1.75	2.81%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	28.4	29.7	4.67%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0382	0.0371	2.85%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.02	0.83	0.19	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	0.00543	0.00649	17.9%	20%	----
		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	0.000045	0.000049	0.000004	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	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: 708233) - continued											
YL2201853-001	Anonymous	Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 712785)											
CG2214494-007	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 708361)											
FJ2202956-001	PR3	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0044	0.0045	0.0002	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00021	0.00016	0.00005	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0304	0.0308	1.31%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000056	0.0000087	0.0000031	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	26.5	26.6	0.368%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00059	0.00058	0.000006	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0011	0.0011	0.00001	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.83	5.84	0.141%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00044	0.00044	0.000004	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000725	0.000770	6.01%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00065	0.00065	0.000003	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.420	0.419	0.0008	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00033	0.00030	0.00002	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000283	0.000252	0.000030	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.93	1.91	1.12%	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	1.06	1.05	0.806%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.103	0.102	0.385%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4.23	4.09	0.14	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 708361) - continued											
FJ2202956-001	PR3	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	0.000424	0.000423	0.141%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 713015)											
FJ2202949-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	0.50	ng/L	2.12	2.73	0.60	Diff <2x LOR	----
Speciated Metals (QC Lot: 726346)											
FJ2202949-001	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	0.000000074 mg/L	0.000095	0.000021	Diff <2x LOR	----
Speciated Metals (QC Lot: 730526)											
FJ2202949-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000000125 mg/L	0.000149	17.0%	30%	----
Speciated Metals (QC Lot: 756854)											
FJ2202949-001	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.046	0.046	0.0002	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: 708319)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 708321)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 708335)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 708680)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 708682)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 708691)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 708828)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 708830)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 708837)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 709333)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 709337)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 708323)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 708324)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 708325)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 708326)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 708327)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 708334)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 708385)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 708387)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 708392)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 708683)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 708684)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 708685)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 708686)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 708687)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 708690)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 708831)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 708832)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 708833)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 708834)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 708835)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 708836)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 709303)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 709306)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 709307)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 709308)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 712325)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 708391)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 709304)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 709305)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 708233)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 708233) - continued						
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 712785)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 708361)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 708361) - continued						
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 713015)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 726346)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Speciated Metals (QCLot: 730526)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 756854)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 708318)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 708319)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 708321)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	98.5	90.0	110	----
Physical Tests (QCLot: 708335)									
Colour, true	----	E329	5	CU	100 CU	101	85.0	115	----
Physical Tests (QCLot: 708680)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.6	90.0	110	----
Physical Tests (QCLot: 708681)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 708682)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	107	85.0	115	----
Physical Tests (QCLot: 708691)									
Colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 708828)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 708829)									
pH	----	E108	----	pH units	7 pH units	99.7	98.0	102	----
Physical Tests (QCLot: 708830)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	106	85.0	115	----
Physical Tests (QCLot: 708837)									
Colour, true	----	E329	5	CU	100 CU	101	85.0	115	----
Physical Tests (QCLot: 709333)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	87.0	85.0	115	----
Physical Tests (QCLot: 709337)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 708323)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 708324)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 708325)									
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: 708326)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 708327)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 708334)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	102	80.0	120	----
Anions and Nutrients (QCLot: 708385)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 708387)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.7	85.0	115	----
Anions and Nutrients (QCLot: 708392)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	93.3	80.0	120	----
Anions and Nutrients (QCLot: 708683)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 708684)									
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: 708685)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 708686)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 708687)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 708690)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 708831)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 708832)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 708833)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.2	90.0	110	----
Anions and Nutrients (QCLot: 708834)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 708835)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.3	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 708836)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	99.2	80.0	120	----
Anions and Nutrients (QCLot: 709303)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	92.1	80.0	120	----
Anions and Nutrients (QCLot: 709306)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.0	75.0	125	----
Anions and Nutrients (QCLot: 709307)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.0	80.0	120	----
Anions and Nutrients (QCLot: 709308)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 712325)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	104	85.0	115	----
Organic / Inorganic Carbon (QCLot: 708391)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 709304)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.9	80.0	120	----
Organic / Inorganic Carbon (QCLot: 709305)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 708233)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	103	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.6	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	99.5	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	93.8	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	103	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	97.6	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.0	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	107	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.4	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	90.8	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 708233) - continued									
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	99.8	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.5	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	95.2	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	107	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	104	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	94.2	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	116	80.0	120	----
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	104	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	94.8	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	97.1	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	94.2	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	105	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	94.5	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Total Metals (QCLot: 712785)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	112	80.0	120	----
Dissolved Metals (QCLot: 708361)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	92.8	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	106	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 708361) - continued									
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	105	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.1	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	97.8	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	107	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	98.3	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	96.4	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	97.8	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	103	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	97.4	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	100	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	105	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.0	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	102	80.0	120	----
Speciated Metals (QCLot: 726346)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	85.7	70.0	130	----
Speciated Metals (QCLot: 730526)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	79.4	70.0	130	----
Speciated Metals (QCLot: 756854)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Speciated Metals (QCLot: 756854) - continued									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	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: 708323)										
YL2201843-001	Anonymous	Fluoride	16984-48-8	E235.F	20.4 mg/L	20 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 708324)										
YL2201843-001	Anonymous	Chloride	16887-00-6	E235.Cl	2050 mg/L	2000 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 708325)										
YL2201843-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	51.4 mg/L	50 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 708326)										
YL2201843-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	9.91 mg/L	10 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 708327)										
YL2201843-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	2040 mg/L	2000 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 708334)										
VA22C5356-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	0.03 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 708385)										
FJ2202956-002	MD	Nitrogen, total	7727-37-9	E366	0.400 mg/L	0.4 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 708387)										
FJ2202956-002	MD	Ammonia, total (as N)	7664-41-7	E298	0.104 mg/L	0.1 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 708392)										
FJ2202956-002	MD	Phosphorus, total	7723-14-0	E372-U	0.0500 mg/L	0.05 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 708683)										
VA22C4889-003	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	105 mg/L	100 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 708684)										
VA22C4889-003	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.63 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 708685)										
VA22C4889-003	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.506 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 708686)										
VA22C4889-003	Anonymous	Fluoride	16984-48-8	E235.F	1.05 mg/L	1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 708687)										
VA22C4889-003	Anonymous	Chloride	16887-00-6	E235.Cl	105 mg/L	100 mg/L	105	75.0	125	----

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: 708832)										
VA22C4152-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.66 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 708833)										
VA22C4152-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.522 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 708836)										
VA22C4152-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0290 mg/L	0.03 mg/L	96.5	70.0	130	----
Anions and Nutrients (QCLot: 709303)										
FJ2202956-002	MD	Phosphorus, total dissolved	7723-14-0	E375-T	0.0492 mg/L	0.05 mg/L	98.3	70.0	130	----
Anions and Nutrients (QCLot: 709307)										
WR2201327-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0499 mg/L	0.05 mg/L	99.9	70.0	130	----
Anions and Nutrients (QCLot: 709308)										
WR2201327-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.101 mg/L	0.1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 712325)										
FJ2202956-002	MD	Silicate (as SiO2)	7631-86-9	E392	10.4 mg/L	10 mg/L	104	75.0	125	----
Organic / Inorganic Carbon (QCLot: 708391)										
FJ2202956-002	MD	Carbon, total organic [TOC]	----	E355-L	5.56 mg/L	5 mg/L	111	70.0	130	----
Organic / Inorganic Carbon (QCLot: 709304)										
FJ2202956-002	MD	Carbon, dissolved organic [DOC]	----	E358-L	4.54 mg/L	5 mg/L	90.9	70.0	130	----
Organic / Inorganic Carbon (QCLot: 709305)										
WR2201327-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	4.55 mg/L	5 mg/L	91.0	70.0	130	----
Total Metals (QCLot: 708233)										
FJ2202956-002	MD	Aluminum, total	7429-90-5	E420	0.197 mg/L	0.2 mg/L	98.4	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00891 mg/L	0.01 mg/L	89.1	70.0	130	----
		Boron, total	7440-42-8	E420	0.096 mg/L	0.1 mg/L	96.3	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00404 mg/L	0.004 mg/L	101	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00972 mg/L	0.01 mg/L	97.2	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 708233) - continued										
FJ2202956-002	MD	Copper, total	7440-50-8	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130	----
		Iron, total	7439-89-6	E420	1.98 mg/L	2 mg/L	99.0	70.0	130	----
		Lead, total	7439-92-1	E420	0.0183 mg/L	0.02 mg/L	91.3	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0935 mg/L	0.1 mg/L	93.5	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0372 mg/L	0.04 mg/L	93.0	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.4 mg/L	10 mg/L	104	70.0	130	----
		Potassium, total	7440-09-7	E420	3.88 mg/L	4 mg/L	96.9	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0416 mg/L	0.04 mg/L	104	70.0	130	----
		Silicon, total	7440-21-3	E420	9.62 mg/L	10 mg/L	96.2	70.0	130	----
		Silver, total	7440-22-4	E420	0.00405 mg/L	0.004 mg/L	101	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	22.3 mg/L	20 mg/L	111	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00368 mg/L	0.004 mg/L	92.0	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		Tin, total	7440-31-5	E420	0.0195 mg/L	0.02 mg/L	97.6	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	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00388 mg/L	0.004 mg/L	97.1	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.104 mg/L	0.1 mg/L	104	70.0	130	----
		Zinc, total	7440-66-6	E420	0.371 mg/L	0.4 mg/L	92.8	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0434 mg/L	0.04 mg/L	108	70.0	130	----
Total Metals (QCLot: 712785)										
CG2214545-001	Anonymous	Mercury, total	7439-97-6	E508-L	6.41 ng/L	5 ng/L	128	70.0	130	----
Dissolved Metals (QCLot: 708361)										
FJ2202956-002	MD	Aluminum, dissolved	7429-90-5	E421	0.196 mg/L	0.2 mg/L	97.9	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0404 mg/L	0.04 mg/L	101	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 708361) - continued										
FJ2202956-002	MD	Bismuth, dissolved	7440-69-9	E421	0.00925 mg/L	0.01 mg/L	92.5	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.089 mg/L	0.1 mg/L	88.7	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0187 mg/L	0.02 mg/L	93.5	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.98 mg/L	2 mg/L	98.8	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0982 mg/L	0.1 mg/L	98.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.98 mg/L	10 mg/L	99.8	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.91 mg/L	4 mg/L	97.8	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0446 mg/L	0.04 mg/L	111	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.61 mg/L	10 mg/L	96.1	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00427 mg/L	0.004 mg/L	107	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	20.3 mg/L	20 mg/L	101	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00392 mg/L	0.004 mg/L	97.9	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00403 mg/L	0.004 mg/L	101	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.402 mg/L	0.4 mg/L	101	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0414 mg/L	0.04 mg/L	104	70.0	130	----
Dissolved Metals (QCLot: 713015)										

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: 713015) - continued										
FJ2202949-002	Anonymous	Mercury, dissolved	7439-97-6	E509-L	5.55 ng/L	5 ng/L	111	70.0	130	----
Speciated Metals (QCLot: 726346)										
FJ2202949-002	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00186 µg/L	0.0025 µg/L	74.6	60.0	140	----
Speciated Metals (QCLot: 730526)										
FJ2202949-002	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00417 µg/L	0.0025 µg/L	83.5	60.0	140	----
Speciated Metals (QCLot: 756854)										
FJ2202949-002	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.355 mg/L	0.5 mg/L	71.1	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: skennedy@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Surface water MON8/9- with metals	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.02	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sean Zhang	Sampler: Pat Beaupre

Analysis Request

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: Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	F/P: DOC, Total dissolved P	P: NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	F: Total Methyl Hg by GCAFS (0.00000002 mg/L)	F: Dissolved Methyl Hg by GCAFS (0.00000002 mg/L)	F: Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	F: Dissolved Metals by CRC ICPMS, Hardness	F: Total Mercury in Water, CVAFS (Low Level 0.0000005 mg/L)	F: Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD5~~ PR2.81 PR3	18 oct 22	08:20	Water	9	R	R	R	R	R	R	R	R	R	R			
	MD	18 oct 22	11:05	Water	9	R	R	R	R	R	R	R	R	R	R			
	MD-FB	18 oct 22	08:20	Water	9	R	R	R	R	R	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2202956

Telephone : +1 250 261 5517

RJAE 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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	gmann@azimuthgroup.ca; imcivor@azimuthgroup.ca; csuzanne@ecofishresearch.com; kganshorn@ecofishresearch.com

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			
7.2				6.2			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Oct 18, 2022	Time:	Received by:	Date: 10-18-22	Time: 4:30	Received by: AB	Date: OCT 19 2022	Time: 8:40 AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202978**	Page	: 1 of 9
Amendment	: **5**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 19-Oct-2022 11:29
PO	: 1200-25.03.02	Date Analysis Commenced	: 20-Oct-2022
C-O-C number	: 2022-OCT-MON8/9-DAY 1	Issue Date	: 25-Aug-2023 17:57
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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
Anthony Calero	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Metals, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Elke Tabora		Inorganics, Calgary, Alberta
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Louis Wagner	Technical Specialist	Administration, Calgary, Alberta
Louis Wagner	Technical Specialist	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Millicent Brentnall	Laboratory Analyst	Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta
Ruifang Zheng	Analyst	Inorganics, Calgary, Alberta
Sara Niroomand		Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia
Vladka Stamenova	Analyst	Inorganics, Calgary, Alberta

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/L	micrograms per litre
µg/sample	micrograms per sample
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
L	litres
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	CG ALS Environmental - Calgary	2559 29th Street NE, Calgary, AB
B	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (10/5/2023): This report has been amended and re-released to allow the reporting of additional analytical data. Added ug/L calculation for Chlorophyll-a.

Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
						Client sampling date / time	19-Oct-2022 07:50	19-Oct-2022 08:30	19-Oct-2022 10:25	19-Oct-2022 09:55	19-Oct-2022 00:00
							FJ2202978-001	FJ2202978-002	FJ2202978-003	FJ2202978-004	FJ2202978-005
							Result	Result	Result	Result	Result
Sample Preparation											
Dissolved Fe2 filtration location	----	EP541/VA		-	-		Field	Field	Field	Field	----
Volume filtered	----	EF870B/CG		0.001	L		0.200	0.200	0.200	0.200	0.200
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		74.8	76.1	83.0	81.0	----
Alkalinity, carbonate (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290/CG	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, total (as CaCO3)	----	E290/CG	A	1.0	mg/L		74.8	76.1	83.0	81.0	----
Colour, true	----	E329/CG	A	5.0	CU		7.0	7.3	7.7	10.9	----
Conductivity	----	E100/CG	A	2.0	µS/cm		159	159	163	163	----
Hardness (as CaCO3), dissolved	----	EC100/CG		0.50	mg/L		92.2	89.8	92.8	90.2	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/CG		0.50	mg/L		94.4	94.4	96.3	94.2	----
pH	----	E108/CG	A	0.10	pH units		8.07	8.00	7.97	7.97	----
Solids, total dissolved [TDS]	----	E162/CG	A	10	mg/L		110	108	96	92	----
Solids, total suspended [TSS]	----	E160/CG	A	3.0	mg/L		<3.0	<3.0	<3.0	<3.0	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/CG	A	0.0050	mg/L		<0.0050	<0.0050	0.0073	<0.0050	----
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	----
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L		0.034	0.032	0.034	0.033	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L		0.084	0.094	0.108	0.086	----
Nitrate (as N)	14797-55-8	E235.NO3-L/CG	A	0.0050	mg/L		0.0688	0.0615	0.0667	0.0654	----
Nitrite (as N)	14797-65-0	E235.NO2-L/CG	A	0.0010	mg/L		0.0017	0.0010	<0.0010	<0.0010	----
Nitrogen, total	7727-37-9	E366/VA	B	0.030	mg/L		0.155	0.157	0.175	0.151	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Phosphorus, total	7723-14-0	E372-U/CG	A	0.0020	mg/L		0.0038	0.0036	0.0119	0.0039	----
Phosphorus, total dissolved	7723-14-0	E375-T/CG	A	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392/VA	B	0.50	mg/L		4.16	4.17	4.24	4.26	----
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L		11.9	11.6	12.0	12.0	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
						Client sampling date / time	19-Oct-2022 07:50	19-Oct-2022 08:30	19-Oct-2022 10:25	19-Oct-2022 09:55	19-Oct-2022 00:00
							FJ2202978-001	FJ2202978-002	FJ2202978-003	FJ2202978-004	FJ2202978-005
							Result	Result	Result	Result	Result
Anions and Nutrients											
Nitrate + Nitrite (as N)	----	EC235.N+N/CG		0.0032	mg/L		0.0705	0.0625	0.0667	0.0654	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/CG	A	0.50	mg/L		2.69	2.30	3.07	2.58	----
Carbon, total organic [TOC]	----	E355-L/CG	A	0.50	mg/L		2.61	2.74	3.23	2.44	----
Ion Balance											
Anion sum	----	EC101/CG		0.10	meq/L		1.75	1.77	1.92	1.87	----
Cation sum	----	EC101/CG		0.10	meq/L		1.90	1.85	1.91	1.86	----
Ion balance (APHA)	----	EC101/CG		0.010	%		4.11	2.21	0.261	0.268	----
Total Metals											
Aluminum, total	7429-90-5	E420/CG	A	0.0030	mg/L		0.0166	0.0153	0.0212	0.0205	----
Antimony, total	7440-36-0	E420/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Arsenic, total	7440-38-2	E420/CG	A	0.00010	mg/L		0.00021	0.00019	0.00022	0.00020	----
Barium, total	7440-39-3	E420/CG	A	0.00010	mg/L		0.0291	0.0280	0.0298	0.0290	----
Beryllium, total	7440-41-7	E420/CG	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
Bismuth, total	7440-69-9	E420/CG	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Boron, total	7440-42-8	E420/CG	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Cadmium, total	7440-43-9	E420/CG	A	0.0000050	mg/L		0.0000110	0.0000110	0.0000166	0.0000186	----
Calcium, total	7440-70-2	E420/CG	A	0.050	mg/L		27.8	27.6	28.2	27.8	----
Cesium, total	7440-46-2	E420/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Chromium, total	7440-47-3	E420/CG	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Cobalt, total	7440-48-4	E420/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Copper, total	7440-50-8	E420/CG	A	0.00050	mg/L		0.00067	0.00069	0.00077	0.00066	----
Iron, total	7439-89-6	E420/CG	A	0.010	mg/L		0.014	0.014	0.023	0.023	----
Lead, total	7439-92-1	E420/CG	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Lithium, total	7439-93-2	E420/CG	A	0.0010	mg/L		0.0013	0.0013	0.0014	0.0013	----
Magnesium, total	7439-95-4	E420/CG	A	0.0050	mg/L		6.08	6.20	6.29	6.02	----
Manganese, total	7439-96-5	E420/CG	A	0.00010	mg/L		0.00132	0.00127	0.00188	0.00206	----
Mercury, total	7439-97-6	E508-L/VA	B	0.50	ng/L		0.51	<0.50	<0.50	0.52	----
Molybdenum, total	7439-98-7	E420/CG	A	0.000050	mg/L		0.000808	0.000767	0.000765	0.000717	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
						Client sampling date / time	19-Oct-2022 07:50	19-Oct-2022 08:30	19-Oct-2022 10:25	19-Oct-2022 09:55	19-Oct-2022 00:00
							FJ2202978-001	FJ2202978-002	FJ2202978-003	FJ2202978-004	FJ2202978-005
							Result	Result	Result	Result	Result
Total Metals											
Nickel, total	7440-02-0	E420/CG	A	0.00050	mg/L		0.00072	0.00069	0.00075	0.00072	----
Phosphorus, total	7723-14-0	E420/CG	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Potassium, total	7440-09-7	E420/CG	A	0.050	mg/L		0.435	0.443	0.442	0.436	----
Rubidium, total	7440-17-7	E420/CG	A	0.00020	mg/L		0.00034	0.00029	0.00030	0.00029	----
Selenium, total	7782-49-2	E420/CG	A	0.000050	mg/L		0.000241	0.000241	0.000211	0.000251	----
Silicon, total	7440-21-3	E420/CG	A	0.10	mg/L		2.07	2.06	2.15	2.10	----
Silver, total	7440-22-4	E420/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, total	7440-23-5	E420/CG	A	0.050	mg/L		1.01	1.02	1.04	1.01	----
Strontium, total	7440-24-6	E420/CG	A	0.00020	mg/L		0.106	0.104	0.109	0.106	----
Sulfur, total	7704-34-9	E420/CG	A	0.50	mg/L		4.67	4.54	4.71	4.73	----
Tellurium, total	13494-80-9	E420/CG	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Thallium, total	7440-28-0	E420/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Thorium, total	7440-29-1	E420/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Tin, total	7440-31-5	E420/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Titanium, total	7440-32-6	E420/CG	A	0.00030	mg/L		0.00046	<0.00030	0.00066	0.00048	----
Tungsten, total	7440-33-7	E420/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Uranium, total	7440-61-1	E420/CG	A	0.000010	mg/L		0.000412	0.000401	0.000420	0.000400	----
Vanadium, total	7440-62-2	E420/CG	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Zinc, total	7440-66-6	E420/CG	A	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	----
Zirconium, total	7440-67-7	E420/CG	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/CG	A	0.0010	mg/L		0.0044	0.0047	0.0044	0.0043	----
Antimony, dissolved	7440-36-0	E421/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Arsenic, dissolved	7440-38-2	E421/CG	A	0.00010	mg/L		0.00019	0.00018	0.00019	0.00020	----
Barium, dissolved	7440-39-3	E421/CG	A	0.00010	mg/L		0.0285	0.0275	0.0290	0.0292	----
Beryllium, dissolved	7440-41-7	E421/CG	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
Bismuth, dissolved	7440-69-9	E421/CG	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Boron, dissolved	7440-42-8	E421/CG	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Cadmium, dissolved	7440-43-9	E421/CG	A	0.0000050	mg/L		0.0000080	0.0000071	0.0000070	0.0000077	----
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L		26.6	25.9	26.8	26.1	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
						Client sampling date / time	19-Oct-2022 07:50	19-Oct-2022 08:30	19-Oct-2022 10:25	19-Oct-2022 09:55	19-Oct-2022 00:00
							FJ2202978-001	FJ2202978-002	FJ2202978-003	FJ2202978-004	FJ2202978-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Cesium, dissolved	7440-46-2	E421/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Chromium, dissolved	7440-47-3	E421/CG	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Cobalt, dissolved	7440-48-4	E421/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Copper, dissolved	7440-50-8	E421/CG	A	0.00020	mg/L		0.00060	0.00057	0.00059	0.00061	----
Iron, dissolved	7439-89-6	E421/CG	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Lead, dissolved	7439-92-1	E421/CG	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Lithium, dissolved	7439-93-2	E421/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L		6.26	6.10	6.28	6.09	----
Manganese, dissolved	7439-96-5	E421/CG	A	0.00010	mg/L		0.00021	0.00018	0.00051	0.00051	----
Mercury, dissolved	7439-97-6	E509-L/VA	B	0.50	ng/L		<0.50	<0.50	<0.50	<0.50	----
Molybdenum, dissolved	7439-98-7	E421/CG	A	0.000050	mg/L		0.000709	0.000708	0.000728	0.000702	----
Nickel, dissolved	7440-02-0	E421/CG	A	0.00050	mg/L		0.00068	0.00061	0.00065	0.00062	----
Phosphorus, dissolved	7723-14-0	E421/CG	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Potassium, dissolved	7440-09-7	E421/CG	A	0.050	mg/L		0.378	0.370	0.380	0.372	----
Rubidium, dissolved	7440-17-7	E421/CG	A	0.00020	mg/L		0.00030	0.00031	0.00030	0.00031	----
Selenium, dissolved	7782-49-2	E421/CG	A	0.000050	mg/L		0.000244	0.000259	0.000281	0.000254	----
Silicon, dissolved	7440-21-3	E421/CG	A	0.050	mg/L		2.11	2.04	2.12	2.10	----
Silver, dissolved	7440-22-4	E421/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, dissolved	7440-23-5	E421/CG	A	0.050	mg/L		1.00	0.985	1.01	1.01	----
Strontium, dissolved	7440-24-6	E421/CG	A	0.00020	mg/L		0.106	0.101	0.104	0.102	----
Sulfur, dissolved	7704-34-9	E421/CG	A	0.50	mg/L		3.72	3.48	3.81	3.78	----
Tellurium, dissolved	13494-80-9	E421/CG	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Thallium, dissolved	7440-28-0	E421/CG	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Thorium, dissolved	7440-29-1	E421/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Tin, dissolved	7440-31-5	E421/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Titanium, dissolved	7440-32-6	E421/CG	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
Tungsten, dissolved	7440-33-7	E421/CG	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Uranium, dissolved	7440-61-1	E421/CG	A	0.000010	mg/L		0.000404	0.000393	0.000404	0.000407	----
Vanadium, dissolved	7440-62-2	E421/CG	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Zinc, dissolved	7440-66-6	E421/CG	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	W1-SHALLOW	W1-DEEP	D1-SHALLOW	D1-DEEP	TRAVEL BLANK
						Client sampling date / time	19-Oct-2022 07:50	19-Oct-2022 08:30	19-Oct-2022 10:25	19-Oct-2022 09:55	19-Oct-2022 00:00
							FJ2202978-001	FJ2202978-002	FJ2202978-003	FJ2202978-004	FJ2202978-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Zirconium, dissolved	7440-67-7	E421/CG	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
Dissolved MeHg filtration location	----	EP537/VA		-	-		Field	Field	Field	Field	----
Dissolved mercury filtration location	----	EP509-L/VA		-	-		Field	Field	Field	Field	----
Dissolved metals filtration location	----	EP421/CG		-	-		Field	Field	Field	Field	----
Speciated Metals											
Methylmercury (as MeHg), total	22967-92-6	E536/VA	B	0.000000020	mg/L		<0.000000020	<0.000000020	<0.000000020	<0.000000020	----
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	B	0.020	mg/L		0.029	<0.020	<0.020	<0.020	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	B	0.000000020	mg/L		<0.000000020	<0.000000020	<0.000000020	<0.000000020	----
Plant Pigments											
Chlorophyll a	479-61-8	EC870B/VA		0.010	µg/L		2.56	3.08	2.58	2.60	<0.010
Chlorophyll a	479-61-8	E870B/VA	B	0.0020	µg/sample		0.513	0.617	0.516	0.520	<0.0020

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	: **FJ2202978**	Page	: 1 of 24
Amendment	: **5**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 19-Oct-2022 11:29
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:58
C-O-C number	: 2022-OCT-MON8/9-DAY 1		
Sampler	: ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-DEEP	E298	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) D1-SHALLOW	E298	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-DEEP	E298	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) W1-SHALLOW	E298	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-DEEP	E235.Cl	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE D1-SHALLOW	E235.Cl	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE W1-DEEP	E235.Cl	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
HDPE W1-SHALLOW	E235.Cl	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-DEEP	E378-U	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE D1-SHALLOW	E378-U	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-DEEP	E378-U	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE W1-SHALLOW	E378-U	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-DEEP	E235.F	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE D1-SHALLOW	E235.F	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-DEEP	E235.F	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE W1-SHALLOW	E235.F	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO3-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO3-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO3-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO3-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-DEEP	E235.NO2-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE D1-SHALLOW	E235.NO2-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-DEEP	E235.NO2-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE W1-SHALLOW	E235.NO2-L	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓

Matrix: **Water**

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Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE D1-DEEP	E392	19-Oct-2022	----	----	----		24-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE D1-SHALLOW	E392	19-Oct-2022	----	----	----		24-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-DEEP	E392	19-Oct-2022	----	----	----		24-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE W1-SHALLOW	E392	19-Oct-2022	----	----	----		24-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-DEEP	E235.SO4	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE D1-SHALLOW	E235.SO4	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-DEEP	E235.SO4	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE W1-SHALLOW	E235.SO4	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-DEEP	E375-T	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) D1-SHALLOW	E375-T	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-DEEP	E375-T	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) W1-SHALLOW	E375-T	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) D1-DEEP	E366	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) D1-SHALLOW	E366	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) W1-DEEP	E366	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) W1-SHALLOW	E366	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-DEEP	E372-U	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) D1-SHALLOW	E372-U	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) W1-DEEP	E372-U	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) W1-SHALLOW	E372-U	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) D1-DEEP	E509-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) D1-SHALLOW	E509-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) W1-DEEP	E509-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) W1-SHALLOW	E509-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) D1-DEEP	E421	19-Oct-2022	24-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) D1-SHALLOW	E421	19-Oct-2022	24-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) W1-DEEP	E421	19-Oct-2022	24-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	6 days	✓

Matrix: **Water**

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Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
W1-SHALLOW	E421	19-Oct-2022	24-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
D1-DEEP	E358-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
D1-SHALLOW	E358-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
W1-DEEP	E358-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
W1-SHALLOW	E358-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
D1-DEEP	E355-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
D1-SHALLOW	E355-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W1-DEEP	E355-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
W1-SHALLOW	E355-L	19-Oct-2022	20-Oct-2022	28 days	1 days	✓	20-Oct-2022	28 days	1 days	✓

Matrix: **Water**

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Analyte Group / 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 : Alkalinity Species by Titration										
HDPE D1-DEEP	E290	19-Oct-2022	22-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE D1-SHALLOW	E290	19-Oct-2022	22-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-DEEP	E290	19-Oct-2022	22-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE W1-SHALLOW	E290	19-Oct-2022	22-Oct-2022	14 days	3 days	✓	22-Oct-2022	14 days	3 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-DEEP	E329	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE D1-SHALLOW	E329	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-DEEP	E329	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE W1-SHALLOW	E329	19-Oct-2022	20-Oct-2022	3 days	1 days	✓	20-Oct-2022	3 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE D1-DEEP	E100	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	3 days	✓

Matrix: **Water**

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Analyte Group / 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 : Conductivity in Water										
HDPE D1-SHALLOW	E100	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-DEEP	E100	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE W1-SHALLOW	E100	19-Oct-2022	22-Oct-2022	28 days	3 days	✓	22-Oct-2022	28 days	3 days	✓
Physical Tests : pH by Meter										
HDPE D1-SHALLOW	E108	19-Oct-2022	22-Oct-2022	0.25 hrs	71 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	71 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE D1-DEEP	E108	19-Oct-2022	22-Oct-2022	0.25 hrs	72 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	72 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-DEEP	E108	19-Oct-2022	22-Oct-2022	0.25 hrs	73 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	73 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE W1-SHALLOW	E108	19-Oct-2022	22-Oct-2022	0.25 hrs	74 hrs	× EHTR-FM	22-Oct-2022	0.25 hrs	74 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE D1-DEEP	E162	19-Oct-2022	----	----	----		24-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE D1-SHALLOW	E162	19-Oct-2022	----	----	----		24-Oct-2022	7 days	5 days	✓

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Analyte Group / 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 W1-DEEP	E162	19-Oct-2022	----	----	----		24-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE W1-SHALLOW	E162	19-Oct-2022	----	----	----		24-Oct-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-DEEP	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE D1-SHALLOW	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-DEEP	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE W1-SHALLOW	E160	19-Oct-2022	----	----	----		25-Oct-2022	7 days	6 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-DEEP	E870B	19-Oct-2022	24-Oct-2022	28 days	5 days	✓	24-Oct-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE D1-SHALLOW	E870B	19-Oct-2022	24-Oct-2022	28 days	5 days	✓	24-Oct-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE TRAVEL BLANK	E870B	19-Oct-2022	24-Oct-2022	28 days	5 days	✓	24-Oct-2022	28 days	0 days	✓

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Analyte Group / 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
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-DEEP	E870B	19-Oct-2022	24-Oct-2022	28 days	5 days	✓	24-Oct-2022	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Support Lab Filtered µg)										
Opaque HDPE W1-SHALLOW	E870B	19-Oct-2022	24-Oct-2022	28 days	5 days	✓	24-Oct-2022	28 days	0 days	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE tube TRAVEL BLANK	EF870B	19-Oct-2022	----	----	----		20-Oct-2022	48 hrs	25 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE tube D1-SHALLOW	EF870B	19-Oct-2022	----	----	----		20-Oct-2022	48 hrs	29 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE tube D1-DEEP	EF870B	19-Oct-2022	----	----	----		20-Oct-2022	48 hrs	30 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE tube W1-DEEP	EF870B	19-Oct-2022	----	----	----		20-Oct-2022	48 hrs	31 hrs	✓
Sample Preparation : Chlorophyll-a Filtration by Support Laboratory										
Opaque HDPE tube W1-SHALLOW	EF870B	19-Oct-2022	----	----	----		20-Oct-2022	48 hrs	32 hrs	✓
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) D1-DEEP	E541	19-Oct-2022	24-Nov-2022	7 days	36 days	× EHT	24-Nov-2022	7 days	36 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) D1-SHALLOW	E541	19-Oct-2022	24-Nov-2022	7 days	36 days	× EHT	24-Nov-2022	7 days	36 days	× EHT

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) W1-DEEP	E541	19-Oct-2022	24-Nov-2022	7 days	36 days	× EHT	24-Nov-2022	7 days	36 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) W1-SHALLOW	E541	19-Oct-2022	24-Nov-2022	7 days	36 days	× EHT	24-Nov-2022	7 days	36 days	× EHT
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) D1-DEEP	E537	19-Oct-2022	04-Nov-2022	180 days	16 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) D1-SHALLOW	E537	19-Oct-2022	04-Nov-2022	180 days	16 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) W1-DEEP	E537	19-Oct-2022	04-Nov-2022	180 days	16 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) W1-SHALLOW	E537	19-Oct-2022	04-Nov-2022	180 days	16 days	✓	10-Nov-2022	180 days	6 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) D1-DEEP	E536	19-Oct-2022	03-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	19 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) D1-SHALLOW	E536	19-Oct-2022	03-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	19 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) W1-DEEP	E536	19-Oct-2022	03-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	19 days	✓

Matrix: **Water**

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Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) W1-SHALLOW	E536	19-Oct-2022	03-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	19 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) D1-DEEP	E508-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) D1-SHALLOW	E508-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) W1-DEEP	E508-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) W1-SHALLOW	E508-L	19-Oct-2022	26-Oct-2022	28 days	7 days	✓	26-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) D1-DEEP	E420	19-Oct-2022	23-Oct-2022	180 days	4 days	✓	24-Oct-2022	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) D1-SHALLOW	E420	19-Oct-2022	23-Oct-2022	180 days	4 days	✓	24-Oct-2022	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W1-DEEP	E420	19-Oct-2022	23-Oct-2022	180 days	4 days	✓	24-Oct-2022	180 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) W1-SHALLOW	E420	19-Oct-2022	23-Oct-2022	180 days	4 days	✓	24-Oct-2022	180 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	709480	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	706906	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	706622	1	19	5.2	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	711796	0	5	0.0	5.0	✗
Colour (True) by Spectrometer (5 CU)	E329	706831	1	10	10.0	5.0	✓
Conductivity in Water	E100	709479	1	15	6.6	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712298	1	8	12.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	706185	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706660	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	706619	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	706624	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	706625	1	4	25.0	5.0	✓
pH by Meter	E108	709478	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	706621	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	708441	1	4	25.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709902	1	18	5.5	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	715085	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	710437	1	18	5.5	5.0	✓
Total Methylmercury in Water by GCAFS	E536	728312	2	44	4.5	5.0	✗
Total Nitrogen by Colourimetry	E366	709885	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	706186	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	709210	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708445	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	709480	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	706906	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	706622	1	19	5.2	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	711796	1	5	20.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	706831	1	10	10.0	5.0	✓
Conductivity in Water	E100	709479	1	15	6.6	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	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							
Dissolved Metals in Water by CRC ICPMS	E421	712298	1	8	12.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	706185	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706660	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	706619	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	706624	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	706625	1	4	25.0	5.0	✓
pH by Meter	E108	709478	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	706621	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	708441	1	4	25.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709902	1	18	5.5	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	715085	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	710437	1	18	5.5	5.0	✓
Total Methylmercury in Water by GCAFS	E536	728312	3	44	6.8	5.0	✓
Total Nitrogen by Colourimetry	E366	709885	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	706186	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	709210	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708445	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	709480	1	15	6.6	5.0	✓
Ammonia by Fluorescence	E298	706906	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	706622	1	19	5.2	5.0	✓
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B	711796	1	5	20.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	706831	1	10	10.0	5.0	✓
Conductivity in Water	E100	709479	1	15	6.6	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712298	1	8	12.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	706185	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706660	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	706619	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	706624	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	706625	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	706621	1	19	5.2	5.0	✓
TDS by Gravimetry	E162	708441	1	4	25.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709902	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*
Method Blanks (MB) - Continued							
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	715085	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	710437	1	18	5.5	5.0	✓
Total Methylmercury in Water by GCAFS	E536	728312	3	44	6.8	5.0	✓
Total Nitrogen by Colourimetry	E366	709885	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	706186	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	709210	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	708445	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	706906	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	706622	1	19	5.2	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712298	1	8	12.5	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	730526	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	706185	1	11	9.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	706660	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	706619	1	19	5.2	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	706624	1	4	25.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	706625	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	712325	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	706621	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	709902	1	18	5.5	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	715085	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	710437	1	18	5.5	5.0	✓
Total Methylmercury in Water by GCAFS	E536	728312	2	44	4.5	5.0	×
Total Nitrogen by Colourimetry	E366	709885	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	706186	1	11	9.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	709210	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Calgary	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 - Calgary	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Calgary	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Calgary	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.
Chloride in Water by IC	E235.Cl ALS Environmental - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	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 - Calgary	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Calgary	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Calgary	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 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 Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Calgary	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Calgary	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Calgary	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 CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
Chlorophyll-a by Fluorometry (Support Lab Filtered µg)	E870B ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Calgary	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 - Calgary	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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Calgary	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Calgary	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].
Chlorophyll-a by Fluorometry (Support Lab Filtered µg/L)	EC870B ALS Environmental - Vancouver	Water	CALC	Convert results to sample concentration based on support lab filter information.
Chlorophyll-a Filtration by Support Laboratory	EF870B ALS Environmental - Calgary	Water	EPA 445.0 (mod)	Filtration for chlorophyll-a analysis

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Calgary	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Calgary	Water		Preparation for Total Organic Carbon by Combustion

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Calgary	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Calgary	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Calgary	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.
Chlorophyll-a Extraction (Support Lab Filtered)	EP870B ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202978**	Page	: 1 of 21
Amendment	: **5**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 19-Oct-2022 11:29
PO	: 1200-25.03.02	Date Analysis Commenced	: 20-Oct-2022
C-O-C number	: 2022-OCT-MON8/9-DAY 1	Issue Date	: 25-Aug-2023 17:58
Sampler	: ---- ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Anthony Calero	Supervisor - Inorganic	Calgary Inorganics, Calgary, Alberta
Anthony Calero	Supervisor - Inorganic	Calgary Metals, Calgary, Alberta
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Elke Tabora		Calgary Inorganics, Calgary, Alberta
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Harpreet Chawla	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Louis Wagner	Technical Specialist	Calgary Administration, Calgary, Alberta
Louis Wagner	Technical Specialist	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Millicent Brentnall	Laboratory Analyst	Calgary Metals, Calgary, Alberta
Parker Sgarbossa	Laboratory Analyst	Calgary Inorganics, Calgary, Alberta

Ruifang Zheng	Analyst	Calgary Inorganics, Calgary, Alberta
Sara Niroomand		Calgary Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Calgary Inorganics, Calgary, Alberta
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Vladka Stamenova	Analyst	Calgary Inorganics, Calgary, Alberta

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: 706831)											
CG2214572-001	Anonymous	Colour, true	----	E329	5.0	CU	138	136	1.19%	20%	----
Physical Tests (QC Lot: 708441)											
FJ2202978-001	W1-SHALLOW	Solids, total dissolved [TDS]	----	E162	20	mg/L	110	108	3	Diff <2x LOR	----
Physical Tests (QC Lot: 708445)											
CG2214684-004	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	10.5	10.3	0.2	Diff <2x LOR	----
Physical Tests (QC Lot: 709478)											
CG2214644-003	Anonymous	pH	----	E108	0.10	pH units	5.24	5.45	3.93%	4%	----
Physical Tests (QC Lot: 709479)											
CG2214645-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	1260	1270	0.710%	10%	----
Physical Tests (QC Lot: 709480)											
CG2214645-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	319	322	0.905%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	319	322	0.905%	20%	----
Anions and Nutrients (QC Lot: 706619)											
CG2214600-001	Anonymous	Fluoride	16984-48-8	E235.F	0.400	mg/L	<0.400	<0.400	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 706621)											
CG2214600-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	6.00	mg/L	3410	3450	1.16%	20%	----
Anions and Nutrients (QC Lot: 706622)											
CG2214600-001	Anonymous	Chloride	16887-00-6	E235.Cl	10.0	mg/L	509	512	0.615%	20%	----
Anions and Nutrients (QC Lot: 706624)											
FJ2202978-001	W1-SHALLOW	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0688	0.0668	2.95%	20%	----
Anions and Nutrients (QC Lot: 706625)											
FJ2202978-001	W1-SHALLOW	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0017	0.0016	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 706660)											
CG2214557-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 706906)											
CG2214603-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.380	0.380	0.0263%	20%	----
Anions and Nutrients (QC Lot: 709210)											
FC2202569-008	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0063	0.0058	0.0005	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*
Anions and Nutrients (QC Lot: 709885)											
FJ2202978-001	W1-SHALLOW	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.155	0.155	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 709902)											
CG2214526-005	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0822	0.0815	0.799%	20%	----
Anions and Nutrients (QC Lot: 712325)											
FJ2202956-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	4.16	4.16	0.002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 706185)											
FJ2202978-001	W1-SHALLOW	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.69	3.04	0.35	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 706186)											
FJ2202978-001	W1-SHALLOW	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.61	2.58	0.03	Diff <2x LOR	----
Total Metals (QC Lot: 710437)											
CG2214619-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0060	mg/L	<0.0060	<0.0060	0	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00020	mg/L	0.00068	0.00071	0.00002	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00020	mg/L	0.00020	0.00021	0.000004	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00020	mg/L	0.0301	0.0301	0.0593%	20%	----
		Beryllium, total	7440-41-7	E420	0.000040	mg/L	<0.040 µg/L	<0.000040	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	<0.020	<0.020	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000100	mg/L	1.41 µg/L	0.00150	6.43%	20%	----
		Calcium, total	7440-70-2	E420	0.100	mg/L	472	479	1.66%	20%	----
		Cesium, total	7440-46-2	E420	0.000020	mg/L	0.000027	0.000030	0.000002	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	0.00020	mg/L	0.77 µg/L	0.00077	0.000002	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00100	mg/L	0.00102	<0.00100	0.00002	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0020	mg/L	0.0911	0.0889	2.42%	20%	----
		Magnesium, total	7439-95-4	E420	0.0100	mg/L	364	368	0.939%	20%	----
		Manganese, total	7439-96-5	E420	0.00020	mg/L	0.00574	0.00585	1.96%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.00402	0.00415	3.01%	20%	----
		Nickel, total	7440-02-0	E420	0.00100	mg/L	0.0658	0.0658	0.0509%	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	5.30	5.28	0.325%	20%	----
		Rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00386	0.00379	0.00008	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000100	mg/L	588 µg/L	0.594	0.969%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 710437) - continued											
CG2214619-001	Anonymous	Silicon, total	7440-21-3	E420	0.20	mg/L	2.69	2.65	1.54%	20%	----
		Silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.100	mg/L	2.63	2.65	0.638%	20%	----
		Strontium, total	7440-24-6	E420	0.00040	mg/L	0.289	0.296	2.51%	20%	----
		Sulfur, total	7704-34-9	E420	1.00	mg/L	775	752	3.08%	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	0.000069	0.000066	0.000003	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	<0.00060	<0.00060	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000020	mg/L	0.0198	0.0195	1.19%	20%	----
		Vanadium, total	7440-62-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0060	mg/L	0.0795	0.0787	1.05%	20%	----
		Zirconium, total	7440-67-7	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
Total Metals (QC Lot: 715085)											
CG2214161-001	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	1.47	1.50	0.02	Diff <2x LOR	----
Dissolved Metals (QC Lot: 712298)											
CG2214693-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0011	0.0011	0.00004	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00026	0.00025	0.00001	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	0.00010	0.000002	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0894	0.0865	3.24%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<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	0.016	0.016	0.0005	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0674 µg/L	0.0000696	3.06%	20%	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	186	188	0.734%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000011	<0.000010	0.000001	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	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00024	0.00025	0.000004	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.012	0.012	0.0005	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0926	0.0934	0.929%	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: 712298) - continued											
CG2214693-001	Anonymous	Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	105	101	4.54%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00906	0.00862	5.00%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00727	0.00730	0.392%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00845	0.00827	2.11%	20%	----
		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	2.89	2.77	4.19%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00171	0.00161	0.00010	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	89.1 µg/L	0.0898	0.857%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.80	1.74	3.67%	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	6.53	6.26	4.28%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.232	0.234	0.559%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	181	181	0.133%	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	0.00000005	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	0.00607	0.00605	0.286%	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	0.0031	0.0029	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: 715134)											
FJ2202978-001	W1-SHALLOW	Mercury, dissolved	7439-97-6	E509-L	0.50	ng/L	<0.50	<0.50	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 728312)											
FJ2202949-005	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000080	µg/L	<0.000000080 mg/L	<0.000080	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 730526)											
FJ2202949-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000000125 mg/L	0.000149	17.0%	30%	----
Speciated Metals (QC Lot: 733968)											
FJ2202978-004	D1-DEEP	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 747329)											

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*
Speciated Metals (QC Lot: 747329) - continued											
FJ2202978-002	W1-DEEP	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 756854)											
FJ2202949-001	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.046	0.046	0.0002	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: 706831)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 708441)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 708445)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 709479)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 709480)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 706619)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 706621)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 706622)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 706624)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 706625)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 706660)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 706906)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 709210)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 709885)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 709902)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 712325)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 706185)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 706186)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 710437)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 710437) - continued						
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 715085)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 712298)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 712298) - continued						
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 715134)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 728312)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 730526)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733968)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 740379)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 747329)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 756854)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----
Plant Pigments (QCLot: 711796)						
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	<0.0020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 706831)									
Colour, true	----	E329	5	CU	100 CU	95.8	85.0	115	----
Physical Tests (QCLot: 708441)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.6	85.0	115	----
Physical Tests (QCLot: 708445)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	106	85.0	115	----
Physical Tests (QCLot: 709478)									
pH	----	E108	----	pH units	7 pH units	100	98.6	101	----
Physical Tests (QCLot: 709479)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 709480)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 706619)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.6	90.0	110	----
Anions and Nutrients (QCLot: 706621)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 706622)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 706624)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.1	90.0	110	----
Anions and Nutrients (QCLot: 706625)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.7	90.0	110	----
Anions and Nutrients (QCLot: 706660)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 706906)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 709210)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.03 mg/L	105	80.0	120	----
Anions and Nutrients (QCLot: 709885)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.4	75.0	125	----
Anions and Nutrients (QCLot: 709902)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.03 mg/L	100	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 712325)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	104	85.0	115	----
Organic / Inorganic Carbon (QCLot: 706185)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 706186)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	97.5	80.0	120	----
Total Metals (QCLot: 710437)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	94.8	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	87.3	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	89.0	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	91.9	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	80.1	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	83.1	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	83.4	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	87.6	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	91.8	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	86.6	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	92.1	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	91.9	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	90.7	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	90.0	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	86.6	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	105	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	97.5	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	91.2	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	90.4	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	89.8	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	94.8	70.0	130	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	94.6	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	84.6	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	92.7	60.0	140	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	82.0	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	96.4	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	91.8	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 710437) - continued									
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	109	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	81.0	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	83.2	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	81.7	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	88.6	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.5	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	86.6	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	90.7	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	92.5	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	80.8	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	92.3	80.0	120	----
Total Metals (QCLot: 715085)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	102	80.0	120	----
Dissolved Metals (QCLot: 712298)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	102	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.2	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	95.3	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	97.3	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	92.8	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.5	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	93.6	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	99.5	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.8	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	91.7	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	93.5	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.8	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	94.6	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	96.9	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.0	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	94.6	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	91.8	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	102	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 712298) - continued									
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	98.7	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	94.0	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	93.5	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	97.4	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	90.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	97.0	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	105	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	96.0	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	96.8	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	96.6	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	93.3	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.7	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	96.9	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	97.6	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	96.6	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	91.4	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	94.0	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	102	80.0	120	----
Speciated Metals (QCLot: 728312)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	76.3	70.0	130	----
Speciated Metals (QCLot: 730526)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	79.4	70.0	130	----
Speciated Metals (QCLot: 733968)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	79.0	70.0	130	----
Speciated Metals (QCLot: 740379)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.8	70.0	130	----
Speciated Metals (QCLot: 747329)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	73.9	70.0	130	----
Speciated Metals (QCLot: 756854)									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	80.0	120	----
Plant Pigments (QCLot: 711796)									
Chlorophyll a	479-61-8	E870B	0.002	µg/sample	1 µg/sample	95.0	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: 706619)										
CG2214600-002	Anonymous	Fluoride	16984-48-8	E235.F	0.898 mg/L	1 mg/L	89.8	75.0	125	----
Anions and Nutrients (QCLot: 706621)										
CG2214600-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 706622)										
CG2214600-002	Anonymous	Chloride	16887-00-6	E235.Cl	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 706624)										
FJ2202978-002	W1-DEEP	Nitrate (as N)	14797-55-8	E235.NO3-L	2.46 mg/L	2.5 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 706625)										
FJ2202978-002	W1-DEEP	Nitrite (as N)	14797-65-0	E235.NO2-L	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 706660)										
CG2214557-002	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0534 mg/L	0.05 mg/L	107	70.0	130	----
Anions and Nutrients (QCLot: 706906)										
CG2214603-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 709210)										
FC2202573-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 709885)										
FJ2202978-002	W1-DEEP	Nitrogen, total	7727-37-9	E366	0.378 mg/L	0.4 mg/L	94.5	70.0	130	----
Anions and Nutrients (QCLot: 709902)										
FC2202568-001	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 712325)										
FJ2202956-002	Anonymous	Silicate (as SiO2)	7631-86-9	E392	10.4 mg/L	10 mg/L	104	75.0	125	----
Organic / Inorganic Carbon (QCLot: 706185)										
FJ2202978-001	W1-SHALLOW	Carbon, dissolved organic [DOC]	----	E358-L	4.85 mg/L	5 mg/L	97.0	70.0	130	----
Organic / Inorganic Carbon (QCLot: 706186)										
FJ2202978-001	W1-SHALLOW	Carbon, total organic [TOC]	----	E355-L	5.24 mg/L	5 mg/L	105	70.0	130	----
Total Metals (QCLot: 710437)										
CG2214619-003	Anonymous	Aluminum, total	7429-90-5	E420	2.16 mg/L	2 mg/L	108	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: 710437) - continued										
CG2214619-003	Anonymous	Antimony, total	7440-36-0	E420	0.201 mg/L	0.2 mg/L	100	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.203 mg/L	0.2 mg/L	102	70.0	130	----
		Barium, total	7440-39-3	E420	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.403 mg/L	0.4 mg/L	101	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		Boron, total	7440-42-8	E420	1.09 mg/L	1 mg/L	109	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.114 mg/L	0.1 mg/L	114	70.0	130	----
		Chromium, total	7440-47-3	E420	0.414 mg/L	0.4 mg/L	103	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.204 mg/L	0.2 mg/L	102	70.0	130	----
		Copper, total	7440-50-8	E420	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		Iron, total	7439-89-6	E420	20.2 mg/L	20 mg/L	101	70.0	130	----
		Lead, total	7439-92-1	E420	0.215 mg/L	0.2 mg/L	108	70.0	130	----
		Lithium, total	7439-93-2	E420	0.862 mg/L	1 mg/L	86.2	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.202 mg/L	0.2 mg/L	101	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.228 mg/L	0.2 mg/L	114	70.0	130	----
		Nickel, total	7440-02-0	E420	0.390 mg/L	0.4 mg/L	97.5	70.0	130	----
		Phosphorus, total	7723-14-0	E420	104 mg/L	100 mg/L	104	70.0	130	----
		Potassium, total	7440-09-7	E420	40.6 mg/L	40 mg/L	102	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.211 mg/L	0.2 mg/L	106	70.0	130	----
		Selenium, total	7782-49-2	E420	0.396 mg/L	0.4 mg/L	99.1	70.0	130	----
		Silicon, total	7440-21-3	E420	96.4 mg/L	100 mg/L	96.4	70.0	130	----
		Silver, total	7440-22-4	E420	0.0444 mg/L	0.04 mg/L	111	70.0	130	----
		Sodium, total	7440-23-5	E420	19.3 mg/L	20 mg/L	96.4	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	200 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.398 mg/L	0.4 mg/L	99.5	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0417 mg/L	0.04 mg/L	104	70.0	130	----
		Thorium, total	7440-29-1	E420	0.216 mg/L	0.2 mg/L	108	70.0	130	----
		Tin, total	7440-31-5	E420	0.203 mg/L	0.2 mg/L	101	70.0	130	----
		Titanium, total	7440-32-6	E420	0.402 mg/L	0.4 mg/L	100	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.214 mg/L	0.2 mg/L	107	70.0	130	----
		Uranium, total	7440-61-1	E420	0.0424 mg/L	0.04 mg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 710437) - continued										
CG2214619-003	Anonymous	Vanadium, total	7440-62-2	E420	1.03 mg/L	1 mg/L	103	70.0	130	----
		Zinc, total	7440-66-6	E420	3.90 mg/L	4 mg/L	97.6	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.487 mg/L	0.4 mg/L	122	70.0	130	----
Total Metals (QCLot: 715085)										
CG2214161-002	Anonymous	Mercury, total	7439-97-6	E508-L	4.98 ng/L	5 ng/L	99.6	70.0	130	----
Dissolved Metals (QCLot: 712298)										
CG2214807-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	1.87 mg/L	2 mg/L	93.5	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.188 mg/L	0.2 mg/L	93.8	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.187 mg/L	0.2 mg/L	93.3	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.178 mg/L	0.2 mg/L	89.2	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.337 mg/L	0.4 mg/L	84.2	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0885 mg/L	0.1 mg/L	88.5	70.0	130	----
		Boron, dissolved	7440-42-8	E421	1.05 mg/L	1 mg/L	105	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0371 mg/L	0.04 mg/L	92.7	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0978 mg/L	0.1 mg/L	97.8	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.358 mg/L	0.4 mg/L	89.5	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.182 mg/L	0.2 mg/L	91.0	70.0	130	----
		Iron, dissolved	7439-89-6	E421	18.3 mg/L	20 mg/L	91.3	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.184 mg/L	0.2 mg/L	91.8	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.856 mg/L	1 mg/L	85.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	10 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.181 mg/L	0.2 mg/L	90.4	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.358 mg/L	0.4 mg/L	89.6	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	96.5 mg/L	100 mg/L	96.5	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	40 mg/L	ND	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.180 mg/L	0.2 mg/L	90.2	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.380 mg/L	0.4 mg/L	95.1	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	95.0 mg/L	100 mg/L	95.0	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0350 mg/L	0.04 mg/L	87.5	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	200 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
Dissolved Metals (QCLot: 712298) - continued										
CG2214807-001	Anonymous	Tellurium, dissolved	13494-80-9	E421	0.369 mg/L	0.4 mg/L	92.2	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0353 mg/L	0.04 mg/L	88.4	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.189 mg/L	0.2 mg/L	94.4	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.184 mg/L	0.2 mg/L	92.3	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.378 mg/L	0.4 mg/L	94.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.185 mg/L	0.2 mg/L	92.7	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.931 mg/L	1 mg/L	93.1	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.393 mg/L	0.4 mg/L	98.3	70.0	130	----
Dissolved Metals (QCLot: 715134)										
FJ2202978-002	W1-DEEP	Mercury, dissolved	7439-97-6	E509-L	5.35 ng/L	5 ng/L	107	70.0	130	----
Speciated Metals (QCLot: 728312)										
FJ2202978-001	W1-SHALLOW	Methylmercury (as MeHg), total	22967-92-6	E536	0.00178 µg/L	0.0025 µg/L	71.1	60.0	140	----
Speciated Metals (QCLot: 730526)										
FJ2202949-002	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00417 µg/L	0.0025 µg/L	83.5	60.0	140	----
Speciated Metals (QCLot: 733968)										
FJ2202994-003	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00175 µg/L	0.0025 µg/L	70.0	60.0	140	----
Speciated Metals (QCLot: 747329)										
VA22C5113-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00176 µg/L	0.0025 µg/L	70.4	60.0	140	----
Speciated Metals (QCLot: 756854)										
FJ2202949-002	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.355 mg/L	0.5 mg/L	71.1	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-MON8/9- Day 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	
ALS Lab Work Order # (ALS use only):	

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QC! 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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH (F)	Chlorophyll-a by fluorometry (P)	DOC, Total dissolved P (F/P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness (F)	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L) (F)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L) (F)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1-Shallow	19-10-22	7:50	Water	10	R	R	R	R	R	R	R	R	R	R	R			
	W1-Deep	19-10-22	8:30	Water	10	R	R	R	R	R	R	R	R	R	R	R			
	D1-Shallow	19-10-22	10:25	Water	10	R	R	R	R	R	R	R	R	R	R	R			
	D1-Deep	19-10-22	9:55	Water	10	R	R	R	R	R	R	R	R	R	R	R			
	Travel Blank			Water	1		R												

Fort St. John
Work Order Reference
FJ2202978

Telephone : +1 250 261 5517

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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
	csuzanne@ecofishresearch.com kganshorn@azimuthgroup.ca

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			
10 C							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: BM	Date: ~~19 Oct 2022~~ 19 Oct 2022	Time:	Received by:	Date: 10-19-22	Time: 12:29	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202994**	Page	: 1 of 9
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 20-Oct-2022 15:28
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-Mon8/9-Day3	Issue Date	: 25-Aug-2023 17:58
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kenson Lo		Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, 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*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PD2-A	PD2-B	PD5	PD3	Travel Blank
						Client sampling date / time	20-Oct-2022 13:15	20-Oct-2022 13:15	20-Oct-2022 07:45	20-Oct-2022 11:40	20-Oct-2022 00:00
							FJ2202994-001	FJ2202994-002	FJ2202994-003	FJ2202994-004	FJ2202994-005
							Result	Result	Result	Result	Result
Sample Preparation											
Dissolved Fe2 filtration location	----	EP541/VA		-	-		Field	Field	Field	Field	----
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		77.2	77.3	79.2	78.5	<1.0
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L		77.2	77.3	79.2	78.5	<1.0
Colour, true	----	E329/VA	A	5.0	CU		6.3	6.3	7.1	6.0	<5.0
Conductivity	----	E100/VA	A	2.0	µS/cm		178	179	186	184	<2.0
Hardness (as CaCO3), dissolved	----	EC100/VA		0.50	mg/L		86.2	86.9	90.5	88.3	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA		0.50	mg/L		91.6	90.6	94.3	93.9	<0.50
pH	----	E108/VA	A	0.10	pH units		8.18	8.20	8.20	8.21	5.44
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L		111	112	112	108	<10
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L		10.2	12.6	13.4	10.6	<3.0
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L		<0.0050	<0.0050	0.0103	0.0075	<0.0050
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L		0.038	0.037	0.038	0.037	<0.020
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L		0.114	0.110	0.136	0.100	<0.050
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L		0.0610	0.0594	0.0556	0.0547	<0.0050
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L		0.175	0.169	0.192	0.155	<0.030
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L		0.0156	0.0212	0.0188	0.0238	<0.0020
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L		4.18	4.15	4.07	4.09	<0.50
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L		13.0	12.9	13.4	13.0	<0.30
Nitrate + Nitrite (as N)	----	EC235.N+N/VA		0.0032	mg/L		0.0610	0.0594	0.0556	0.0547	<0.0051

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PD2-A	PD2-B	PD5	PD3	Travel Blank
						Client sampling date / time	20-Oct-2022 13:15	20-Oct-2022 13:15	20-Oct-2022 07:45	20-Oct-2022 11:40	20-Oct-2022 00:00
							FJ2202994-001	FJ2202994-002	FJ2202994-003	FJ2202994-004	FJ2202994-005
							Result	Result	Result	Result	Result
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L		3.06	2.86	3.53	2.93	----
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L		3.01	3.11	3.66	3.24	<0.50
Ion Balance											
Anion sum	----	EC101/VA		0.10	meq/L		1.82	1.82	1.87	1.84	----
Anion sum	----	EC101A/VA		0.10	meq/L		----	----	----	----	<0.10
Cation sum (total)	----	EC101A/VA		0.10	meq/L		----	----	----	----	<0.10
Cation sum	----	EC101/VA		0.10	meq/L		1.78	1.79	1.88	1.82	----
Ion balance (APHA)	----	EC101A/VA		0.010	%		----	----	----	----	<0.010
Ion balance (APHA)	----	EC101/VA		0.01	%		1.11	0.83	0.27	0.55	----
Total Metals											
Aluminum, total	7429-90-5	E420/VA	A	0.0030	mg/L		0.155	0.146	0.194	0.138	<0.0030
Antimony, total	7440-36-0	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, total	7440-38-2	E420/VA	A	0.00010	mg/L		0.00032	0.00032	0.00036	0.00026	<0.00010
Barium, total	7440-39-3	E420/VA	A	0.00010	mg/L		0.0368	0.0364	0.0414	0.0370	<0.00010
Beryllium, total	7440-41-7	E420/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth, total	7440-69-9	E420/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium, total	7440-43-9	E420/VA	A	0.0000050	mg/L		0.0000239	0.0000239	0.0000257	0.0000188	<0.0000050
Calcium, total	7440-70-2	E420/VA	A	0.050	mg/L		26.5	26.2	27.3	27.2	<0.050
Cesium, total	7440-46-2	E420/VA	A	0.000010	mg/L		0.000038	0.000042	0.000053	0.000034	<0.000010
Chromium, total	7440-47-3	E420/VA	A	0.00050	mg/L		0.00051	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, total	7440-48-4	E420/VA	A	0.00010	mg/L		0.00012	0.00012	0.00017	0.00011	<0.00010
Copper, total	7440-50-8	E420/VA	A	0.00050	mg/L		0.00094	0.00098	0.00102	0.00091	<0.00050
Iron, total	7439-89-6	E420/VA	A	0.010	mg/L		0.256	0.271	0.353	0.228	<0.010
Lead, total	7439-92-1	E420/VA	A	0.000050	mg/L		0.000140	0.000150	0.000197	0.000123	<0.000050
Lithium, total	7439-93-2	E420/VA	A	0.0010	mg/L		0.0014	0.0014	0.0016	0.0015	<0.0010
Magnesium, total	7439-95-4	E420/VA	A	0.0050	mg/L		6.18	6.11	6.34	6.32	<0.0050
Manganese, total	7439-96-5	E420/VA	A	0.00010	mg/L		0.00710	0.00726	0.00915	0.00676	<0.00010
Mercury, total	7439-97-6	E508-L/VA	A	0.50	ng/L		<0.50	<0.50	0.56	<0.50	<0.50
Molybdenum, total	7439-98-7	E420/VA	A	0.000050	mg/L		0.000825	0.000830	0.000858	0.000864	<0.000050

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PD2-A	PD2-B	PD5	PD3	Travel Blank
						Client sampling date / time	20-Oct-2022 13:15	20-Oct-2022 13:15	20-Oct-2022 07:45	20-Oct-2022 11:40	20-Oct-2022 00:00
							FJ2202994-001	FJ2202994-002	FJ2202994-003	FJ2202994-004	FJ2202994-005
							Result	Result	Result	Result	Result
Total Metals											
Nickel, total	7440-02-0	E420/VA	A	0.00050	mg/L		0.00101	0.00105	0.00108	0.00093	<0.00050
Phosphorus, total	7723-14-0	E420/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, total	7440-09-7	E420/VA	A	0.050	mg/L		0.477	0.487	0.499	0.466	<0.050
Rubidium, total	7440-17-7	E420/VA	A	0.00020	mg/L		0.00072	0.00067	0.00082	0.00066	<0.00020
Selenium, total	7782-49-2	E420/VA	A	0.000050	mg/L		0.000307	0.000286	0.000264	0.000252	<0.000050
Silicon, total	7440-21-3	E420/VA	A	0.10	mg/L		2.09	2.13	2.30	2.05	<0.10
Silver, total	7440-22-4	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, total	7440-23-5	E420/VA	A	0.050	mg/L		1.08	1.07	1.29	1.14	<0.050
Strontium, total	7440-24-6	E420/VA	A	0.00020	mg/L		0.104	0.105	0.114	0.105	<0.00020
Sulfur, total	7704-34-9	E420/VA	A	0.50	mg/L		3.86	4.23	4.70	4.45	<0.50
Tellurium, total	13494-80-9	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	7440-28-0	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium, total	7440-29-1	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	7440-31-5	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420/VA	A	0.00030	mg/L		0.00293	0.00225	<0.00360 DLM	<0.00300 DLM	<0.00030
Tungsten, total	7440-33-7	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, total	7440-61-1	E420/VA	A	0.000010	mg/L		0.000458	0.000474	0.000478	0.000483	<0.000010
Vanadium, total	7440-62-2	E420/VA	A	0.00050	mg/L		0.00089	0.00089	0.00108	0.00078	<0.00050
Zinc, total	7440-66-6	E420/VA	A	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium, total	7440-67-7	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	A	0.0010	mg/L		0.0042	0.0075	0.0043	0.0058	----
Antimony, dissolved	7440-36-0	E421/VA	A	0.00010	mg/L		0.00013	0.00011	<0.00010	<0.00010	----
Arsenic, dissolved	7440-38-2	E421/VA	A	0.00010	mg/L		0.00018	0.00020	0.00020	0.00018	----
Barium, dissolved	7440-39-3	E421/VA	A	0.00010	mg/L		0.0323	0.0312	0.0366	0.0321	----
Beryllium, dissolved	7440-41-7	E421/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
Bismuth, dissolved	7440-69-9	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Boron, dissolved	7440-42-8	E421/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Cadmium, dissolved	7440-43-9	E421/VA	A	0.0000050	mg/L		0.0000076	0.0000068	0.0000057	0.0000061	----
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L		25.3	25.7	25.9	25.9	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PD2-A	PD2-B	PD5	PD3	Travel Blank
						Client sampling date / time	20-Oct-2022 13:15	20-Oct-2022 13:15	20-Oct-2022 07:45	20-Oct-2022 11:40	20-Oct-2022 00:00
							FJ2202994-001	FJ2202994-002	FJ2202994-003	FJ2202994-004	FJ2202994-005
							Result	Result	Result	Result	Result
Dissolved Metals											
Cesium, dissolved	7440-46-2	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Chromium, dissolved	7440-47-3	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Cobalt, dissolved	7440-48-4	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Copper, dissolved	7440-50-8	E421/VA	A	0.00020	mg/L		0.00058	0.00061	0.00061	0.00058	----
Iron, dissolved	7439-89-6	E421/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Lead, dissolved	7439-92-1	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Lithium, dissolved	7439-93-2	E421/VA	A	0.0010	mg/L		0.0012	0.0012	0.0013	0.0013	----
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L		5.58	5.53	6.28	5.73	----
Manganese, dissolved	7439-96-5	E421/VA	A	0.00010	mg/L		0.00075	0.00091	0.00067	0.00067	----
Mercury, dissolved	7439-97-6	E509-L/VA	A	0.50	ng/L		<0.50	<0.50	<0.50	<0.50	----
Molybdenum, dissolved	7439-98-7	E421/VA	A	0.000050	mg/L		0.000792	0.000761	0.000778	0.000799	----
Nickel, dissolved	7440-02-0	E421/VA	A	0.00050	mg/L		0.00058	0.00059	0.00065	0.00059	----
Phosphorus, dissolved	7723-14-0	E421/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Potassium, dissolved	7440-09-7	E421/VA	A	0.050	mg/L		0.431	0.421	0.440	0.422	----
Rubidium, dissolved	7440-17-7	E421/VA	A	0.00020	mg/L		0.00026	0.00030	0.00024	0.00028	----
Selenium, dissolved	7782-49-2	E421/VA	A	0.000050	mg/L		0.000256	0.000251	0.000253	0.000247	----
Silicon, dissolved	7440-21-3	E421/VA	A	0.050	mg/L		1.87	1.87	1.90	1.88	----
Silver, dissolved	7440-22-4	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, dissolved	7440-23-5	E421/VA	A	0.050	mg/L		1.07	1.06	1.32	1.14	----
Strontium, dissolved	7440-24-6	E421/VA	A	0.00020	mg/L		0.103	0.104	0.105	0.106	----
Sulfur, dissolved	7704-34-9	E421/VA	A	0.50	mg/L		4.46	4.53	4.62	4.69	----
Tellurium, dissolved	13494-80-9	E421/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Thallium, dissolved	7440-28-0	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Thorium, dissolved	7440-29-1	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Tin, dissolved	7440-31-5	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Titanium, dissolved	7440-32-6	E421/VA	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
Tungsten, dissolved	7440-33-7	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Uranium, dissolved	7440-61-1	E421/VA	A	0.000010	mg/L		0.000422	0.000427	0.000390	0.000441	----
Vanadium, dissolved	7440-62-2	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Zinc, dissolved	7440-66-6	E421/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PD2-A	PD2-B	PD5	PD3	Travel Blank
					Client sampling date / time	20-Oct-2022 13:15	20-Oct-2022 13:15	20-Oct-2022 07:45	20-Oct-2022 11:40	20-Oct-2022 00:00
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2202994-001	FJ2202994-002	FJ2202994-003	FJ2202994-004	FJ2202994-005
						Result	Result	Result	Result	Result
Dissolved Metals										
Zirconium, dissolved	7440-67-7	E421/VA	A	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	----
Dissolved MeHg filtration location	----	EP537/VA		-	-	Field	Field	Field	Field	----
Dissolved mercury filtration location	----	EP509-L/VA		-	-	Field	Field	Field	Field	----
Dissolved metals filtration location	----	EP421/VA		-	-	Field	Field	Field	Field	----
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	A	0.000000020	mg/L	<0.000000020	0.000000023	0.000000148	0.000000065	<0.000000020
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	A	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	<0.000000020	<0.000000020	----

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	: **FJ2202994**	Page	: 1 of 25
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 20-Oct-2022 15:28
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:58
C-O-C number	: 2022-Oct-Mon8/9-Day3		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

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 / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD2-A	E298	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD2-B	E298	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD3	E298	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PD5	E298	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) Travel Blank	E298	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	28 days	0 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2-A	E235.Cl	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD2-B	E235.Cl	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
HDPE PD3	E235.Cl	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PD5	E235.Cl	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Travel Blank	E235.Cl	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2-A	E378-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD2-B	E378-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD3	E378-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PD5	E378-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Travel Blank	E378-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2-A	E235.F	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD2-B	E235.F	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD3	E235.F	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PD5	E235.F	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Travel Blank	E235.F	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2-A	E235.NO3-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD2-B	E235.NO3-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD3	E235.NO3-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PD5	E235.NO3-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Nitrate in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO3-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
PD2-A	E235.NO2-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
PD2-B	E235.NO2-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
PD3	E235.NO2-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
PD5	E235.NO2-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
Travel Blank	E235.NO2-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
PD2-A	E392	20-Oct-2022	----	----	----		26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
PD2-B	E392	20-Oct-2022	----	----	----		26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE										
PD3	E392	20-Oct-2022	----	----	----		26-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Reactive Silica by Colourimetry										
HDPE PD5	E392	20-Oct-2022	----	----	----		26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Travel Blank	E392	20-Oct-2022	----	----	----		26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2-A	E235.SO4	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD2-B	E235.SO4	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD3	E235.SO4	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PD5	E235.SO4	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Travel Blank	E235.SO4	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2-A	E375-T	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD2-B	E375-T	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD3	E375-T	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PD5	E375-T	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2-A	E366	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD2-B	E366	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD3	E366	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PD5	E366	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved) Travel Blank	E366	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	26-Oct-2022	28 days	1 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2-A	E372-U	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD2-B	E372-U	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD3	E372-U	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PD5	E372-U	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved) Travel Blank	E372-U	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	26-Oct-2022	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD2-A	E509-L	20-Oct-2022	26-Oct-2022	28 days	6 days	✓	26-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD2-B	E509-L	20-Oct-2022	26-Oct-2022	28 days	6 days	✓	26-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD3	E509-L	20-Oct-2022	26-Oct-2022	28 days	6 days	✓	26-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PD5	E509-L	20-Oct-2022	26-Oct-2022	28 days	6 days	✓	26-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD2-A	E421	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD2-B	E421	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD3	E421	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PD5	E421	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	25-Oct-2022	180 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2-A	E358-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD2-B	E358-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD3	E358-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PD5	E358-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2-A	E355-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD2-B	E355-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD3	E355-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PD5	E355-L	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (lab preserved) Travel Blank	E355-L	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	28 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2-A	E290	20-Oct-2022	25-Oct-2022	14 days	5 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD2-B	E290	20-Oct-2022	25-Oct-2022	14 days	5 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD3	E290	20-Oct-2022	25-Oct-2022	14 days	5 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PD5	E290	20-Oct-2022	25-Oct-2022	14 days	5 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	20-Oct-2022	25-Oct-2022	14 days	5 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2-A	E329	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD2-B	E329	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PD3	E329	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PD5	E329	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Travel Blank	E329	20-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Conductivity in Water										
HDPE PD2-A	E100	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD2-B	E100	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD3	E100	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PD5	E100	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE Travel Blank	E100	20-Oct-2022	25-Oct-2022	28 days	5 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE PD2-A	E108	20-Oct-2022	25-Oct-2022	0.25 hrs	112 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	124 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 PD2-B	E108	20-Oct-2022	25-Oct-2022	0.25 hrs	112 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	124 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE Travel Blank	E108	20-Oct-2022	25-Oct-2022	0.25 hrs	112 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	124 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD3	E108	20-Oct-2022	25-Oct-2022	0.25 hrs	114 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	125 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PD5	E108	20-Oct-2022	25-Oct-2022	0.25 hrs	118 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	129 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PD2-A	E162	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD2-B	E162	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD3	E162	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PD5	E162	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Travel Blank	E162	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : TSS by Gravimetry										
HDPE PD2-A	E160	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD2-B	E160	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD3	E160	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PD5	E160	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Travel Blank	E160	20-Oct-2022	----	----	----		25-Oct-2022	7 days	5 days	✓
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PD2-A	E541	20-Oct-2022	24-Nov-2022	7 days	35 days	× EHT	24-Nov-2022	7 days	35 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PD2-B	E541	20-Oct-2022	24-Nov-2022	7 days	35 days	× EHT	24-Nov-2022	7 days	35 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PD3	E541	20-Oct-2022	24-Nov-2022	7 days	35 days	× EHT	24-Nov-2022	7 days	35 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PD5	E541	20-Oct-2022	24-Nov-2022	7 days	35 days	× EHT	24-Nov-2022	7 days	35 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD2-A	E537	20-Oct-2022	07-Nov-2022	180 days	18 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD2-B	E537	20-Oct-2022	07-Nov-2022	180 days	18 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD3	E537	20-Oct-2022	07-Nov-2022	180 days	18 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PD5	E537	20-Oct-2022	07-Nov-2022	180 days	18 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PD2-A	E536	20-Oct-2022	05-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	18 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PD2-B	E536	20-Oct-2022	05-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	18 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PD3	E536	20-Oct-2022	05-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	18 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PD5	E536	20-Oct-2022	05-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	18 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) Travel Blank	E536	20-Oct-2022	05-Nov-2022	180 days	16 days	✓	07-Nov-2022	180 days	18 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD2-A	E508-L	20-Oct-2022	27-Oct-2022	28 days	7 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD2-B	E508-L	20-Oct-2022	27-Oct-2022	28 days	7 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD3	E508-L	20-Oct-2022	27-Oct-2022	28 days	7 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PD5	E508-L	20-Oct-2022	27-Oct-2022	28 days	7 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) Travel Blank	E508-L	20-Oct-2022	27-Oct-2022	28 days	7 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD2-A	E420	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	26-Oct-2022	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD2-B	E420	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	26-Oct-2022	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD3	E420	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	26-Oct-2022	180 days	6 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PD5	E420	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	26-Oct-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
Travel Blank	E420	20-Oct-2022	25-Oct-2022	180 days	5 days	✓	26-Oct-2022	180 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	712518	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	712921	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	712522	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	712528	1	8	12.5	5.0	✓
Conductivity in Water	E100	712519	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712946	1	20	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	712916	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	712527	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	712521	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712523	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712524	1	20	5.0	5.0	✓
pH by Meter	E108	712517	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	716357	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	712525	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	712920	1	19	5.2	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717310	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	712956	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	42	4.7	5.0	×
Total Nitrogen by Colourimetry	E366	712918	2	31	6.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	712917	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	712919	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	712518	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	712921	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	712522	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	712528	1	8	12.5	5.0	✓
Conductivity in Water	E100	712519	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712946	1	20	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	712916	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	712527	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	712521	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712523	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712524	1	20	5.0	5.0	✓
pH by Meter	E108	712517	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	716357	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	712525	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	712920	1	19	5.2	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717310	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	712956	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	3	42	7.1	5.0	✓
Total Nitrogen by Colourimetry	E366	712918	2	31	6.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	712917	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	712919	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	712518	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	712921	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	712522	1	20	5.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	712528	1	8	12.5	5.0	✓
Conductivity in Water	E100	712519	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712946	1	20	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	712916	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	712527	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	712521	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712523	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712524	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	716357	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	712525	1	18	5.5	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	712920	1	19	5.2	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717310	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	712956	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	3	42	7.1	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*
Method Blanks (MB) - Continued							
Total Nitrogen by Colourimetry	E366	712918	2	31	6.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	712917	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	712919	2	37	5.4	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	712921	2	37	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	712522	1	20	5.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	715134	1	8	12.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	712946	1	20	5.0	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	712916	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	712527	1	9	11.1	5.0	✓
Fluoride in Water by IC	E235.F	712521	1	18	5.5	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	712523	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	712524	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	716357	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	712525	1	18	5.5	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	712920	1	19	5.2	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717310	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	712956	1	20	5.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	42	4.7	5.0	×
Total Nitrogen by Colourimetry	E366	712918	2	31	6.4	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	712917	2	27	7.4	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	712919	2	37	5.4	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
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.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Ion Balance using Total Metals	EC101A ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202994**	Page	: 1 of 22
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 20-Oct-2022 15:28
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-Mon8/9-Day3	Issue Date	: 25-Aug-2023 17:58
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Caitlin Macey	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kenson Lo		Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Kyle Chang	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, 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: 712517)											
YL2201885-001	Anonymous	pH	----	E108	0.10	pH units	8.17	8.19	0.196%	4%	----
Physical Tests (QC Lot: 712518)											
YL2201885-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	118	117	0.581%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	118	117	0.581%	20%	----
Physical Tests (QC Lot: 712519)											
YL2201885-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	7600	7600	0.00%	10%	----
Physical Tests (QC Lot: 712528)											
FJ2202994-001	PD2-A	Colour, true	----	E329	5.0	CU	6.3	6.1	0.2	Diff <2x LOR	----
Physical Tests (QC Lot: 714283)											
FJ2202955-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 714302)											
FJ2202955-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	318	305	4.18%	20%	----
Anions and Nutrients (QC Lot: 712521)											
FJ2203002-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.291	0.299	2.81%	20%	----
Anions and Nutrients (QC Lot: 712522)											
FJ2203002-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712523)											
FJ2203002-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712524)											
FJ2203002-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712525)											
FJ2203002-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.08	3.00	2.55%	20%	----
Anions and Nutrients (QC Lot: 712527)											
FJ2202994-001	PD2-A	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712918)											
FJ2202994-001	PD2-A	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.175	0.149	0.027	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712919)											
FJ2202994-001	PD2-A	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0156	0.0160	0.0003	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*
Anions and Nutrients (QC Lot: 712920)											
FJ2202994-001	PD2-A	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 712921)											
FJ2202994-001	PD2-A	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 713226)											
FJ2202994-005	Travel Blank	Nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 713227)											
FJ2202994-005	Travel Blank	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 713228)											
FJ2202994-005	Travel Blank	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 716357)											
EO2209213-021	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	15.3	15.2	0.638%	20%	----
Organic / Inorganic Carbon (QC Lot: 712916)											
FJ2202994-001	PD2-A	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.06	2.94	0.12	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 712917)											
FJ2202994-001	PD2-A	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.01	2.99	0.02	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 713225)											
FJ2202994-005	Travel Blank	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 712956)											
FJ2202994-001	PD2-A	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.155	0.167	7.18%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00032	0.00032	0.000005	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0368	0.0384	4.18%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000239	0.0000264	0.0000025	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	26.5	26.6	0.477%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000038	0.000039	0.0000010	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00051	<0.00050	0.00001	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00012	0.00014	0.00002	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00094	0.00096	0.00001	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.256	0.268	4.30%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000140	0.000139	0.0000008	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0014	0.0014	0.00006	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: 712956) - continued											
FJ2202994-001	PD2-A	Magnesium, total	7439-95-4	E420	0.0050	mg/L	6.18	6.10	1.39%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00710	0.00721	1.55%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000825	0.000892	7.78%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00101	0.00106	0.00005	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.477	0.479	0.002	Diff <2x LOR	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00072	0.00072	0.0000004	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000307	0.000268	0.000039	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	2.09	2.18	4.44%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	1.08	1.08	0.360%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.104	0.108	2.88%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	3.86	4.02	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	0.00293	0.00296	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	0.000458	0.000474	3.61%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00089	0.00090	0.000004	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 717310)											
CG2214660-001	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	<0.50	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 712946)											
FJ2202982-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0011	0.0010	0.0001	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00048	0.00048	0.000003	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0168	0.0173	3.31%	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	0.078	0.079	0.0008	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 712946) - continued											
FJ2202982-001	Anonymous	Calcium, dissolved	7440-70-2	E421	0.050	mg/L	110	110	0.509%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000056	0.000054	0.000001	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	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00024	0.00025	0.000008	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.136	0.138	1.23%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	141	146	3.01%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00010	<0.00010	0.000004	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00276	0.00268	2.87%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00874	0.00912	4.29%	20%	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.267	0.247	0.020	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.96	3.03	2.36%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00203	0.00206	1.31%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	121 µg/L	0.131	7.86%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.05	1.07	1.50%	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	22.2	22.1	0.720%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.764	0.764	0.0168%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	226	222	1.93%	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	0.000017	0.000018	0.0000004	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	0.00545	0.00560	2.60%	20%	----
		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	0.0115	0.0114	0.892%	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	0.0063	0.0068	0.0005	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: 715134)											
FJ2202978-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	0.50	ng/L	<0.50	<0.50	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 730278)											

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*
Speciated Metals (QC Lot: 730278) - continued											
FJ2202994-001	PD2-A	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 733465)											
FC2202619-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000060	0.000058	0.000002	Diff <2x LOR	----
Speciated Metals (QC Lot: 733968)											
FJ2202978-004	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 756854)											
FJ2202949-001	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.046	0.046	0.0002	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: 712518)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 712519)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 712528)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 714283)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 714302)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 712521)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 712522)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 712523)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 712524)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 712525)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 712527)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 712918)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 712919)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 712920)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 712921)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 713226)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 713227)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 713228)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 716357)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 712916)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 712917)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 713225)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 712956)						
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	MBRR
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 712956) - continued						
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 717310)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 712946)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 712946) - continued						
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 715134)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 730278)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733465)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733968)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 740379)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Speciated Metals (QCLot: 756854)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----

Qualifiers

Qualifier	Description
MBRR	*Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible*

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 712517)									
pH	----	E108	----	pH units	7 pH units	99.9	98.0	102	----
Physical Tests (QCLot: 712518)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	100	85.0	115	----
Physical Tests (QCLot: 712519)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.0	90.0	110	----
Physical Tests (QCLot: 712528)									
Colour, true	----	E329	5	CU	100 CU	100	85.0	115	----
Physical Tests (QCLot: 714283)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.3	85.0	115	----
Physical Tests (QCLot: 714302)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 712521)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 712522)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 712523)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 712524)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.5	90.0	110	----
Anions and Nutrients (QCLot: 712525)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 712527)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	103	80.0	120	----
Anions and Nutrients (QCLot: 712918)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 712919)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.8	80.0	120	----
Anions and Nutrients (QCLot: 712920)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	89.8	80.0	120	----
Anions and Nutrients (QCLot: 712921)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	103	85.0	115	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 713226)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 713227)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.0	80.0	120	----
Anions and Nutrients (QCLot: 713228)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	107	85.0	115	----
Anions and Nutrients (QCLot: 716357)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	106	85.0	115	----
Organic / Inorganic Carbon (QCLot: 712916)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	108	80.0	120	----
Organic / Inorganic Carbon (QCLot: 712917)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Organic / Inorganic Carbon (QCLot: 713225)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 712956)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	95.5	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	102	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	100.0	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	95.7	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	90.9	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.2	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.8	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	94.8	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	93.6	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	95.6	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	99.2	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.7	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	99.6	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	98.0	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	96.1	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	94.0	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 712956) - continued									
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	96.2	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	99.2	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100.0	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	99.5	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	92.9	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	99.4	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	99.8	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	89.9	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	95.6	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.7	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	97.2	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	89.7	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	95.9	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	96.7	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	91.4	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	97.6	80.0	120	----
Total Metals (QCLot: 717310)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	112	80.0	120	----
Dissolved Metals (QCLot: 712946)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.6	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	104	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	101	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	109	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.5	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.6	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	106	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.0	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	99.8	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	97.0	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 712946) - continued									
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	106	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.9	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.0	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	98.8	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.1	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	99.4	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	105	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	96.6	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	105	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	105	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	104	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	97.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.3	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	97.6	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	95.6	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	94.4	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	102	80.0	120	----
Speciated Metals (QCLot: 730278)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.5	70.0	130	----
Speciated Metals (QCLot: 733465)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	83.2	70.0	130	----
Speciated Metals (QCLot: 733968)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	79.0	70.0	130	----
Speciated Metals (QCLot: 740379)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.8	70.0	130	----
Speciated Metals (QCLot: 756854)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Speciated Metals (QCLot: 756854) - continued									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	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: 712521)										
FJ2203002-002	Anonymous	Fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 712522)										
FJ2203002-002	Anonymous	Chloride	16887-00-6	E235.Cl	100 mg/L	100 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 712523)										
FJ2203002-002	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: 712524)										
FJ2203002-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.490 mg/L	0.5 mg/L	98.1	75.0	125	----
Anions and Nutrients (QCLot: 712525)										
FJ2203002-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	98.1 mg/L	100 mg/L	98.1	75.0	125	----
Anions and Nutrients (QCLot: 712527)										
FJ2202994-002	PD2-B	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0311 mg/L	0.03 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 712918)										
FJ2202994-002	PD2-B	Nitrogen, total	7727-37-9	E366	0.384 mg/L	0.4 mg/L	96.1	70.0	130	----
Anions and Nutrients (QCLot: 712919)										
FJ2202994-002	PD2-B	Phosphorus, total	7723-14-0	E372-U	0.0514 mg/L	0.05 mg/L	103	70.0	130	----
Anions and Nutrients (QCLot: 712920)										
FJ2202994-002	PD2-B	Phosphorus, total dissolved	7723-14-0	E375-T	0.0478 mg/L	0.05 mg/L	95.7	70.0	130	----
Anions and Nutrients (QCLot: 712921)										
FJ2202994-002	PD2-B	Ammonia, total (as N)	7664-41-7	E298	0.111 mg/L	0.1 mg/L	111	75.0	125	----
Anions and Nutrients (QCLot: 713226)										
VA22C5507-001	Anonymous	Nitrogen, total	7727-37-9	E366	ND mg/L	2 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 713227)										
VA22C5405-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 713228)										
VA22C5405-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	MS-B
Anions and Nutrients (QCLot: 716357)										
EO2209213-022	Anonymous	Silicate (as SiO2)	7631-86-9	E392	ND mg/L	10 mg/L	ND	75.0	125	----

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
Organic / Inorganic Carbon (QCLot: 712916)										
FJ2202994-002	PD2-B	Carbon, dissolved organic [DOC]	----	E358-L	5.04 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 712917)										
FJ2202994-002	PD2-B	Carbon, total organic [TOC]	----	E355-L	4.95 mg/L	5 mg/L	99.0	70.0	130	----
Organic / Inorganic Carbon (QCLot: 713225)										
VA22C5405-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 712956)										
FJ2202994-002	PD2-B	Aluminum, total	7429-90-5	E420	0.185 mg/L	0.2 mg/L	92.6	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0406 mg/L	0.04 mg/L	102	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00981 mg/L	0.01 mg/L	98.1	70.0	130	----
		Boron, total	7440-42-8	E420	0.095 mg/L	0.1 mg/L	94.8	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0374 mg/L	0.04 mg/L	93.4	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0184 mg/L	0.02 mg/L	91.8	70.0	130	----
		Copper, total	7440-50-8	E420	0.0188 mg/L	0.02 mg/L	94.3	70.0	130	----
		Iron, total	7439-89-6	E420	1.84 mg/L	2 mg/L	92.1	70.0	130	----
		Lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0984 mg/L	0.1 mg/L	98.4	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.52 mg/L	10 mg/L	95.2	70.0	130	----
		Potassium, total	7440-09-7	E420	3.84 mg/L	4 mg/L	96.1	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	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		Silicon, total	7440-21-3	E420	9.10 mg/L	10 mg/L	91.0	70.0	130	----
		Silver, total	7440-22-4	E420	0.00415 mg/L	0.004 mg/L	104	70.0	130	----
		Sodium, total	7440-23-5	E420	1.91 mg/L	2 mg/L	95.6	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 712956) - continued										
FJ2202994-002	PD2-B	Sulfur, total	7704-34-9	E420	19.1 mg/L	20 mg/L	95.4	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0375 mg/L	0.04 mg/L	93.8	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00390 mg/L	0.004 mg/L	97.5	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0223 mg/L	0.02 mg/L	112	70.0	130	----
		Tin, total	7440-31-5	E420	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0358 mg/L	0.04 mg/L	89.5	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00419 mg/L	0.004 mg/L	105	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0966 mg/L	0.1 mg/L	96.6	70.0	130	----
		Zinc, total	7440-66-6	E420	0.360 mg/L	0.4 mg/L	90.1	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
Total Metals (QCLot: 717310)										
CG2214660-002	Anonymous	Mercury, total	7439-97-6	E508-L	4.87 ng/L	5 ng/L	97.4	70.0	130	----
Dissolved Metals (QCLot: 712946)										
FJ2202982-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.191 mg/L	0.2 mg/L	95.4	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00897 mg/L	0.01 mg/L	89.7	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.078 mg/L	0.1 mg/L	78.0	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00374 mg/L	0.004 mg/L	93.6	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0111 mg/L	0.01 mg/L	111	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0379 mg/L	0.04 mg/L	94.7	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0181 mg/L	0.02 mg/L	90.3	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.90 mg/L	2 mg/L	95.2	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0194 mg/L	0.02 mg/L	97.0	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0203 mg/L	0.02 mg/L	102	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0364 mg/L	0.04 mg/L	91.0	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.4 mg/L	10 mg/L	104	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: 712946) - continued										
FJ2202982-002	Anonymous	Potassium, dissolved	7440-09-7	E421	3.81 mg/L	4 mg/L	95.2	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0450 mg/L	0.04 mg/L	112	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.27 mg/L	10 mg/L	92.7	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00408 mg/L	0.004 mg/L	102	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00378 mg/L	0.004 mg/L	94.6	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0215 mg/L	0.02 mg/L	108	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.358 mg/L	0.4 mg/L	89.4	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
Dissolved Metals (QCLot: 715134)										
FJ2202978-002	Anonymous	Mercury, dissolved	7439-97-6	E509-L	5.35 ng/L	5 ng/L	107	70.0	130	----
Speciated Metals (QCLot: 730278)										
FJ2202994-002	PD2-B	Methylmercury (as MeHg), total	22967-92-6	E536	0.00216 µg/L	0.0025 µg/L	86.2	60.0	140	----
Speciated Metals (QCLot: 733465)										
FJ2202994-001	PD2-A	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00152 µg/L	0.0025 µg/L	61.0	60.0	140	----
Speciated Metals (QCLot: 733968)										
FJ2202994-003	PD5	Methylmercury (as MeHg), total	22967-92-6	E536	0.00175 µg/L	0.0025 µg/L	70.0	60.0	140	----
Speciated Metals (QCLot: 756854)										
FJ2202949-002	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.355 mg/L	0.5 mg/L	71.1	70.0	130	----

Qualifiers

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order # (ALS use only):

ALS Contact: Sean Zhang Sampler: Pat Beaupre

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	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L)	HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~BEA-A~~	~~17 OCT 22~~	~~17:00~~	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~BEA-B~~	—	—	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	PD2-A	20 OCT 22	13:05	Water	9	R	R	R	R	R	R	R	R	R	R			
	PD2-B	20 OCT 22	13:05	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~PINE~~	—	—	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	PD5	20 OCT 22	07:45	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~POND~~	~~17 OCT 22~~	~~11:45~~	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~BEA~~	~~17 OCT 22~~	~~13:10~~	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	~~KR~~	~~17 OCT 22~~	~~14:55~~	~~Water~~	~~9~~	R	R	R	R	R	R	R	R	R	R			
	PD3	20 OCT 22	11:40	Water	9	R	R	R	R	R	R	R	R	R	R			
	Travel Blank	20 OCT 22	✓	Water	5	R		R	R	R		R		R				

Fort St. John
Work Order Reference
FJ2202994

Telephone : +1 250 261 5517

FJAE Shipping & Receiving
Call Out ___ Expedite
___ Priority
2 # 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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	gmann@azimuthgroup.ca imcivor@azimuthgroup.ca
	csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
7°C	8.3°C			7.2°C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: 20 OCT 2022	Time:	Received by:	Date: 10-20-22	Time: 3:28	Received by:	Date: Oct 21	Time: 17:25

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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2203009**	Page	: 1 of 8
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day 2	Issue Date	: 25-Aug-2023 17:58
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	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*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PC1	PR1	PR2	HD	----
						Client sampling date / time	21-Oct-2022 08:40	21-Oct-2022 08:00	21-Oct-2022 13:45	21-Oct-2022 13:15	----
							FJ2203009-001	FJ2203009-002	FJ2203009-003	FJ2203009-004	--------
							Result	Result	Result	Result	----
Sample Preparation											
Dissolved Fe2 filtration location	----	EP541/VA		-	-		Field	Field	Field	Field	----
Physical Tests											
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		71.0	71.4	71.0	178	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	8.8	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L		71.0	71.4	71.0	186	----
Colour, true	----	E329/VA	A	5.0	CU		6.4	7.0	7.0	<5.0	----
Conductivity	----	E100/VA	A	2.0	µS/cm		174	175	176	470	----
Hardness (as CaCO3), dissolved	----	EC100/VA		0.50	mg/L		81.2	82.3	84.4	214	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA		0.50	mg/L		88.2	88.9	93.2	254	----
pH	----	E108/VA	A	0.10	pH units		8.07	8.09	8.11	8.41	----
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L		104	112	100	296	----
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L		<3.0	<3.0	<3.0	6.2	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L		0.0060	<0.0050	0.0231	0.0050	----
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L		<0.50	<0.50	<0.50	0.61	----
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L		0.037	0.036	0.035	0.099	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L		0.089	0.089	0.115	0.073	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L		0.0641	0.0640	0.0596	<0.0050	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L		0.153	0.153	0.175	0.073	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L		0.0042	0.0043	0.0066	0.0116	----
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L		<0.0020	<0.0020	<0.0020	<0.0020	----
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L		4.31	4.27	4.23	3.70	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L		11.8	12.0	12.0	57.7	----
Nitrate + Nitrite (as N)	----	EC235.N+N/VA		0.0032	mg/L		0.0641	0.0640	0.0596	<0.0051	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PC1	PR1	PR2	HD	----
						Client sampling date / time	21-Oct-2022 08:40	21-Oct-2022 08:00	21-Oct-2022 13:45	21-Oct-2022 13:15	----
							FJ2203009-001	FJ2203009-002	FJ2203009-003	FJ2203009-004	--------
							Result	Result	Result	Result	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L		2.77	2.87	2.83	2.50	----
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L		2.82	2.91	3.02	1.92	----
Ion Balance											
Anion sum	----	EC101/VA		0.10	meq/L		1.67	1.68	1.67	4.94	----
Cation sum	----	EC101/VA		0.10	meq/L		1.68	1.70	1.74	4.44	----
Ion balance (APHA)	----	EC101/VA		0.01	%		0.30	0.59	2.05	5.33	----
Total Metals											
Aluminum, total	7429-90-5	E420/VA	A	0.0030	mg/L		0.0432	0.0355	0.0574	0.222	----
Antimony, total	7440-36-0	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00018	----
Arsenic, total	7440-38-2	E420/VA	A	0.00010	mg/L		0.00020	0.00022	0.00021	0.00025	----
Barium, total	7440-39-3	E420/VA	A	0.00010	mg/L		0.0304	0.0314	0.0335	0.121	----
Beryllium, total	7440-41-7	E420/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
Bismuth, total	7440-69-9	E420/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Boron, total	7440-42-8	E420/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	0.014	----
Cadmium, total	7440-43-9	E420/VA	A	0.0000050	mg/L		0.0000128	0.0000163	0.0000175	0.0000272	----
Calcium, total	7440-70-2	E420/VA	A	0.050	mg/L		25.7	25.6	26.8	68.3	----
Cesium, total	7440-46-2	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	0.000042	----
Chromium, total	7440-47-3	E420/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Cobalt, total	7440-48-4	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00013	----
Copper, total	7440-50-8	E420/VA	A	0.00050	mg/L		0.00070	0.00072	0.00088	0.00058	----
Iron, total	7439-89-6	E420/VA	A	0.010	mg/L		0.036	0.046	0.074	0.248	----
Lead, total	7439-92-1	E420/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	0.000121	----
Lithium, total	7439-93-2	E420/VA	A	0.0010	mg/L		0.0011	0.0011	0.0012	0.0086	----
Magnesium, total	7439-95-4	E420/VA	A	0.0050	mg/L		5.83	6.06	6.37	20.2	----
Manganese, total	7439-96-5	E420/VA	A	0.00010	mg/L		0.00197	0.00208	0.00314	0.00863	----
Mercury, total	7439-97-6	E508-L/VA	A	0.50	ng/L		<0.50	<0.50	0.50	0.80	----
Molybdenum, total	7439-98-7	E420/VA	A	0.000050	mg/L		0.000802	0.000824	0.000889	0.00450	----
Nickel, total	7440-02-0	E420/VA	A	0.00050	mg/L		0.00080	0.00076	0.00084	0.00127	----
Phosphorus, total	7723-14-0	E420/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Potassium, total	7440-09-7	E420/VA	A	0.050	mg/L		0.429	0.439	0.474	0.792	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PC1	PR1	PR2	HD	----
						Client sampling date / time	21-Oct-2022 08:40	21-Oct-2022 08:00	21-Oct-2022 13:45	21-Oct-2022 13:15	----
							FJ2203009-001	FJ2203009-002	FJ2203009-003	FJ2203009-004	--------
							Result	Result	Result	Result	----
Total Metals											
Rubidium, total	7440-17-7	E420/VA	A	0.00020	mg/L		0.00038	0.00039	0.00044	0.00072	----
Selenium, total	7782-49-2	E420/VA	A	0.000050	mg/L		0.000249	0.000253	0.000240	0.00140	----
Silicon, total	7440-21-3	E420/VA	A	0.10	mg/L		2.13	2.24	2.25	2.36	----
Silver, total	7440-22-4	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, total	7440-23-5	E420/VA	A	0.050	mg/L		1.03	1.04	1.14	3.69	----
Strontium, total	7440-24-6	E420/VA	A	0.00020	mg/L		0.102	0.105	0.110	0.405	----
Sulfur, total	7704-34-9	E420/VA	A	0.50	mg/L		4.46	4.55	4.69	23.2	----
Tellurium, total	13494-80-9	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Thallium, total	7440-28-0	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Thorium, total	7440-29-1	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Tin, total	7440-31-5	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Titanium, total	7440-32-6	E420/VA	A	0.00030	mg/L		0.00074	0.00082	0.00132	<0.00600 DLM	----
Tungsten, total	7440-33-7	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Uranium, total	7440-61-1	E420/VA	A	0.000010	mg/L		0.000423	0.000420	0.000444	0.000962	----
Vanadium, total	7440-62-2	E420/VA	A	0.00050	mg/L		<0.00050	<0.00050	0.00054	0.00106	----
Zinc, total	7440-66-6	E420/VA	A	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	----
Zirconium, total	7440-67-7	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	0.00025	----
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	A	0.0010	mg/L		0.0046	0.0046	0.0040	0.0020	----
Antimony, dissolved	7440-36-0	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00014	----
Arsenic, dissolved	7440-38-2	E421/VA	A	0.00010	mg/L		0.00016	0.00018	0.00018	0.00014	----
Barium, dissolved	7440-39-3	E421/VA	A	0.00010	mg/L		0.0294	0.0291	0.0300	0.103	----
Beryllium, dissolved	7440-41-7	E421/VA	A	0.000020	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	----
Bismuth, dissolved	7440-69-9	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Boron, dissolved	7440-42-8	E421/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	0.010	----
Cadmium, dissolved	7440-43-9	E421/VA	A	0.0000050	mg/L		0.0000070	0.0000079	0.0000084	0.0000055	----
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L		23.6	23.7	24.4	55.8	----
Cesium, dissolved	7440-46-2	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Chromium, dissolved	7440-47-3	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Cobalt, dissolved	7440-48-4	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PC1	PR1	PR2	HD	----
						Client sampling date / time	21-Oct-2022 08:40	21-Oct-2022 08:00	21-Oct-2022 13:45	21-Oct-2022 13:15	----
							FJ2203009-001	FJ2203009-002	FJ2203009-003	FJ2203009-004	--------
							Result	Result	Result	Result	----
Dissolved Metals											
Copper, dissolved	7440-50-8	E421/VA	A	0.00020	mg/L		0.00056	0.00057	0.00056	0.00033	----
Iron, dissolved	7439-89-6	E421/VA	A	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Lead, dissolved	7439-92-1	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	----
Lithium, dissolved	7439-93-2	E421/VA	A	0.0010	mg/L		<0.0010	<0.0010	0.0010	0.0070	----
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L		5.42	5.62	5.69	18.2	----
Manganese, dissolved	7439-96-5	E421/VA	A	0.00010	mg/L		0.00045	0.00045	0.00038	0.00249	----
Mercury, dissolved	7439-97-6	E509-L/VA	A	0.50	ng/L		<0.50	<0.50	<0.50	<0.50	----
Molybdenum, dissolved	7439-98-7	E421/VA	A	0.000050	mg/L		0.000740	0.000701	0.000732	0.00368	----
Nickel, dissolved	7440-02-0	E421/VA	A	0.00050	mg/L		0.00061	0.00062	0.00061	0.00083	----
Phosphorus, dissolved	7723-14-0	E421/VA	A	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Potassium, dissolved	7440-09-7	E421/VA	A	0.050	mg/L		0.406	0.407	0.416	0.660	----
Rubidium, dissolved	7440-17-7	E421/VA	A	0.00020	mg/L		0.00029	0.00030	0.00030	0.00027	----
Selenium, dissolved	7782-49-2	E421/VA	A	0.000050	mg/L		0.000218	0.000251	0.000187	0.00122	----
Silicon, dissolved	7440-21-3	E421/VA	A	0.050	mg/L		2.03	1.98	1.94	1.74	----
Silver, dissolved	7440-22-4	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Sodium, dissolved	7440-23-5	E421/VA	A	0.050	mg/L		0.970	0.954	0.985	3.36	----
Strontium, dissolved	7440-24-6	E421/VA	A	0.00020	mg/L		0.0944	0.0936	0.0970	0.330	----
Sulfur, dissolved	7704-34-9	E421/VA	A	0.50	mg/L		4.05	4.05	3.93	20.5	----
Tellurium, dissolved	13494-80-9	E421/VA	A	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	----
Thallium, dissolved	7440-28-0	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	----
Thorium, dissolved	7440-29-1	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Tin, dissolved	7440-31-5	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Titanium, dissolved	7440-32-6	E421/VA	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
Tungsten, dissolved	7440-33-7	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	----
Uranium, dissolved	7440-61-1	E421/VA	A	0.000010	mg/L		0.000388	0.000384	0.000382	0.000763	----
Vanadium, dissolved	7440-62-2	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	----
Zinc, dissolved	7440-66-6	E421/VA	A	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	----
Zirconium, dissolved	7440-67-7	E421/VA	A	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	----
Dissolved MeHg filtration location	----	EP537/VA		-	-		Field	Field	Field	Field	----
Dissolved mercury filtration location	----	EP509-L/VA		-	-		Field	Field	Field	Field	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PC1	PR1	PR2	HD	----
					Client sampling date / time	21-Oct-2022 08:40	21-Oct-2022 08:00	21-Oct-2022 13:45	21-Oct-2022 13:15	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2203009-001	FJ2203009-002	FJ2203009-003	FJ2203009-004	--------
						Result	Result	Result	Result	----
Dissolved Metals										
Dissolved metals filtration location	----	EP421/VA		-	-	Field	Field	Field	Field	----
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	<0.000000020	<0.000000020	----
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	A	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	<0.000000020	<0.000000020	----

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	: **FJ2203009**	Page	: 1 of 22
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:59
C-O-C number	: 2022-Oct-MON8/9-Day 2		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) HD	E298	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR2	E298	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PC1	E298	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PR1	E298	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE HD	E235.Cl	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PC1	E235.Cl	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PR2	E235.Cl	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
HDPE PR1	E235.Cl	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE HD	E378-U	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR2	E378-U	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	4 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PC1	E378-U	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PR1	E378-U	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Anions and Nutrients : Fluoride in Water by IC										
HDPE HD	E235.F	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PC1	E235.F	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR2	E235.F	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PR1	E235.F	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE HD	E235.NO3-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PC1	E235.NO3-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR2	E235.NO3-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PR1	E235.NO3-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	5 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE HD	E235.NO2-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PC1	E235.NO2-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR2	E235.NO2-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	4 days	✗ EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PR1	E235.NO2-L	21-Oct-2022	25-Oct-2022	3 days	4 days	✗ EHT	25-Oct-2022	3 days	5 days	✗ EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE HD	E392	21-Oct-2022	----	----	----		26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PC1	E392	21-Oct-2022	----	----	----		26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR1	E392	21-Oct-2022	----	----	----		26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PR2	E392	21-Oct-2022	----	----	----		26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE HD	E235.SO4	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PC1	E235.SO4	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR2	E235.SO4	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PR1	E235.SO4	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) HD	E375-T	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR2	E375-T	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PC1	E375-T	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) PR1	E375-T	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) HD	E366	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR2	E366	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PC1	E366	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) PR1	E366	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) HD	E372-U	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR2	E372-U	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PC1	E372-U	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) PR1	E372-U	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) HD	E509-L	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PC1	E509-L	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR1	E509-L	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved) PR2	E509-L	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	28 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR2	E421	21-Oct-2022	29-Oct-2022	180 days	7 days	✓	29-Oct-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) HD	E421	21-Oct-2022	29-Oct-2022	180 days	8 days	✓	29-Oct-2022	180 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PC1	E421	21-Oct-2022	29-Oct-2022	180 days	8 days	✓	29-Oct-2022	180 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PR1	E421	21-Oct-2022	29-Oct-2022	180 days	8 days	✓	29-Oct-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) HD	E358-L	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR2	E358-L	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PC1	E358-L	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PR1	E358-L	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) HD	E355-L	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR2	E355-L	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PC1	E355-L	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PR1	E355-L	21-Oct-2022	25-Oct-2022	28 days	5 days	✓	26-Oct-2022	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Alkalinity Species by Titration										
HDPE HD	E290	21-Oct-2022	25-Oct-2022	14 days	4 days	✓	25-Oct-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR2	E290	21-Oct-2022	25-Oct-2022	14 days	4 days	✓	25-Oct-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PC1	E290	21-Oct-2022	25-Oct-2022	14 days	4 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PR1	E290	21-Oct-2022	25-Oct-2022	14 days	4 days	✓	25-Oct-2022	14 days	5 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE HD	E329	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	4 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR2	E329	21-Oct-2022	25-Oct-2022	3 days	4 days	× EHT	25-Oct-2022	3 days	4 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PC1	E329	21-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE PR1	E329	21-Oct-2022	25-Oct-2022	3 days	5 days	× EHT	25-Oct-2022	3 days	5 days	× EHT
Physical Tests : Conductivity in Water										
HDPE HD	E100	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Conductivity in Water										
HDPE PR2	E100	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE PC1	E100	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE PR1	E100	21-Oct-2022	25-Oct-2022	28 days	4 days	✓	25-Oct-2022	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE HD	E108	21-Oct-2022	25-Oct-2022	0.25 hrs	101 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	105 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR2	E108	21-Oct-2022	25-Oct-2022	0.25 hrs	101 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	105 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PC1	E108	21-Oct-2022	25-Oct-2022	0.25 hrs	106 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	110 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PR1	E108	21-Oct-2022	25-Oct-2022	0.25 hrs	107 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	111 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE HD	E162	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PC1	E162	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 PR1	E162	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE PR2	E162	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE HD	E160	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PC1	E160	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR1	E160	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PR2	E160	21-Oct-2022	----	----	----		25-Oct-2022	7 days	4 days	✓
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) HD	E541	21-Oct-2022	24-Nov-2022	7 days	34 days	× EHT	24-Nov-2022	7 days	34 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PC1	E541	21-Oct-2022	24-Nov-2022	7 days	34 days	× EHT	24-Nov-2022	7 days	34 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PR1	E541	21-Oct-2022	24-Nov-2022	7 days	34 days	× EHT	24-Nov-2022	7 days	34 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PR2	E541	21-Oct-2022	24-Nov-2022	7 days	34 days	× EHT	24-Nov-2022	7 days	34 days	× EHT
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) HD	E537	21-Oct-2022	07-Nov-2022	180 days	17 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PC1	E537	21-Oct-2022	07-Nov-2022	180 days	17 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PR1	E537	21-Oct-2022	07-Nov-2022	180 days	17 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PR2	E537	21-Oct-2022	07-Nov-2022	180 days	17 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) HD	E536	21-Oct-2022	05-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	17 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PC1	E536	21-Oct-2022	05-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	17 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR1	E536	21-Oct-2022	05-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	17 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PR2	E536	21-Oct-2022	05-Nov-2022	180 days	15 days	✓	07-Nov-2022	180 days	17 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) HD	E508-L	21-Oct-2022	27-Oct-2022	28 days	6 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PC1	E508-L	21-Oct-2022	27-Oct-2022	28 days	6 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR1	E508-L	21-Oct-2022	27-Oct-2022	28 days	6 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PR2	E508-L	21-Oct-2022	27-Oct-2022	28 days	6 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) HD	E420	21-Oct-2022	27-Oct-2022	180 days	6 days	✓	28-Oct-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PC1	E420	21-Oct-2022	27-Oct-2022	180 days	6 days	✓	28-Oct-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR1	E420	21-Oct-2022	27-Oct-2022	180 days	6 days	✓	28-Oct-2022	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PR2	E420	21-Oct-2022	27-Oct-2022	180 days	6 days	✓	28-Oct-2022	180 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	714265	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	714669	1	10	10.0	5.0	✓
Chloride in Water by IC	E235.Cl	714269	1	4	25.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714273	1	4	25.0	5.0	✓
Conductivity in Water	E100	714266	1	5	20.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	718309	1	15	6.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714670	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714263	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	714268	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714270	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714271	1	4	25.0	5.0	✓
pH by Meter	E108	714264	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714272	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	714672	1	5	20.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	718376	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	714046	1	19	5.2	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	714668	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714671	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714673	1	5	20.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	714265	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	714669	1	10	10.0	5.0	✓
Chloride in Water by IC	E235.Cl	714269	1	4	25.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714273	1	4	25.0	5.0	✓
Conductivity in Water	E100	714266	1	5	20.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	718309	1	15	6.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714670	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714263	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	714268	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714270	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714271	1	4	25.0	5.0	✓
pH by Meter	E108	714264	1	19	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714272	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	714672	1	5	20.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	718376	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	714046	1	19	5.2	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	714668	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714671	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714673	1	5	20.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	714265	1	19	5.2	5.0	✓
Ammonia by Fluorescence	E298	714669	1	10	10.0	5.0	✓
Chloride in Water by IC	E235.Cl	714269	1	4	25.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714273	1	4	25.0	5.0	✓
Conductivity in Water	E100	714266	1	5	20.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	718309	1	15	6.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714670	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714263	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	714268	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714270	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714271	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714272	1	5	20.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	714672	1	5	20.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	718376	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	714046	1	19	5.2	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	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*
Method Blanks (MB) - Continued							
Total Nitrogen by Colourimetry	E366	714668	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714671	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714673	1	5	20.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	714669	1	10	10.0	5.0	✓
Chloride in Water by IC	E235.Cl	714269	1	4	25.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756854	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	718309	1	15	6.6	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	714670	1	5	20.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714263	1	19	5.2	5.0	✓
Fluoride in Water by IC	E235.F	714268	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714270	1	5	20.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714271	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714272	1	5	20.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	714672	1	5	20.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	718376	1	10	10.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	714046	1	19	5.2	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	714668	1	10	10.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	714671	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	714673	1	5	20.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
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.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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 (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2203009**	Page	: 1 of 18
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day 2	Issue Date	: 25-Aug-2023 17:59
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Sukhman Khosa	Lab Assistant	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: 714264)											
FJ2203009-001	PC1	pH	----	E108	0.10	pH units	8.07	8.10	0.371%	4%	----
Physical Tests (QC Lot: 714265)											
FJ2203009-001	PC1	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	71.0	71.6	0.823%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	71.0	71.6	0.823%	20%	----
Physical Tests (QC Lot: 714266)											
FJ2203009-001	PC1	Conductivity	----	E100	2.0	µS/cm	174	176	0.685%	10%	----
Physical Tests (QC Lot: 714273)											
FJ2203009-001	PC1	Colour, true	----	E329	5.0	CU	6.4	5.9	0.5	Diff <2x LOR	----
Physical Tests (QC Lot: 714283)											
FJ2202955-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 714302)											
FJ2202955-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	318	305	4.18%	20%	----
Anions and Nutrients (QC Lot: 714263)											
FJ2203009-001	PC1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714268)											
FJ2203009-001	PC1	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.037	0.036	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714269)											
FJ2203009-001	PC1	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714270)											
FJ2203009-001	PC1	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0641	0.0641	0.0796%	20%	----
Anions and Nutrients (QC Lot: 714271)											
FJ2203009-001	PC1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714272)											
FJ2203009-001	PC1	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	11.8	11.8	0.176%	20%	----
Anions and Nutrients (QC Lot: 714668)											
FJ2203009-001	PC1	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.153	0.151	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714669)											
FJ2203009-001	PC1	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0060	0.0055	0.0005	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*
Anions and Nutrients (QC Lot: 714672)											
FJ2203009-001	PC1	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714673)											
FJ2203009-001	PC1	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0042	0.0049	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 716537)											
EO2209213-024	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 714670)											
FJ2203009-001	PC1	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.77	2.85	0.08	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 714671)											
FJ2203009-001	PC1	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.82	3.11	0.29	Diff <2x LOR	----
Total Metals (QC Lot: 714046)											
FJ2203009-001	PC1	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0432	0.0523	18.9%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00020	0.00023	0.00002	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0304	0.0314	3.17%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000128	0.0000122	0.0000006	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	25.7	25.0	2.70%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00070	0.00069	0.000004	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.036	0.035	0.001	Diff <2x LOR	----
		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	0.0011	0.0010	0.00002	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	5.83	6.08	4.06%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00197	0.00195	1.01%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000802	0.000801	0.0734%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00080	0.00074	0.00006	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.429	0.439	0.010	Diff <2x LOR	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00038	0.00041	0.00003	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000249	0.000275	0.000026	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: 714046) - continued											
FJ2203009-001	PC1	Silicon, total	7440-21-3	E420	0.10	mg/L	2.13	2.21	3.97%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	1.03	1.06	2.55%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.102	0.107	4.48%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	4.46	4.74	0.28	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	0.00074	0.00052	0.00022	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	0.000423	0.000428	1.06%	20%	----
		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	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 718376)											
EO2208940-001	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	2.02	1.86	0.16	Diff <2x LOR	----
Dissolved Metals (QC Lot: 718309)											
FJ2203009-001	PC1	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0046	0.0048	0.0002	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00016	0.00017	0.000004	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0294	0.0290	1.20%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000070	0.0000087	0.0000017	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	23.6	23.4	0.639%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00056	0.00057	0.000010	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----

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: 718309) - continued											
FJ2203009-001	PC1	Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.42	5.63	3.86%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00045	0.00043	0.00002	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000740	0.000722	2.42%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00061	0.00063	0.00001	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.406	0.405	0.0007	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00029	0.00034	0.00005	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000218	0.000144	0.000074	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.03	1.96	3.64%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.970	0.960	0.964%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0944	0.0947	0.289%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	4.05	3.80	0.24	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	0.000388	0.000378	2.56%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 719532)											
EO2208953-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	1.00	ng/L	<1.00	<1.00	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 730278)											
FJ2202994-001	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 733465)											
FC2202619-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000060	0.000058	0.000002	Diff <2x LOR	----
Speciated Metals (QC Lot: 733968)											
FJ2202978-004	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 756854)											
FJ2202949-001	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	0.046	0.046	0.0002	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: 714265)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 714266)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 714273)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 714283)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 714302)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 714263)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 714268)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 714269)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 714270)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 714271)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 714272)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 714668)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 714669)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 714672)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 714673)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 714673) - continued						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 716537)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 714670)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 714671)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 714046)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 714046) - continued						
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
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: 718376)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 718309)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 718309) - continued						
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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: 719532)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Speciated Metals (QCLot: 730278)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733465)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733968)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 756854)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 714264)									
pH	----	E108	----	pH units	7 pH units	99.8	98.0	102	----
Physical Tests (QCLot: 714265)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 714266)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 714273)									
Colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 714283)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.3	85.0	115	----
Physical Tests (QCLot: 714302)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 714263)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	97.1	80.0	120	----
Anions and Nutrients (QCLot: 714268)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 714269)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 714270)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 714271)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	99.8	90.0	110	----
Anions and Nutrients (QCLot: 714272)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 714668)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 714669)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 714672)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	91.9	80.0	120	----
Anions and Nutrients (QCLot: 714673)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	91.0	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 716537)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	105	85.0	115	----
Organic / Inorganic Carbon (QCLot: 714670)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	101	80.0	120	----
Organic / Inorganic Carbon (QCLot: 714671)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 714046)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	101	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	104	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	106	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	99.9	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	100	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	100	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	106	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.2	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.6	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	105	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	102	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	99.1	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	106	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	98.6	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	103	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	109	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 714046) - continued									
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	102	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	101	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	99.1	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.2	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	93.8	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	103	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.6	80.0	120	----
Total Metals (QCLot: 718376)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	100	80.0	120	----
Dissolved Metals (QCLot: 718309)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	97.4	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	100	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	94.1	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	94.8	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	89.2	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.3	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	94.7	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	101	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	94.3	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	94.3	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	94.1	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	96.8	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	92.9	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	97.2	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.6	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	94.9	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	101	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 718309) - continued									
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.3	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.2	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	95.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	80.4	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.9	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	93.1	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.2	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	93.8	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	92.3	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	96.8	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.6	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	94.4	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	100	80.0	120	----
Speciated Metals (QCLot: 730278)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.5	70.0	130	----
Speciated Metals (QCLot: 733465)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	83.2	70.0	130	----
Speciated Metals (QCLot: 733968)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	79.0	70.0	130	----
Speciated Metals (QCLot: 756854)									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	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: 714263)										
FJ2203009-002	PR1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0315 mg/L	0.03 mg/L	105	70.0	130	----
Anions and Nutrients (QCLot: 714268)										
FJ2203009-002	PR1	Fluoride	16984-48-8	E235.F	0.991 mg/L	1 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 714269)										
FJ2203009-002	PR1	Chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 714270)										
FJ2203009-002	PR1	Nitrate (as N)	14797-55-8	E235.NO3-L	2.59 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 714271)										
FJ2203009-002	PR1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.503 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 714272)										
FJ2203009-002	PR1	Sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 714668)										
FJ2203009-002	PR1	Nitrogen, total	7727-37-9	E366	0.394 mg/L	0.4 mg/L	98.5	70.0	130	----
Anions and Nutrients (QCLot: 714669)										
FJ2203009-002	PR1	Ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 714672)										
FJ2203009-002	PR1	Phosphorus, total dissolved	7723-14-0	E375-T	0.0438 mg/L	0.05 mg/L	87.6	70.0	130	----
Anions and Nutrients (QCLot: 714673)										
FJ2203009-002	PR1	Phosphorus, total	7723-14-0	E372-U	0.0443 mg/L	0.05 mg/L	88.7	70.0	130	----
Anions and Nutrients (QCLot: 716537)										
EO2209213-025	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.41 mg/L	10 mg/L	94.1	75.0	125	----
Organic / Inorganic Carbon (QCLot: 714670)										
FJ2203009-002	PR1	Carbon, dissolved organic [DOC]	----	E358-L	5.03 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 714671)										
FJ2203009-002	PR1	Carbon, total organic [TOC]	----	E355-L	5.07 mg/L	5 mg/L	101	70.0	130	----
Total Metals (QCLot: 714046)										
FJ2203009-002	PR1	Aluminum, total	7429-90-5	E420	0.186 mg/L	0.2 mg/L	92.8	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: 714046) - continued										
FJ2203009-002	PR1	Antimony, total	7440-36-0	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00959 mg/L	0.01 mg/L	95.9	70.0	130	----
		Boron, total	7440-42-8	E420	0.098 mg/L	0.1 mg/L	97.7	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00396 mg/L	0.004 mg/L	99.0	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0105 mg/L	0.01 mg/L	105	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0396 mg/L	0.04 mg/L	99.1	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		Copper, total	7440-50-8	E420	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		Iron, total	7439-89-6	E420	1.93 mg/L	2 mg/L	96.4	70.0	130	----
		Lead, total	7439-92-1	E420	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0937 mg/L	0.1 mg/L	93.7	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0379 mg/L	0.04 mg/L	94.7	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.5 mg/L	10 mg/L	105	70.0	130	----
		Potassium, total	7440-09-7	E420	3.90 mg/L	4 mg/L	97.5	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0403 mg/L	0.04 mg/L	101	70.0	130	----
		Silicon, total	7440-21-3	E420	9.73 mg/L	10 mg/L	97.3	70.0	130	----
		Silver, total	7440-22-4	E420	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		Sodium, total	7440-23-5	E420	1.96 mg/L	2 mg/L	97.9	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	20.8 mg/L	20 mg/L	104	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00367 mg/L	0.004 mg/L	91.7	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Tin, total	7440-31-5	E420	0.0197 mg/L	0.02 mg/L	98.7	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0182 mg/L	0.02 mg/L	90.8	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 714046) - continued										
FJ2203009-002	PR1	Vanadium, total	7440-62-2	E420	0.0981 mg/L	0.1 mg/L	98.1	70.0	130	----
		Zinc, total	7440-66-6	E420	0.396 mg/L	0.4 mg/L	99.0	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
Total Metals (QCLot: 718376)										
EO2208940-002	Anonymous	Mercury, total	7439-97-6	E508-L	4.35 ng/L	5 ng/L	87.0	70.0	130	----
Dissolved Metals (QCLot: 718309)										
FJ2203009-002	PR1	Aluminum, dissolved	7429-90-5	E421	0.187 mg/L	0.2 mg/L	93.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0192 mg/L	0.02 mg/L	96.3	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0187 mg/L	0.02 mg/L	93.4	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00854 mg/L	0.01 mg/L	85.4	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.091 mg/L	0.1 mg/L	90.7	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00379 mg/L	0.004 mg/L	94.8	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00975 mg/L	0.01 mg/L	97.5	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0366 mg/L	0.04 mg/L	91.5	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0181 mg/L	0.02 mg/L	90.7	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0181 mg/L	0.02 mg/L	90.4	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.80 mg/L	2 mg/L	90.0	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0183 mg/L	0.02 mg/L	91.5	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0911 mg/L	0.1 mg/L	91.1	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0188 mg/L	0.02 mg/L	93.8	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0365 mg/L	0.04 mg/L	91.2	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.0 mg/L	10 mg/L	100	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.78 mg/L	4 mg/L	94.5	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0192 mg/L	0.02 mg/L	96.3	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0400 mg/L	0.04 mg/L	99.9	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.36 mg/L	10 mg/L	93.6	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	1.91 mg/L	2 mg/L	95.4	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	20.1 mg/L	20 mg/L	100	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 718309) - continued										
FJ2203009-002	PR1	Tellurium, dissolved	13494-80-9	E421	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00358 mg/L	0.004 mg/L	89.6	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0188 mg/L	0.02 mg/L	93.8	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0374 mg/L	0.04 mg/L	93.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0178 mg/L	0.02 mg/L	88.8	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00372 mg/L	0.004 mg/L	93.0	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	0.375 mg/L	0.4 mg/L	93.7	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0383 mg/L	0.04 mg/L	95.9	70.0	130	----
Dissolved Metals (QCLot: 719532)										
FC2202541-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	4.48 ng/L	5 ng/L	89.6	70.0	130	----
Speciated Metals (QCLot: 730278)										
FJ2202994-002	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00216 µg/L	0.0025 µg/L	86.2	60.0	140	----
Speciated Metals (QCLot: 733465)										
FJ2202994-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00152 µg/L	0.0025 µg/L	61.0	60.0	140	----
Speciated Metals (QCLot: 733968)										
FJ2202994-003	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00175 µg/L	0.0025 µg/L	70.0	60.0	140	----
Speciated Metals (QCLot: 756854)										
FJ2202949-002	Anonymous	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.355 mg/L	0.5 mg/L	71.1	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

Intact: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
						F/P	P			F		F		F				
	PC1	21-Oct-22	8:40	Water	9	R	R	R	R	R	R	R	R	R				
	PR1	21-Oct-22	8:00	Water	9	R	R	R	R	R	R	R	R	R				
	PR2	21-Oct-22	13:45	Water	9	R	R	R	R	R	R	R	R	R				
	HD	21-Oct-22	13:15	Water	9	R	R	R	R	R	R	R	R	R				
	~~DUP-01~~			~~Water~~	9	R	R	R	R	R	R	R	R	R				

Fort St. John Work Order Reference FJ2203009

Telephone : +1 250 261 5517

FJAE Shipping & Receiving
Call Out Expedite
Priority
1 # of Coolers Air
# of Carboys Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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
5.9	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
[illegible]	Oct 22/22	1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

ALS Lab Work Order # (ALS use only):

Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P (F/P)	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P (P)	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L) (F)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness (F)	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L) (F)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PC1	21-Oct-22	8:40	Water	9	R	R	R	R	R	R	R	R	R	R			
	PR1	21-Oct-22	8:00	Water	9	R	R	R	R	R	R	R	R	R	R			
	PR2	21-Oct-22	13:45	Water	9	R	R	R	R	R	R	R	R	R	R			
	HD	21-Oct-22	13:15	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~[illegible]~~			~~Water~~	9	R	R	R	R	R	R	R	R	R	R			

Fort St. John
Work Order Reference
FJ2203009

Telephone : +1 250 261 5517

FJAE Shipping & Receiving

___ Call Out ___ Expedite

___ Priority

1 # of Coolers ✓ Air

___ # of Carboys ___ Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
5.9				9°C [Avg]			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
[illegible]	21/10/22	1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
MeK	10/24/22	1115

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.

A-M

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2203012**	Page	: 1 of 8
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day 4	Issue Date	: 25-Aug-2023 17:59
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	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*
-	no units
%	percent
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
ng/L	nanograms per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	VA ALS Environmental - Vancouver	8081 Lougheed Highway, Burnaby, BC

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (07/12/2022): This report has been amended and re-released to allow the reporting of additional analytical data.

Amendment (25/8/2023): This report has been amended following holding time evaluation corrections. All analysis results are as per the previous report.

Qualifiers

Qualifier	Description
RRV	Reported result verified by repeat analysis.

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID: PDI	Pine	----	----	----
						Client sampling date / time: 22-Oct-2022 09:10	22-Oct-2022 11:10	----	----	----
						FJ2203012-001	FJ2203012-002	--------	--------	--------
						Result	Result	----	----	----
Sample Preparation										
Dissolved Fe2 filtration location	----	EP541/VA		-	-	Field	Field	----	----	----
Physical Tests										
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L	73.8	142	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	A	1.0	mg/L	<1.0	7.2	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	A	1.0	mg/L	<1.0	<1.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	A	1.0	mg/L	73.8	150	----	----	----
Colour, true	----	E329/VA	A	5.0	CU	6.1	<5.0	----	----	----
Conductivity	----	E100/VA	A	2.0	µS/cm	183	352	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA		0.50	mg/L	95.1	188	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA		0.50	mg/L	98.1	192	----	----	----
pH	----	E108/VA	A	0.10	pH units	8.17	8.43	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	A	10	mg/L	106	220	----	----	----
Solids, total suspended [TSS]	----	E160/VA	A	3.0	mg/L	<3.0	<3.0	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	A	0.0050	mg/L	0.0120	<0.0050	----	----	----
Chloride	16887-00-6	E235.Cl/VA	A	0.50	mg/L	<0.50	1.64	----	----	----
Fluoride	16984-48-8	E235.F/VA	A	0.020	mg/L	0.040	0.073	----	----	----
Kjeldahl nitrogen, total [TKN]	----	EC318/VA		0.050	mg/L	0.132	0.082	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	A	0.0050	mg/L	0.0615	<0.0050	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	A	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Nitrogen, total	7727-37-9	E366/VA	A	0.030	mg/L	0.193	0.082	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	A	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	A	0.0020	mg/L	0.0084	0.0040	----	----	----
Phosphorus, total dissolved	7723-14-0	E375-T/VA	A	0.0020	mg/L	0.0023 RRV	<0.0020	----	----	----
Silicate (as SiO2)	7631-86-9	E392/VA	A	0.50	mg/L	4.06	2.59	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	A	0.30	mg/L	12.9	28.5	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/VA		0.0032	mg/L	0.0615	<0.0051	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PDI	Pine	----	----	----
					Client sampling date / time	22-Oct-2022 09:10	22-Oct-2022 11:10	----	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2203012-001	FJ2203012-002	--------	--------	--------
						Result	Result	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	A	0.50	mg/L	2.57	1.28	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	A	0.50	mg/L	2.90	1.50	----	----	----
Ion Balance										
Anion sum	----	EC101/VA		0.10	meq/L	1.75	3.64	----	----	----
Cation sum	----	EC101/VA		0.10	meq/L	1.96	3.98	----	----	----
Ion balance (APHA)	----	EC101/VA		0.01	%	5.66	4.46	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	A	0.0030	mg/L	0.0887	0.0499	----	----	----
Antimony, total	7440-36-0	E420/VA	A	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Arsenic, total	7440-38-2	E420/VA	A	0.00010	mg/L	0.00028	0.00020	----	----	----
Barium, total	7440-39-3	E420/VA	A	0.00010	mg/L	0.0373	0.129	----	----	----
Beryllium, total	7440-41-7	E420/VA	A	0.000020	mg/L	<0.000020	<0.000020	----	----	----
Bismuth, total	7440-69-9	E420/VA	A	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Boron, total	7440-42-8	E420/VA	A	0.010	mg/L	<0.010	0.012	----	----	----
Cadmium, total	7440-43-9	E420/VA	A	0.0000050	mg/L	0.0000211	0.0000084	----	----	----
Calcium, total	7440-70-2	E420/VA	A	0.050	mg/L	28.1	53.0	----	----	----
Cesium, total	7440-46-2	E420/VA	A	0.000010	mg/L	0.000017	<0.000010	----	----	----
Chromium, total	7440-47-3	E420/VA	A	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Cobalt, total	7440-48-4	E420/VA	A	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Copper, total	7440-50-8	E420/VA	A	0.00050	mg/L	0.00081	<0.00050	----	----	----
Iron, total	7439-89-6	E420/VA	A	0.010	mg/L	0.104	0.091	----	----	----
Lead, total	7439-92-1	E420/VA	A	0.000050	mg/L	0.000058	<0.000050	----	----	----
Lithium, total	7439-93-2	E420/VA	A	0.0010	mg/L	0.0014	0.0088	----	----	----
Magnesium, total	7439-95-4	E420/VA	A	0.0050	mg/L	6.78	14.5	----	----	----
Manganese, total	7439-96-5	E420/VA	A	0.00010	mg/L	0.00412	0.00268	----	----	----
Mercury, total	7439-97-6	E508-L/VA	A	0.50	ng/L	<0.50	<0.50	----	----	----
Molybdenum, total	7439-98-7	E420/VA	A	0.000050	mg/L	0.000863	0.00106	----	----	----
Nickel, total	7440-02-0	E420/VA	A	0.00050	mg/L	0.00095	0.00064	----	----	----
Phosphorus, total	7723-14-0	E420/VA	A	0.050	mg/L	<0.050	<0.050	----	----	----
Potassium, total	7440-09-7	E420/VA	A	0.050	mg/L	0.508	0.705	----	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PDI	Pine	----	----	----
						Client sampling date / time	22-Oct-2022 09:10	22-Oct-2022 11:10	----	----	----
							FJ2203012-001	FJ2203012-002	--------	--------	--------
							Result	Result	----	----	----
Total Metals											
Rubidium, total	7440-17-7	E420/VA	A	0.00020	mg/L		0.00053	0.00038	----	----	----
Selenium, total	7782-49-2	E420/VA	A	0.000050	mg/L		0.000240	0.000374	----	----	----
Silicon, total	7440-21-3	E420/VA	A	0.10	mg/L		2.09	1.34	----	----	----
Silver, total	7440-22-4	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Sodium, total	7440-23-5	E420/VA	A	0.050	mg/L		1.24	4.58	----	----	----
Strontium, total	7440-24-6	E420/VA	A	0.00020	mg/L		0.110	0.206	----	----	----
Sulfur, total	7704-34-9	E420/VA	A	0.50	mg/L		5.01	11.2	----	----	----
Tellurium, total	13494-80-9	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Thallium, total	7440-28-0	E420/VA	A	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Thorium, total	7440-29-1	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Tin, total	7440-31-5	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Titanium, total	7440-32-6	E420/VA	A	0.00030	mg/L		0.00161	0.00080	----	----	----
Tungsten, total	7440-33-7	E420/VA	A	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Uranium, total	7440-61-1	E420/VA	A	0.000010	mg/L		0.000448	0.000444	----	----	----
Vanadium, total	7440-62-2	E420/VA	A	0.00050	mg/L		0.00084	<0.00050	----	----	----
Zinc, total	7440-66-6	E420/VA	A	0.0030	mg/L		<0.0030	<0.0030	----	----	----
Zirconium, total	7440-67-7	E420/VA	A	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	A	0.0010	mg/L		0.0045	0.0038	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	A	0.00010	mg/L		0.00019	0.00012	----	----	----
Barium, dissolved	7440-39-3	E421/VA	A	0.00010	mg/L		0.0304	0.115	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	A	0.000020	mg/L		<0.000020	<0.000020	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	A	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Boron, dissolved	7440-42-8	E421/VA	A	0.010	mg/L		<0.010	0.012	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	A	0.0000050	mg/L		0.0000070	<0.0000050	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	A	0.050	mg/L		27.5	51.9	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	A	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	A	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	A	0.00010	mg/L		<0.00010	<0.00010	----	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

					Client sample ID	PDI	Pine	----	----	----
					Client sampling date / time	22-Oct-2022 09:10	22-Oct-2022 11:10	----	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2203012-001	FJ2203012-002	--------	--------	--------
						Result	Result	----	----	----
Dissolved Metals										
Copper, dissolved	7440-50-8	E421/VA	A	0.00020	mg/L	0.00062	0.00031	----	----	----
Iron, dissolved	7439-89-6	E421/VA	A	0.010	mg/L	<0.010	<0.010	----	----	----
Lead, dissolved	7439-92-1	E421/VA	A	0.000050	mg/L	<0.000050	<0.000050	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	A	0.0010	mg/L	0.0011	0.0080	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	A	0.0050	mg/L	6.43	14.2	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	A	0.00010	mg/L	0.00070	0.00140	----	----	----
Mercury, dissolved	7439-97-6	E509-L/VA	A	0.50	ng/L	<0.50	<0.50	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	A	0.000050	mg/L	0.000765	0.000932	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	A	0.00050	mg/L	0.00066	<0.00050	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	A	0.050	mg/L	<0.050	<0.050	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	A	0.050	mg/L	0.447	0.672	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	A	0.00020	mg/L	0.00034	0.00032	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	A	0.000050	mg/L	0.000286	0.000446	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	A	0.050	mg/L	1.95	1.20	----	----	----
Silver, dissolved	7440-22-4	E421/VA	A	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	A	0.050	mg/L	1.18	4.62	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	A	0.00020	mg/L	0.109	0.204	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	A	0.50	mg/L	4.60	10.3	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	A	0.00020	mg/L	<0.00020	<0.00020	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	A	0.000010	mg/L	<0.000010	<0.000010	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Tin, dissolved	7440-31-5	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	A	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	A	0.00010	mg/L	<0.00010	<0.00010	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	A	0.000010	mg/L	0.000400	0.000414	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	A	0.00050	mg/L	<0.00050	<0.00050	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	A	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	A	0.00030	mg/L	<0.00030	<0.00030	----	----	----
Dissolved MeHg filtration location	----	EP537/VA		-	-	Field	Field	----	----	----
Dissolved mercury filtration location	----	EP509-L/VA		-	-	Field	Field	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PDI	Pine	----	----	----
					Client sampling date / time	22-Oct-2022 09:10	22-Oct-2022 11:10	----	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2203012-001	FJ2203012-002	--------	--------	--------
						Result	Result	----	----	----
Dissolved Metals										
Dissolved metals filtration location	----	EP421/VA		-	-	Field	Field	----	----	----
Speciated Metals										
Methylmercury (as MeHg), total	22967-92-6	E536/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	----	----	----
Iron, ferrous [Fe II], dissolved	15438-31-0	E541/VA	A	0.020	mg/L	<0.020	<0.020	----	----	----
Methylmercury (as MeHg), dissolved	22967-92-6	E537/VA	A	0.000000020	mg/L	<0.000000020	<0.000000020	----	----	----

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	: **FJ2203012**	Page	: 1 of 18
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Issue Date	: 25-Aug-2023 17:59
C-O-C number	: 2022-Oct-MON8/9-Day 4		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- 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
Method Blank (MB) Values								
Anions and Nutrients	QC-718139-001	----	Ammonia, total (as N)	7664-41-7	E298	0.0099 mg/L B	0.005 mg/L	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Laboratory Control Sample (LCS) Recoveries								
Total Metals	QC-MRG2-717501002	----	Phosphorus, total	7723-14-0	E420	122 % MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) PDI	E298	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pine	E298	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE PDI	E235.Cl	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Pine	E235.Cl	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE PDI	E378-U	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Pine	E378-U	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE PDI	E235.F	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Pine	E235.F	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE PDI	E235.NO3-L	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Pine	E235.NO3-L	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE PDI	E235.NO2-L	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Pine	E235.NO2-L	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE PDI	E392	22-Oct-2022	----	----	----		26-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Pine	E392	22-Oct-2022	----	----	----		26-Oct-2022	28 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE PDI	E235.SO4	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Pine	E235.SO4	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
PDI	E375-T	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid)										
Pine	E375-T	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
PDI	E366	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
Pine	E366	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
PDI	E372-U	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
Pine	E372-U	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	28-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
PDI	E509-L	22-Oct-2022	28-Oct-2022	28 days	6 days	✓	28-Oct-2022	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - dissolved (lab preserved)										
Pine	E509-L	22-Oct-2022	28-Oct-2022	28 days	6 days	✓	28-Oct-2022	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) PDI	E421	22-Oct-2022	30-Oct-2022	180 days	8 days	✓	31-Oct-2022	180 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Pine	E421	22-Oct-2022	30-Oct-2022	180 days	8 days	✓	31-Oct-2022	180 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) PDI	E358-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Pine	E358-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) PDI	E355-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Pine	E355-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE PDI	E290	22-Oct-2022	25-Oct-2022	14 days	3 days	✓	25-Oct-2022	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Pine	E290	22-Oct-2022	25-Oct-2022	14 days	3 days	✓	25-Oct-2022	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Pine	E329	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Colour (True) by Spectrometer (5 CU)										
HDPE PDI	E329	22-Oct-2022	25-Oct-2022	3 days	3 days	✓	25-Oct-2022	3 days	4 days	× EHT
Physical Tests : Conductivity in Water										
HDPE PDI	E100	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE Pine	E100	22-Oct-2022	25-Oct-2022	28 days	3 days	✓	25-Oct-2022	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE Pine	E108	22-Oct-2022	25-Oct-2022	0.25 hrs	77 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	84 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE PDI	E108	22-Oct-2022	25-Oct-2022	0.25 hrs	79 hrs	× EHTR-FM	25-Oct-2022	0.25 hrs	86 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE PDI	E162	22-Oct-2022	----	----	----		25-Oct-2022	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Pine	E162	22-Oct-2022	----	----	----		25-Oct-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE PDI	E160	22-Oct-2022	----	----	----		25-Oct-2022	7 days	3 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Pine	E160	22-Oct-2022	----	----	----		25-Oct-2022	7 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) PDI	E541	22-Oct-2022	24-Nov-2022	7 days	33 days	× EHT	24-Nov-2022	7 days	33 days	× EHT
Speciated Metals : Dissolved Ferrous Iron in Water by Colour										
Amber glass dissolved (hydrochloric acid) Pine	E541	22-Oct-2022	24-Nov-2022	7 days	33 days	× EHT	24-Nov-2022	7 days	33 days	× EHT
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) PDI	E537	22-Oct-2022	07-Nov-2022	180 days	16 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Dissolved Methylmercury in Water by GCAFS										
Amber glass dissolved (hydrochloric acid) Pine	E537	22-Oct-2022	07-Nov-2022	180 days	16 days	✓	11-Nov-2022	180 days	4 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) PDI	E536	22-Oct-2022	05-Nov-2022	180 days	14 days	✓	07-Nov-2022	180 days	16 days	✓
Speciated Metals : Total Methylmercury in Water by GCAFS										
Amber glass total (hydrochloric acid) Pine	E536	22-Oct-2022	05-Nov-2022	180 days	14 days	✓	07-Nov-2022	180 days	16 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) PDI	E508-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)										
Pre-cleaned amber glass - total (lab preserved) Pine	E508-L	22-Oct-2022	27-Oct-2022	28 days	5 days	✓	27-Oct-2022	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) PDI	E420	22-Oct-2022	27-Oct-2022	180 days	5 days	✓	28-Oct-2022	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
Pine	E420	22-Oct-2022	27-Oct-2022	180 days	5 days	✓	28-Oct-2022	180 days	6 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **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	714167	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	718139	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	714170	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714177	1	3	33.3	5.0	✓
Conductivity in Water	E100	714168	1	4	25.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756855	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	720452	1	16	6.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	718134	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714178	1	4	25.0	5.0	✓
Fluoride in Water by IC	E235.F	714169	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714171	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714172	1	8	12.5	5.0	✓
pH by Meter	E108	714166	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714174	1	4	25.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	718138	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717494	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	717501	1	10	10.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	718136	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	718135	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	718137	1	4	25.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	714167	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	718139	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	714170	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714177	1	3	33.3	5.0	✓
Conductivity in Water	E100	714168	1	4	25.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756855	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	720452	1	16	6.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	718134	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714178	1	4	25.0	5.0	✓
Fluoride in Water by IC	E235.F	714169	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714171	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714172	1	8	12.5	5.0	✓
pH by Meter	E108	714166	1	4	25.0	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714174	1	4	25.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	718138	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717494	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	717501	1	10	10.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	718136	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	718135	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	718137	1	4	25.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	714167	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	718139	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	714170	1	18	5.5	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	714177	1	3	33.3	5.0	✓
Conductivity in Water	E100	714168	1	4	25.0	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756855	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	720452	1	16	6.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	718134	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714178	1	4	25.0	5.0	✓
Fluoride in Water by IC	E235.F	714169	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714171	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714172	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714174	1	4	25.0	5.0	✓
TDS by Gravimetry	E162	714302	1	19	5.2	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	718138	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717494	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	717501	1	10	10.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	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*
Method Blanks (MB) - Continued							
Total Nitrogen by Colourimetry	E366	718136	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	718135	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	718137	1	4	25.0	5.0	✓
TSS by Gravimetry	E160	714283	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	718139	1	9	11.1	5.0	✓
Chloride in Water by IC	E235.Cl	714170	1	18	5.5	5.0	✓
Dissolved Ferrous Iron in Water by Colour	E541	756855	1	2	50.0	5.0	✓
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L	719532	1	19	5.2	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	720452	1	16	6.2	5.0	✓
Dissolved Methylmercury in Water by GCAFS	E537	733465	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	718134	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	714178	1	4	25.0	5.0	✓
Fluoride in Water by IC	E235.F	714169	1	4	25.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	714171	1	7	14.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	714172	1	8	12.5	5.0	✓
Reactive Silica by Colourimetry	E392	716537	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	714174	1	4	25.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	718138	1	4	25.0	5.0	✓
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L	717494	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	717501	2	10	20.0	5.0	✓
Total Methylmercury in Water by GCAFS	E536	730278	2	27	7.4	5.0	✓
Total Nitrogen by Colourimetry	E366	718136	1	4	25.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	718135	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	718137	1	4	25.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
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.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
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 Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E508-L 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 CVAFS.
Dissolved Mercury in Water by CVAFS (Low Level, LOR = 0.5 ppt)	E509-L 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 CVAFS.
Total Methylmercury in Water by GCAFS	E536 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury in Water by GCAFS	E537 ALS Environmental - Vancouver	Water	EPA 1630 (mod)	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	E541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and Environ. Sci. Technol. 1999, 33, 5, 807–813. The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method. Holding time is 7 days for 0.45um filtration or 6 months if samples have been filtered using 0.1um filters.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Vancouver	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Kjeldahl Nitrogen (Calculation)	EC318 ALS Environmental - Vancouver	Water	BC MOE LABORATORY MANUAL (2005)	Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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 (Low Level)	EP509-L ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
Total Methylmercury Water Preparation	EP536 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Methylmercury Water Preparation	EP537 ALS Environmental - Vancouver	Water	EPA 1630	This method follows Method 1630 of the US EPA. Samples are distilled under an inert gas flow to isolate methylmercury and minimize matrix interferences. The distillate is analyzed by aqueous phase ethylation, purge and trap, desorption and GC separation. The separated species are then pyrolized to elemental Hg and quantified by cold vapour atomic flourescence spectroscopy. Results are reported "as MeHg".
Dissolved Ferrous Iron in Water by Colour	EP541 ALS Environmental - Vancouver	Water	APHA 3500-Fe B/James Ball et al (1999)	This analysis is carried out using procedures adapted from APHA 3500-Fe B and "A New Method for the Direct Determination of Dissolved Iron Concentration in Acid Mine Waters" published by James W. Ball et al (1999). The procedure involves preliminary sample filtration, and ferrous iron is determined using the "FerroZine" colourimetric method.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2203012**	Page	: 1 of 18
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: ALS Environmental - Fort St. John
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Surface Water MON8/9-With Metals	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.02	Date Analysis Commenced	: 25-Oct-2022
C-O-C number	: 2022-Oct-MON8/9-Day 4	Issue Date	: 25-Aug-2023 17:59
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Vancouver Inorganics, Burnaby, British Columbia
Cindy Tang	Team Leader - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Hamideh Moradi	Analyst	Vancouver Metals, Burnaby, British Columbia
Jayden Piattelli	Analyst	Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Parnian Sane	Analyst	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: 714166)											
FJ2203021-001	Anonymous	pH	----	E108	0.10	pH units	8.11	8.13	0.246%	4%	----
Physical Tests (QC Lot: 714167)											
FJ2203021-001	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	184	185	0.530%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	184	185	0.530%	20%	----
Physical Tests (QC Lot: 714168)											
FJ2203021-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	1210	1200	0.996%	10%	----
Physical Tests (QC Lot: 714177)											
FJ2203012-001	PDI	Colour, true	----	E329	5.0	CU	6.1	6.5	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 714283)											
FJ2202955-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 714302)											
FJ2202955-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	318	305	4.18%	20%	----
Anions and Nutrients (QC Lot: 714169)											
FJ2203021-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.189	0.185	0.004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714170)											
FJ2203021-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714171)											
FJ2203021-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	<0.0250	<0.0250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 714172)											
FJ2203021-001	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: 714174)											
FJ2203021-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	554	554	0.0604%	20%	----
Anions and Nutrients (QC Lot: 714178)											
FJ2203012-001	PDI	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 716537)											
EO2209213-024	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 718136)											
FJ2203012-001	PDI	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.193	0.196	0.003	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*
Anions and Nutrients (QC Lot: 718137)											
FJ2203012-001	PDI	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0084	0.0080	0.0004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 718138)											
FJ2203012-001	PDI	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0023	0.0021	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 718139)											
FJ2203012-001	PDI	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0120	0.0121	0.00008	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 718134)											
FJ2203012-001	PDI	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.57	2.84	0.28	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 718135)											
FJ2203012-001	PDI	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.90	2.89	0.004	Diff <2x LOR	----
Total Metals (QC Lot: 717494)											
CG2214693-001	Anonymous	Mercury, total	7439-97-6	E508-L	0.50	ng/L	<0.00050 µg/L	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 717501)											
VA22C5469-001	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	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00020	<0.00010	0.00010	Diff <2x LOR	----
		Beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<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	<0.010	<0.010	0	Diff <2x LOR	----
		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	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	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	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	<0.050	<0.050	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: 717501) - continued											
VA22C5469-001	Anonymous	Rubidium, total	7440-17-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		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	<0.10	<0.10	0	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	<0.50	<0.50	0	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	<0.00030	0	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	<0.000010	<0.000010	0	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	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 719532)											
EO2208953-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	1.00	ng/L	<1.00	<1.00	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 720452)											
FJ2203006-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0501	0.0488	2.64%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.0101	0.00998	1.06%	20%	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00019	0.00015	0.00004	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0838	0.0815	2.82%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	0.000040	0.000040	0.0000007	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000181	0.0000140	0.0000041	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	11.5	11.4	0.565%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000019	0.000017	0.000002	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00013	0.00013	0.000002	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.0110	0.0107	2.62%	20%	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.042	0.040	0.002	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 720452) - continued											
FJ2203006-001	Anonymous	Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000108	0.000106	0.000002	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0045	0.0045	0.00002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	4.69	4.49	4.24%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00064	0.00058	0.00007	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00274	0.00269	1.84%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00478	0.00454	0.00023	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	1.05	1.03	2.53%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00078	0.00073	0.00005	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00330	0.00346	4.51%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.17	1.16	0.742%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	0.000025	0.000025	0.0000001	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.152	0.143	0.009	Diff <2x LOR	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0244	0.0238	2.65%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	11.0	11.2	1.33%	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	0.00196	0.00150	0.00047	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	0.000177	0.000179	0.726%	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	0.0061	0.0061	0.00005	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 730278)											
FJ2202994-001	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 733465)											
FC2202619-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.000020	µg/L	0.000060	0.000058	0.000002	Diff <2x LOR	----
Speciated Metals (QC Lot: 733968)											
FJ2202978-004	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.000020	µg/L	<0.000000020 mg/L	<0.000020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 756855)											
FJ2203012-001	PDI	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.020	mg/L	<0.020	<0.020	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: 714167)						
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, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 714168)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 714177)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 714283)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 714302)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 714169)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 714170)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 714171)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 714172)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 714174)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 714178)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 716537)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 718136)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 718137)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 718138)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 718138) - continued						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 718139)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	# 0.0099	B
Organic / Inorganic Carbon (QCLot: 718134)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 718135)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 717494)						
Mercury, total	7439-97-6	E508-L	0.5	ng/L	<0.50	----
Total Metals (QCLot: 717501)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 717501) - continued						
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 719532)						
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	<0.50	----
Dissolved Metals (QCLot: 720452)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 720452) - continued						
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
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	----
Speciated Metals (QCLot: 730278)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733465)						
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 733968)						
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	<0.000020	----
Speciated Metals (QCLot: 756855)						
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	<0.020	----

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 714166)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 714167)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 714168)									
Conductivity	----	E100	1	µS/cm	146.9 µS/cm	99.4	90.0	110	----
Physical Tests (QCLot: 714177)									
Colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 714283)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	90.3	85.0	115	----
Physical Tests (QCLot: 714302)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 714169)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 714170)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 714171)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	107	90.0	110	----
Anions and Nutrients (QCLot: 714172)									
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: 714174)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	109	90.0	110	----
Anions and Nutrients (QCLot: 714178)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	90.8	80.0	120	----
Anions and Nutrients (QCLot: 716537)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 718136)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.8	75.0	125	----
Anions and Nutrients (QCLot: 718137)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	88.5	80.0	120	----
Anions and Nutrients (QCLot: 718138)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	90.4	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Anions and Nutrients (QCLot: 718139)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	90.1	85.0	115	----
Organic / Inorganic Carbon (QCLot: 718134)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.1	80.0	120	----
Organic / Inorganic Carbon (QCLot: 718135)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Total Metals (QCLot: 717494)									
Mercury, total	7439-97-6	E508-L	0.5	ng/L	5 ng/L	112	80.0	120	----
Total Metals (QCLot: 717501)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	117	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	110	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	120	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	114	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	108	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	110	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	100	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	111	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	108	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	108	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	115	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	114	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	114	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	106	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	109	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	116	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	116	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	111	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	115	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	# 122	80.0	120	MES
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	115	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	113	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	109	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	110	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	103	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 717501) - continued									
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	115	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	111	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	115	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	115	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	99.3	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	106	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	108	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	109	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	118	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	105	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Mercury, dissolved	7439-97-6	E509-L	0.5	ng/L	5 ng/L	100	80.0	120	----
Dissolved Metals (QCLot: 720452)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	112	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	109	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	112	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	108	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	100	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	110	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	107	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	106	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	104	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 720452) - 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	110	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	108	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	109	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	111	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	101	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	112	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	106	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	110	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	106	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	106	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	104	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	110	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	112	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Speciated Metals (QCLot: 730278)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	81.5	70.0	130	----
Speciated Metals (QCLot: 733465)									
Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00002	µg/L	0.0025 µg/L	83.2	70.0	130	----
Speciated Metals (QCLot: 733968)									
Methylmercury (as MeHg), total	22967-92-6	E536	0.00002	µg/L	0.0025 µg/L	79.0	70.0	130	----
Speciated Metals (QCLot: 756855)									
Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.02	mg/L	0.5 mg/L	103	80.0	120	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 714169)										
FJ2203012-002	Pine	Fluoride	16984-48-8	E235.F	1.00 mg/L	1 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 714170)										
FJ2203012-002	Pine	Chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 714171)										
FJ2203012-002	Pine	Nitrate (as N)	14797-55-8	E235.NO3-L	2.68 mg/L	2.5 mg/L	107	75.0	125	----
Anions and Nutrients (QCLot: 714172)										
FJ2203012-002	Pine	Nitrite (as N)	14797-65-0	E235.NO2-L	0.489 mg/L	0.5 mg/L	97.9	75.0	125	----
Anions and Nutrients (QCLot: 714174)										
FJ2203012-002	Pine	Sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 714178)										
FJ2203012-002	Pine	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0280 mg/L	0.03 mg/L	93.3	70.0	130	----
Anions and Nutrients (QCLot: 716537)										
EO2209213-025	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.41 mg/L	10 mg/L	94.1	75.0	125	----
Anions and Nutrients (QCLot: 718136)										
FJ2203012-002	Pine	Nitrogen, total	7727-37-9	E366	0.406 mg/L	0.4 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 718137)										
FJ2203012-002	Pine	Phosphorus, total	7723-14-0	E372-U	0.0469 mg/L	0.05 mg/L	93.9	70.0	130	----
Anions and Nutrients (QCLot: 718138)										
FJ2203012-002	Pine	Phosphorus, total dissolved	7723-14-0	E375-T	0.0474 mg/L	0.05 mg/L	94.7	70.0	130	----
Anions and Nutrients (QCLot: 718139)										
FJ2203012-002	Pine	Ammonia, total (as N)	7664-41-7	E298	0.0958 mg/L	0.1 mg/L	95.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 718134)										
FJ2203012-002	Pine	Carbon, dissolved organic [DOC]	----	E358-L	4.97 mg/L	5 mg/L	99.4	70.0	130	----
Organic / Inorganic Carbon (QCLot: 718135)										
FJ2203012-002	Pine	Carbon, total organic [TOC]	----	E355-L	4.73 mg/L	5 mg/L	94.6	70.0	130	----
Total Metals (QCLot: 717494)										
CG2214734-001	Anonymous	Mercury, total	7439-97-6	E508-L	5.15 ng/L	5 ng/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
Total Metals (QCLot: 717501)										
VA22C5469-002	Anonymous	Aluminum, total	7429-90-5	E420	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		Barium, total	7440-39-3	E420	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
VA22C5469-002	Anonymous	Antimony, total	7440-36-0	E420	0.0199 mg/L	0.02 mg/L	99.6	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0211 mg/L	0.02 mg/L	106	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0102 mg/L	0.01 mg/L	102	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	0.00419 mg/L	0.004 mg/L	105	70.0	130	----
		Calcium, total	7440-70-2	E420	4.08 mg/L	4 mg/L	102	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0101 mg/L	0.01 mg/L	101	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0419 mg/L	0.04 mg/L	105	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		Copper, total	7440-50-8	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		Iron, total	7439-89-6	E420	2.05 mg/L	2 mg/L	102	70.0	130	----
		Lead, total	7439-92-1	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Lithium, total	7439-93-2	E420	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		Magnesium, total	7439-95-4	E420	1.06 mg/L	1 mg/L	106	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0207 mg/L	0.02 mg/L	103	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0205 mg/L	0.02 mg/L	102	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0430 mg/L	0.04 mg/L	108	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.6 mg/L	10 mg/L	106	70.0	130	----
		Potassium, total	7440-09-7	E420	4.22 mg/L	4 mg/L	106	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Silicon, total	7440-21-3	E420	9.83 mg/L	10 mg/L	98.3	70.0	130	----
		Silver, total	7440-22-4	E420	0.00431 mg/L	0.004 mg/L	108	70.0	130	----
		Sodium, total	7440-23-5	E420	2.09 mg/L	2 mg/L	104	70.0	130	----
		Strontium, total	7440-24-6	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Sulfur, total	7704-34-9	E420	21.0 mg/L	20 mg/L	105	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00393 mg/L	0.004 mg/L	98.3	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0211 mg/L	0.02 mg/L	106	70.0	130	----
		Tin, total	7440-31-5	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0412 mg/L	0.04 mg/L	103	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0200 mg/L	0.02 mg/L	99.8	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: 717501) - continued										
VA22C5469-002	Anonymous	Uranium, total	7440-61-1	E420	0.00411 mg/L	0.004 mg/L	103	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.107 mg/L	0.1 mg/L	107	70.0	130	----
		Zinc, total	7440-66-6	E420	0.412 mg/L	0.4 mg/L	103	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
Dissolved Metals (QCLot: 719532)										
FC2202541-001	Anonymous	Mercury, dissolved	7439-97-6	E509-L	4.48 ng/L	5 ng/L	89.6	70.0	130	----
Dissolved Metals (QCLot: 720452)										
FJ2203006-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.210 mg/L	0.2 mg/L	105	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0198 mg/L	0.02 mg/L	99.1	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	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00937 mg/L	0.01 mg/L	93.7	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.094 mg/L	0.1 mg/L	93.7	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00402 mg/L	0.004 mg/L	101	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00993 mg/L	0.01 mg/L	99.3	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0196 mg/L	0.02 mg/L	98.1	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0197 mg/L	0.02 mg/L	98.5	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	98.0	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.7 mg/L	10 mg/L	107	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	4.07 mg/L	4 mg/L	102	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0418 mg/L	0.04 mg/L	104	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.54 mg/L	10 mg/L	95.4	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00418 mg/L	0.004 mg/L	104	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	2.07 mg/L	2 mg/L	104	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 720452) - continued										
FJ2203006-002	Anonymous	Sulfur, dissolved	7704-34-9	E421	19.9 mg/L	20 mg/L	99.5	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00383 mg/L	0.004 mg/L	95.7	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0216 mg/L	0.02 mg/L	108	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00391 mg/L	0.004 mg/L	97.8	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.420 mg/L	0.4 mg/L	105	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
Speciated Metals (QCLot: 730278)										
FJ2202994-002	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00216 µg/L	0.0025 µg/L	86.2	60.0	140	----
Speciated Metals (QCLot: 733465)										
FJ2202994-001	Anonymous	Methylmercury (as MeHg), dissolved	22967-92-6	E537	0.00152 µg/L	0.0025 µg/L	61.0	60.0	140	----
Speciated Metals (QCLot: 733968)										
FJ2202994-003	Anonymous	Methylmercury (as MeHg), total	22967-92-6	E536	0.00175 µg/L	0.0025 µg/L	70.0	60.0	140	----
Speciated Metals (QCLot: 756855)										
FJ2203012-002	Pine	Iron, ferrous [Fe II], dissolved	15438-31-0	E541	0.452 mg/L	0.5 mg/L	90.5	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 4

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

☐ 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

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order # (ALS use only): FJ2203012

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Fort St. John Work Order Reference FJ2203012

Telephone : +1 250 261 5517

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample (This d	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.00000002 mg/L)	Dissolved Methyl Hg by GCAFS (0.00000002 mg/L)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
						F/P	P				F		F		F			
	~~PD5~~ PR2.81	8 Oct 22	08:20	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~MD~~	8 Oct 22	11:05	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~MD-FB~~	8 Oct 22	08:20	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~PD5~~																	
	PDI	22-Oct-2022	9:10	Water	9	R	R	R	R	R	R	R	R	R	R			
	PINE	22-Oct-2022	11:10	Water	9	R	R	R	R	R	R	R	R	R	R			

FJAE Shipping & Receiving

Call Out ___ Expedite

___ Priority

1 # of Coolers ✓ Air

# of Carboys ___ Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
4.1							

SHIPMENT RELEASE (client use)

Released by: Date: Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time: 1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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.

AUG 2020 F

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-Oct-MON8/9- Day 4

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Surface water MON8/9- with metals
PO / AFE:	1200-25.03.02
LSD:	

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

ALS Lab Work Order # (ALS use only): FJ2203012

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Fort St. John Work Order Reference FJ2203012

Telephone : +1 250 261 5517

ALS Sample # (ALS use only)	Sample (This d	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Alk., Ec, pH, TDS, TSS, Anions, Silicate, diss ortho P, colour, pH	DOC, Total dissolved P	NH3, Total Kjeldahl Nitrogen, Total N, TOC, Total P	IONBALANCE-BC-CL	Total Methyl Hg by GCAFS (0.000000002 mg/L)	Dissolved Methyl Hg by GCAFS (0.000000002 mg/L)	Total Metals by CRC ICPMS, Hardness from Total Ca/Mg	Dissolved Metals by CRC ICPMS, Hardness	Total Mercury in Water CVAFS (Low Level 0.0000005 mg/L)	Dissolved Mercury in Water by CVAFS (Low Level 0.0000005 mg/L)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD6~~ CR-2.81	18-Oct-22	08:20	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~MD~~	18-Oct-22	11:05	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~MD FB~~	18-Oct-22	08:22	Water	9	R	R	R	R	R	R	R	R	R	R			
	~~PD5~~																	
	PD1	28-Oct-2022	9:10	Water	9	R	R	R	R	R	R	R	R	R	R			
	PINE	28-Oct-2022	11:10	Water	9	R	R	R	R	R	R	R	R	R	R			

FIAE Shipping & Receiving

___ Call Out ___ Expedite

___ Priority

1 # of Coolers ✓ Air

___ # of Carboys ___ Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

gmann@azimuthgroup.ca imcivor@azimuthgroup.ca

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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
4.1				9°C Carg

SHIPMENT RELEASE (client use)

Released by: Date: Oct 21 2022 Time: 7:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Oct 22 22 Time: 13:00

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: M.K Date: 10/24/22 Time: 11:15 AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 F

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 E. 2022 ALS Environmental Laboratory Reports for Sediment Quality Sampling

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202948**	Page	: 1 of 5
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.04	Date Analysis Commenced	: 20-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 31-Oct-2022 10:54
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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*
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Jwan Abdalla	Laboratory Analyst	Sask Soils, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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 Unit
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA	POUCE	PD4	KR	----
					Client sampling date / time	17-Oct-2022 17:15	17-Oct-2022 10:45	17-Oct-2022 13:40	17-Oct-2022 15:25	----
						FJ2202948-001	FJ2202948-002	FJ2202948-003	FJ2202948-004	--------
						Result	Result	Result	Result	----
Physical Tests										
pH (1:2 soil:water)	----	E108	0.10	pH units		8.22	8.18	8.04	8.51	----
Particle Size										
grain size curve	----	E185A	-	-		See Attached	See Attached	See Attached	See Attached	----
clay (<0.004mm)	----	EC184A	1.0	%		5.6	2.5	9.0	5.8	----
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%		20.8	2.0	22.6	6.7	----
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%		14.4	2.8	23.7	7.6	----
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%		43.3	3.1	30.1	14.3	----
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%		15.7	12.2	13.5	47.6	----
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%		<1.0	39.7	1.0	17.7	----
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%		<1.0	22.8	<1.0	<1.0	----
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%		<1.0	12.8	<1.0	<1.0	----
gravel (>2mm)	----	EC184A	1.0	%		<1.0	2.1	<1.0	<1.0	----
Anions and Nutrients										
nitrogen, total	7727-37-9	E366	0.020	%		0.048	0.026	0.071	0.048	----
Organic / Inorganic Carbon										
carbon, total [TC]	----	E351	0.050	%		0.644	1.39	1.19	1.05	----
carbon, inorganic [IC]	----	E354	0.050	%		0.138	0.178	0.426	0.542	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%		1.15	1.48	3.55	4.52	----
carbon, total organic [TOC]	----	EC356	0.050	%		0.506	1.21	0.764	0.508	----
organic matter	----	EC356	0.10	%		0.87	2.09	1.32	0.88	----
Plant Available Nutrients										
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg		1.4	1.3	1.4	1.1	----
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	----
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg		2.4	<2.0	<2.0	<2.0	----
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg		<0.40	<0.40	<0.40	<0.40	----
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	----
Metals										
aluminum	7429-90-5	E440	50	mg/kg		5090	2550	6820	6940	----

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BEA	POUCE	PD4	KR	----
					Client sampling date / time	17-Oct-2022 17:15	17-Oct-2022 10:45	17-Oct-2022 13:40	17-Oct-2022 15:25	----
						FJ2202948-001	FJ2202948-002	FJ2202948-003	FJ2202948-004	--------
						Result	Result	Result	Result	----
Metals										
antimony	7440-36-0	E440	0.10	mg/kg		0.64	0.49	0.63	0.57	----
arsenic	7440-38-2	E440	0.10	mg/kg		8.61	7.29	8.22	6.66	----
barium	7440-39-3	E440	0.50	mg/kg		443	114	423	365	----
beryllium	7440-41-7	E440	0.10	mg/kg		0.42	0.34	0.47	0.51	----
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	<0.20	<0.20	<0.20	----
boron	7440-42-8	E440	5.0	mg/kg		<5.0	<5.0	6.8	6.5	----
cadmium	7440-43-9	E440	0.020	mg/kg		0.424	0.160	0.577	0.474	----
calcium	7440-70-2	E440	50	mg/kg		3920	4880	12300	13500	----
chromium	7440-47-3	E440	0.50	mg/kg		12.4	5.86	15.2	15.0	----
cobalt	7440-48-4	E440	0.10	mg/kg		7.39	4.13	7.38	7.03	----
copper	7440-50-8	E440	0.50	mg/kg		11.9	6.08	14.1	13.5	----
iron	7439-89-6	E440	50	mg/kg		17900	19900	18600	16600	----
lead	7439-92-1	E440	0.50	mg/kg		7.07	4.02	7.81	7.60	----
lithium	7439-93-2	E440	2.0	mg/kg		7.3	4.2	9.9	10.4	----
magnesium	7439-95-4	E440	20	mg/kg		2390	1690	4510	3950	----
manganese	7439-96-5	E440	1.0	mg/kg		240	193	295	251	----
mercury	7439-97-6	E510	0.0500	mg/kg		0.0520	<0.0500	0.0554	<0.0500	----
molybdenum	7439-98-7	E440	0.10	mg/kg		1.06	0.84	1.17	0.88	----
nickel	7440-02-0	E440	0.50	mg/kg		20.6	12.1	21.9	22.6	----
phosphorus	7723-14-0	E440	50	mg/kg		528	460	617	490	----
potassium	7440-09-7	E440	100	mg/kg		940	490	1370	1310	----
selenium	7782-49-2	E440	0.20	mg/kg		0.57	0.36	0.65	0.56	----
silver	7440-22-4	E440	0.10	mg/kg		0.13	<0.10	0.16	0.15	----
sodium	7440-23-5	E440	50	mg/kg		88	71	82	92	----
strontium	7440-24-6	E440	0.50	mg/kg		25.4	21.5	43.2	41.9	----
sulfur	7704-34-9	E440	1000	mg/kg		<1000	<1000	<1000	<1000	----
thallium	7440-28-0	E440	0.050	mg/kg		0.110	<0.050	0.141	0.142	----
tin	7440-31-5	E440	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	----
titanium	7440-32-6	E440	1.0	mg/kg		39.9	53.3	34.2	24.8	----
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	BEA	POUCE	PD4	KR	----
					Client sampling date / time	17-Oct-2022 17:15	17-Oct-2022 10:45	17-Oct-2022 13:40	17-Oct-2022 15:25	----
Analyte	CAS Number	Method	LOR	Unit		FJ2202948-001	FJ2202948-002	FJ2202948-003	FJ2202948-004	--------
						Result	Result	Result	Result	----
Metals										
uranium	7440-61-1	E440	0.050	mg/kg		0.725	0.539	0.815	0.671	----
vanadium	7440-62-2	E440	0.20	mg/kg		26.4	17.2	32.4	30.7	----
zinc	7440-66-6	E440	2.0	mg/kg		76.5	37.9	77.2	70.9	----
zirconium	7440-67-7	E440	1.0	mg/kg		2.4	2.1	1.9	1.8	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202948**	Page	: 1 of 13
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.04	Issue Date	: 31-Oct-2022 10:51
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3		
Sampler	: Pat Beaupre		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Metals	QC-MRG2-714059002	----	iron	7439-89-6	E440	79.7 % MES	80.0-120%	Recovery less than lower control limit
Metals	QC-MRG2-714059002	----	silver	7440-22-4	E440	79.6 % MES	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag BEA	E366	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag KR	E366	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PD4	E366	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	6 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag POUCE	E366	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	6 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap KR	E510	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PD4	E510	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap POUCE	E510	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	10 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BEA	E510	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
KR	E440	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PD4	E440	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
POUCE	E440	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BEA	E440	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
BEA	E351	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
KR	E351	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PD4	E351	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
POUCE	E351	17-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag BEA	E354	17-Oct-2022	----	----	----		25-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag KR	E354	17-Oct-2022	----	----	----		25-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PD4	E354	17-Oct-2022	----	----	----		25-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag POUCE	E354	17-Oct-2022	----	----	----		25-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag BEA	E185A	17-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag KR	E185A	17-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PD4	E185A	17-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag POUCE	E185A	17-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap KR	E108	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	10 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap										
PD4	E108	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	10 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap										
POUCE	E108	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	10 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap										
BEA	E108	17-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	9 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag										
BEA	E312A	17-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag										
KR	E312A	17-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag										
PD4	E312A	17-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag										
POUCE	E312A	17-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag										
BEA	E269.N+N	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	8 days	× EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag										
KR	E269.N+N	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	8 days	× EHT

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PD4	E269.N+N	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	8 days	× EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag POUCE	E269.N+N	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	3 days	8 days	× EHT
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag BEA	E269.NO2	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag KR	E269.NO2	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PD4	E269.NO2	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag POUCE	E269.NO2	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag BEA	E384	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	8 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag KR	E384	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	8 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PD4	E384	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag POUCE	E384	17-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	8 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: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	1	20	5.0	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	1	13	7.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	1	7	14.2	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	1	14	7.1	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	1	14	7.1	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	714061	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	1	18	5.5	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	1	16	6.2	5.0	✓
Total Nitrogen by Combustion	E366	710369	1	6	16.6	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	2	20	10.0	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	2	13	15.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	2	7	28.5	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	2	20	10.0	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	2	14	14.2	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	2	14	14.2	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	714061	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	2	18	11.1	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	2	16	12.5	10.0	✓
Total Nitrogen by Combustion	E366	710369	2	6	33.3	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	1	20	5.0	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	1	13	7.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	1	7	14.2	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	1	14	7.1	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	1	18	5.5	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	1	16	6.2	5.0	✓
Total Nitrogen by Combustion	E366	710369	1	6	16.6	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
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrite is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202948**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 17-Oct-2022 18:50
PO	: 1200-25.03.04	Date Analysis Commenced	: 20-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 31-Oct-2022 11:00
Sampler	: Pat Beaupre ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 4		
No. of samples analysed	: 4		

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
- Reference Material (RM) 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*
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Jwan Abdalla	Laboratory Analyst	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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: **Soil/Solid**

					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: 714061)											
FJ2202947-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	6.35	6.34	0.2%	5%	----
Anions and Nutrients (QC Lot: 710369)											
FJ2202948-001	BEA	nitrogen, total	7727-37-9	E366	0.020	%	0.048	0.052	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 710368)											
FJ2202948-001	BEA	carbon, total [TC]	----	E351	0.050	%	0.644	0.620	3.80%	20%	----
Organic / Inorganic Carbon (QC Lot: 712868)											
FJ2202948-001	BEA	carbon, inorganic [IC]	----	E354	0.050	%	0.138	0.138	0.0001	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 711093)											
EO2208821-007	Anonymous	ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	1.3	1.3	0.06	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712214)											
FJ2202957-002	Anonymous	nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712215)											
FJ2202957-002	Anonymous	nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712225)											
SK2205969-018	Anonymous	phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	28.7	28.4	1.30%	30%	----
Metals (QC Lot: 714059)											
FJ2202947-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 714060)											
FJ2202947-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	9520	8700	9.06%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.29	0.27	0.02	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	4.86	4.31	12.0%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	390	339	14.1%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.45	0.37	0.08	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	6.8	5.6	1.2	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.792	0.655	18.9%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	4220	3690	13.6%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	19.4	18.1	7.10%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	7.03	6.19	12.7%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	11.9	10.8	9.45%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 714060) - continued											
FJ2202947-001	Anonymous	iron	7439-89-6	E440	50	mg/kg	17800	16600	6.90%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	8.04	7.19	11.1%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	12.2	11.0	1.2	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	2600	2500	3.84%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	466	361	25.4%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	0.70	0.66	5.01%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	21.8	20.5	6.21%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	801	683	15.9%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	1560	1410	10.0%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.39	0.27	0.12	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.27	0.23	0.04	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	50	<50	0.2	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	24.3	22.0	9.62%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.138	0.122	0.016	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	118	115	2.69%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.506	0.478	5.65%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	37.9	34.4	9.75%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	87.2	74.3	16.0%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 710369)						
nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 710368)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 712868)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 711093)						
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 712214)						
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 712215)						
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 712225)						
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 714059)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 714060)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 714060) - continued						
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 714061)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.5	95.0	105	----
Anions and Nutrients (QCLot: 710369)									
nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	99.8	90.0	110	----
Organic / Inorganic Carbon (QCLot: 710368)									
carbon, total [TC]	----	E351	0.05	%	48 %	101	90.0	110	----
Organic / Inorganic Carbon (QCLot: 712868)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	93.3	90.0	110	----
Plant Available Nutrients (QCLot: 711093)									
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	102	80.0	120	----
Plant Available Nutrients (QCLot: 712214)									
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	107	70.0	130	----
Plant Available Nutrients (QCLot: 712215)									
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	108	70.0	130	----
Plant Available Nutrients (QCLot: 712225)									
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	100	80.0	120	----
Metals (QCLot: 714059)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	89.6	80.0	120	----
Metals (QCLot: 714060)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	86.4	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	98.3	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	90.5	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	88.2	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	92.9	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	93.2	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	83.2	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	85.7	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	87.7	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	86.1	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	85.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 714060) - continued									
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	85.2	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	# 79.7	80.0	120	MES
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	90.4	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	94.5	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	89.3	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	88.2	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	91.8	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	85.7	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	90.3	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	87.2	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	90.3	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	# 79.6	80.0	120	MES
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	90.8	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	90.8	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.4	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	96.6	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	85.6	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	84.5	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	87.1	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	84.3	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	88.0	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	85.5	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	86.9	80.0	120	----

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).*

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 710369)									
	RM	nitrogen, total	7727-37-9	E366	0.11 %	110	80.0	120	----
Organic / Inorganic Carbon (QCLot: 710368)									
	RM	carbon, total [TC]	----	E351	1.4 %	104	80.0	120	----
Organic / Inorganic Carbon (QCLot: 712868)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 711093)									
	RM	ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	99.5	80.0	120	----
Plant Available Nutrients (QCLot: 712214)									
	RM	nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	57.6	0	570	----
Plant Available Nutrients (QCLot: 712215)									
	RM	nitrate + nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	84.4	70.0	130	----
Plant Available Nutrients (QCLot: 712225)									
	RM	phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	101	80.0	120	----
Metals (QCLot: 714059)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	91.2	70.0	130	----
Metals (QCLot: 714060)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	90.9	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	86.9	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	85.4	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	90.1	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	116	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	80.3	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	95.6	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	101	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	86.8	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	83.9	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	87.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 714060) - continued									
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	95.2	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	104	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	92.4	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	95.3	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	89.5	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	88.2	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	86.8	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	102	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	95.0	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	90.5	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	93.8	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	81.7	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	105	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	91.0	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	85.1	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	84.3	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order # (ALS use only): FJ2202948

Fort St. John Work Order Reference

Telephone : +1 250 261 5517

Contact: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample (This de	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BEA	17-Oct-2022	17:15	Sediment	5	R	R			
	~~PD2~~			~~Sediment~~						
	~~PINE~~			~~Sediment~~						
	~~PD1~~			~~Sediment~~						
	POUCE	17 OCT 22	10:45	Sediment	5	R	R			
	PD4	17 Oct 22	13:40	Sediment	5	R	R			
	KR	17 Oct 22	15:25	Sediment	5	R	R			
	~~PD3~~			~~Sediment~~						
	~~PD5~~			~~Sediment~~						

FAE Shipping & Receiving — Call Out: Expedite / Priority / Air — # of Coolers: 1 — # of Carboys: Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

Note: 2 jars + 3 whirlpacks per site

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			
7.5							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
BM	17 Oct 2022	18:45

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Oct 17/22	1850

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: skennedy@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#
Job #:	Sediment for MON8/9	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.04	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (ALS use only): FJ2202948 ALS Contact: Sean Zhang Sampler: Pat Beaupre

Fort St. John Work Order Reference FJ2202948

Telephone : +1 250 261 5517

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample (This de	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BEA	17 Oct 2022	17:15	Sediment	5	R	R			
	PD2			Sediment						
	PD3			Sediment						
	PD1			Sediment						
	POUCE	17 OCT 22	10:45	Sediment	5	R	R			
	PD4	17 Oct 22	13:40	Sediment	5	R	R			
	KR	17 Oct 22	15:25	Sediment	5	R	R			
				Sediment	5	R	R			
	PD5			Sediment			R			

FJAE Shipping & Receiving: Expedite / Priority / Call Out / Air / Ground; # of Coolers 1; # of Carboys

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

Note: 2 jars + 3 whirlpacks per site

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				
7.5								9

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: BM	Date: 17 Oct 2022	Time: 18:45	Received by:	Date: Oct 17/22	Time: 1850	Received by:	Date: 10/18	Time: 6:45

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202957**	Page	: 1 of 5
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.04	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day2	Issue Date	: 07-Jun-2023 10:06
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alex Thornton	Analyst	Metals, Burnaby, British Columbia
Colby Bingham	Laboratory Supervisor	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Jwan Abdalla	Laboratory Analyst	Sask Soils, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Accreditation

Accreditation	*Description*	*Laboratory*	*Address*
A	CALA ISO/IEC 17025:2017	SK Saskatoon - Environmental	819 58 Street East, Saskatoon, Saskatchewan
B	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.

Workorder Comments

Amendment (7/6/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Sarah Kennedy on 7/6/2023. All analysis results are as per the previous report.
Amendment (24/5/2023): This report has been amended to correct a holding time miscalculation for available N+N analysis.

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR3	MD	----	----	----
						Client sampling date / time	18-Oct-2022 09:30	18-Oct-2022 09:30	----	----	----
							FJ2202957-001	FJ2202957-002	--------	--------	--------
							Result	Result	----	----	----
Physical Tests											
pH (1:2 soil:water)	----	E108/VA	B	0.10	pH units		8.12	8.36	----	----	----
Particle Size											
Grain size curve	----	E185A/SK		-	-		See Attached	See Attached	----	----	----
Clay (<0.004mm)	----	EC184A/SK		1.0	%		7.5	7.7	----	----	----
Silt (0.063mm - 0.0312mm)	----	EC184A/SK		1.0	%		15.6	8.6	----	----	----
Silt (0.0312mm - 0.004mm)	----	EC184A/SK		1.0	%		17.6	10.3	----	----	----
Sand (0.125mm - 0.063mm)	----	EC184A/SK		1.0	%		22.1	15.6	----	----	----
Sand (0.25mm - 0.125mm)	----	EC184A/SK		1.0	%		25.5	39.0	----	----	----
Sand (0.5mm - 0.25mm)	----	EC184A/SK		1.0	%		7.5	17.4	----	----	----
Sand (1.0mm - 0.50mm)	----	EC184A/SK		1.0	%		1.6	1.3	----	----	----
Sand (2.0mm - 1.0mm)	----	EC184A/SK		1.0	%		1.2	<1.0	----	----	----
Gravel (>2mm)	----	EC184A/SK		1.0	%		1.4	<1.0	----	----	----
Anions and Nutrients											
Nitrogen, total	7727-37-9	E366/SK	A	0.020	%		0.080	0.058	----	----	----
Organic / Inorganic Carbon											
Carbon, total [TC]	----	E351/SK	A	0.050	%		1.69	1.55	----	----	----
Carbon, inorganic [IC]	----	E354/SK	A	0.050	%		0.637	0.564	----	----	----
Carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354/SK	A	0.40	%		5.31	4.70	----	----	----
Carbon, total organic [TOC]	----	EC356/SK		0.050	%		1.05	0.986	----	----	----
Organic matter	----	EC356/SK		0.10	%		1.81	1.70	----	----	----
Plant Available Nutrients											
Ammonium, available (as N)	14798-03-9	E312A/SK	A	1.0	mg/kg		4.8	1.3	----	----	----
Nitrate + Nitrite, available (as N)	----	E269.N+N/SK	A	1.0	mg/kg		<1.0	<1.0	----	----	----
Phosphate, available (as P)	14265-44-2	E384/SK	A	2.0	mg/kg		<2.0	<2.0	----	----	----
Nitrite, available (as N)	14797-65-0	E269.NO2/SK	A	0.40	mg/kg		<0.40	<0.40	----	----	----
Nitrate, available (as N)	14797-55-8	EC269.NO3/SK		2.0	mg/kg		<2.0	<2.0	----	----	----
Metals											

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab		LOR	Unit	Client sample ID	PR3	MD	----	----	----
						Client sampling date / time	18-Oct-2022 09:30	18-Oct-2022 09:30	----	----	----
							FJ2202957-001	FJ2202957-002	--------	--------	--------
							Result	Result	----	----	----
Metals											
Aluminum	7429-90-5	E440/VA	B	50	mg/kg		6280	5620	----	----	----
Antimony	7440-36-0	E440/VA	B	0.10	mg/kg		0.55	0.46	----	----	----
Arsenic	7440-38-2	E440/VA	B	0.10	mg/kg		7.64	6.47	----	----	----
Barium	7440-39-3	E440/VA	B	0.50	mg/kg		405	232	----	----	----
Beryllium	7440-41-7	E440/VA	B	0.10	mg/kg		0.46	0.36	----	----	----
Bismuth	7440-69-9	E440/VA	B	0.20	mg/kg		<0.20	<0.20	----	----	----
Boron	7440-42-8	E440/VA	B	5.0	mg/kg		8.3	5.1	----	----	----
Cadmium	7440-43-9	E440/VA	B	0.020	mg/kg		0.493	0.414	----	----	----
Calcium	7440-70-2	E440/VA	B	50	mg/kg		18200	14700	----	----	----
Chromium	7440-47-3	E440/VA	B	0.50	mg/kg		14.2	12.1	----	----	----
Cobalt	7440-48-4	E440/VA	B	0.10	mg/kg		5.50	6.37	----	----	----
Copper	7440-50-8	E440/VA	B	0.50	mg/kg		12.4	12.4	----	----	----
Iron	7439-89-6	E440/VA	B	50	mg/kg		15600	14900	----	----	----
Lead	7439-92-1	E440/VA	B	0.50	mg/kg		6.84	6.13	----	----	----
Lithium	7439-93-2	E440/VA	B	2.0	mg/kg		8.4	7.8	----	----	----
Magnesium	7439-95-4	E440/VA	B	20	mg/kg		5540	4330	----	----	----
Manganese	7439-96-5	E440/VA	B	1.0	mg/kg		182	270	----	----	----
Mercury	7439-97-6	E510/VA	B	0.0500	mg/kg		<0.0500	<0.0500	----	----	----
Molybdenum	7439-98-7	E440/VA	B	0.10	mg/kg		1.82	1.21	----	----	----
Nickel	7440-02-0	E440/VA	B	0.50	mg/kg		17.9	20.8	----	----	----
Phosphorus	7723-14-0	E440/VA	B	50	mg/kg		714	572	----	----	----
Potassium	7440-09-7	E440/VA	B	100	mg/kg		1380	1080	----	----	----
Selenium	7782-49-2	E440/VA	B	0.20	mg/kg		0.65	0.45	----	----	----
Silver	7440-22-4	E440/VA	B	0.10	mg/kg		0.13	<0.10	----	----	----
Sodium	7440-23-5	E440/VA	B	50	mg/kg		97	78	----	----	----
Strontium	7440-24-6	E440/VA	B	0.50	mg/kg		56.0	43.7	----	----	----
Sulfur	7704-34-9	E440/VA	B	1000	mg/kg		1200	<1000	----	----	----
Thallium	7440-28-0	E440/VA	B	0.050	mg/kg		0.131	0.102	----	----	----
Tin	7440-31-5	E440/VA	B	2.0	mg/kg		<2.0	<2.0	----	----	----
Titanium	7440-32-6	E440/VA	B	1.0	mg/kg		30.8	58.3	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	PR3	MD	----	----	----
					Client sampling date / time	18-Oct-2022 09:30	18-Oct-2022 09:30	----	----	----
Analyte	CAS Number	Method/Lab		LOR	Unit	FJ2202957-001	FJ2202957-002	--------	--------	--------
						Result	Result	----	----	----
Metals										
Tungsten	7440-33-7	E440/VA	B	0.50	mg/kg	<0.50	<0.50	----	----	----
Uranium	7440-61-1	E440/VA	B	0.050	mg/kg	0.851	0.526	----	----	----
Vanadium	7440-62-2	E440/VA	B	0.20	mg/kg	30.4	26.3	----	----	----
Zinc	7440-66-6	E440/VA	B	2.0	mg/kg	68.2	56.8	----	----	----
Zirconium	7440-67-7	E440/VA	B	1.0	mg/kg	1.7	1.9	----	----	----

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	: **FJ2202957**	Page	: 1 of 10
Amendment	: **2**		
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.04	Issue Date	: 07-Jun-2023 10:06
C-O-C number	: 2022-OCT-SEDMON8/9-Day2		
Sampler	: PD		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Metals	QC-MRG2-714059002	----	Iron	7439-89-6	E440	79.7 % MES	80.0-120%	Recovery less than lower control limit
Metals	QC-MRG2-714059002	----	Silver	7440-22-4	E440	79.6 % MES	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag MD	E366	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PR3	E366	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	28 days	5 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap MD	E510	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PR3	E510	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap MD	E440	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap PR3	E440	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	9 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag MD	E351	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag PR3	E351	18-Oct-2022	23-Oct-2022	----	----		23-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag MD	E354	18-Oct-2022	----	----	----		25-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PR3	E354	18-Oct-2022	----	----	----		25-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag MD	E185A	18-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PR3	E185A	18-Oct-2022	----	----	----		28-Oct-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap MD	E108	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PR3	E108	18-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	30 days	9 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag MD	E312A	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PR3	E312A	18-Oct-2022	24-Oct-2022	----	----		24-Oct-2022	60 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag MD	E269.N+N	18-Oct-2022	25-Oct-2022	180 days	7 days	✓	25-Oct-2022	3 days	0 days	✓
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PR3	E269.N+N	18-Oct-2022	25-Oct-2022	180 days	7 days	✓	25-Oct-2022	3 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag MD	E269.NO2	18-Oct-2022	25-Oct-2022	180 days	7 days	✓	25-Oct-2022	3 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PR3	E269.NO2	18-Oct-2022	25-Oct-2022	180 days	7 days	✓	25-Oct-2022	3 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag MD	E384	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PR3	E384	18-Oct-2022	25-Oct-2022	----	----		25-Oct-2022	180 days	0 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: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	1	20	5.0	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	1	13	7.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	1	7	14.2	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	1	14	7.1	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	1	14	7.1	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	714061	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	1	18	5.5	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	1	16	6.2	5.0	✓
Total Nitrogen by Combustion	E366	710369	1	6	16.6	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	2	20	10.0	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	2	13	15.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	2	7	28.5	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	2	20	10.0	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	2	14	14.2	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	2	14	14.2	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	714061	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	2	18	11.1	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	2	16	12.5	10.0	✓
Total Nitrogen by Combustion	E366	710369	2	6	33.3	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	711093	1	20	5.0	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	712215	1	13	7.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	712214	1	7	14.2	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	712225	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	714059	1	14	7.1	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	714060	1	14	7.1	5.0	✓
Total Carbon by Combustion	E351	710368	1	18	5.5	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	712868	1	16	6.2	5.0	✓
Total Nitrogen by Combustion	E366	710369	1	6	16.6	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
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO2 B (mod)	Plant available nitrite is analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202957**	Page	: 1 of 10
Amendment	: **2**		
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 600 Comox Road Courtenay BC Canada V9N3P6	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 18-Oct-2022 16:30
PO	: 1200-25.03.04	Date Analysis Commenced	: 21-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day2	Issue Date	: 07-Jun-2023 10:06
Sampler	: PD ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) 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*
Alex Thornton	Analyst	Vancouver Metals, Burnaby, British Columbia
Colby Bingham	Laboratory Supervisor	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Laboratory Supervisor	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Jwan Abdalla	Laboratory Analyst	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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: **Soil/Solid**

					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: 714061)											
FJ2202947-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	6.35	6.34	0.2%	5%	----
Anions and Nutrients (QC Lot: 710369)											
FJ2202948-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.020	%	0.048	0.052	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 710368)											
FJ2202948-001	Anonymous	Carbon, total [TC]	----	E351	0.050	%	0.644	0.620	3.80%	20%	----
Organic / Inorganic Carbon (QC Lot: 712868)											
FJ2202948-001	Anonymous	Carbon, inorganic [IC]	----	E354	0.050	%	0.138	0.138	0.0001	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 711093)											
EO2208821-007	Anonymous	Ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	1.3	1.3	0.06	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712214)											
FJ2202957-002	MD	Nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712215)											
FJ2202957-002	MD	Nitrate + Nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 712225)											
SK2205969-018	Anonymous	Phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	28.7	28.4	1.30%	30%	----
Metals (QC Lot: 714059)											
FJ2202947-001	Anonymous	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 714060)											
FJ2202947-001	Anonymous	Aluminum	7429-90-5	E440	50	mg/kg	9520	8700	9.06%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.29	0.27	0.02	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	4.86	4.31	12.0%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	390	339	14.1%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.45	0.37	0.08	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	6.8	5.6	1.2	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.792	0.655	18.9%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	4220	3690	13.6%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	19.4	18.1	7.10%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	7.03	6.19	12.7%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	11.9	10.8	9.45%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 714060) - continued											
FJ2202947-001	Anonymous	Iron	7439-89-6	E440	50	mg/kg	17800	16600	6.90%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	8.04	7.19	11.1%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	12.2	11.0	1.2	Diff <2x LOR	----
		Magnesium	7439-95-4	E440	20	mg/kg	2600	2500	3.84%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	466	361	25.4%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.70	0.66	5.01%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	21.8	20.5	6.21%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	801	683	15.9%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	1560	1410	10.0%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.39	0.27	0.12	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.27	0.23	0.04	Diff <2x LOR	----
		Sodium	7440-23-5	E440	50	mg/kg	50	<50	0.2	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	24.3	22.0	9.62%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.138	0.122	0.016	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Titanium	7440-32-6	E440	1.0	mg/kg	118	115	2.69%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.506	0.478	5.65%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	37.9	34.4	9.75%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	87.2	74.3	16.0%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 710369)						
Nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 710368)						
Carbon, total [TC]	----	E351	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 712868)						
Carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 711093)						
Ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 712214)						
Nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 712215)						
Nitrate + Nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 712225)						
Phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 714059)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 714060)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Calcium	7440-70-2	E440	50	mg/kg	<50	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Lithium	7439-93-2	E440	2	mg/kg	<2.0	----
Magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 714060) - continued						
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Phosphorus	7723-14-0	E440	50	mg/kg	<50	----
Potassium	7440-09-7	E440	100	mg/kg	<100	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Sodium	7440-23-5	E440	50	mg/kg	<50	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 714061)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.5	95.0	105	----
Anions and Nutrients (QCLot: 710369)									
Nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	99.8	90.0	110	----
Organic / Inorganic Carbon (QCLot: 710368)									
Carbon, total [TC]	----	E351	0.05	%	48 %	101	90.0	110	----
Organic / Inorganic Carbon (QCLot: 712868)									
Carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	93.3	90.0	110	----
Plant Available Nutrients (QCLot: 711093)									
Ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	102	80.0	120	----
Plant Available Nutrients (QCLot: 712214)									
Nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	107	70.0	130	----
Plant Available Nutrients (QCLot: 712215)									
Nitrate + Nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	108	70.0	130	----
Plant Available Nutrients (QCLot: 712225)									
Phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	100	80.0	120	----
Metals (QCLot: 714059)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	89.6	80.0	120	----
Metals (QCLot: 714060)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	86.4	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	98.3	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	90.5	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	88.2	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	92.9	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	93.2	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	83.2	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	85.7	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	87.7	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	86.1	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	85.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 714060) - continued									
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	85.2	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	# 79.7	80.0	120	MES
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	90.4	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	94.5	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	89.3	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	88.2	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	91.8	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	85.7	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	90.3	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	87.2	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	90.3	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	# 79.6	80.0	120	MES
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	90.8	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	90.8	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.4	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	96.6	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	85.6	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	84.5	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	87.1	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	84.3	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	88.0	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	85.5	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	86.9	80.0	120	----

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).*

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 710369)									
	RM	Nitrogen, total	7727-37-9	E366	0.11 %	110	80.0	120	----
Organic / Inorganic Carbon (QCLot: 710368)									
	RM	Carbon, total [TC]	----	E351	1.4 %	104	80.0	120	----
Organic / Inorganic Carbon (QCLot: 712868)									
	RM	Carbon, inorganic [IC]	----	E354	0.383 %	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 711093)									
	RM	Ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	99.5	80.0	120	----
Plant Available Nutrients (QCLot: 712214)									
	RM	Nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	57.6	0	570	----
Plant Available Nutrients (QCLot: 712215)									
	RM	Nitrate + Nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	84.4	70.0	130	----
Plant Available Nutrients (QCLot: 712225)									
	RM	Phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	101	80.0	120	----
Metals (QCLot: 714059)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	91.2	70.0	130	----
Metals (QCLot: 714060)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	90.9	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	86.9	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	85.4	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	90.1	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	116	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	80.3	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	95.6	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	101	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	86.8	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	83.9	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	87.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 714060) - continued									
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	95.2	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	104	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	92.4	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	95.3	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	89.5	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	88.2	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	86.8	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	102	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	95.0	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	90.5	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	93.8	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	81.7	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	105	70.0	130	----
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	91.0	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	85.1	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	84.3	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

ALS Lab Work Order # (ALS use only):

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sean Zhang **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

NUMBER OF CONTAINERS

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	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLE LSD ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PC1-A~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PC1-B~~			~~Sediment~~	~~2~~ 5	R	R			
	~~RR1-A~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR1-B~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR2~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR2-FB~~			~~Water~~	~~2~~ 5	R	R			
	~~HD~~			~~Sediment~~	~~2~~ 5	R	R			
	PR-2.81	18 OCT 22	09:30	Sediment	5	R	R			
	MD	18 OCT 22	11:30	Sediment	5	R	R			

FJAE Shipping & Receiving
Call Out Expedite
Priority
1 # of Coolers ✓ Air
# of Carboys Ground

Fort St. John
Work Order Reference
FJ2202957

Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
8.2							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
	Oct 18, 2022	16:35

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	OCT 18-22	4:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sean Zhang Sampler: Pat Beaupre

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	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLE ARCHIVE HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PC1-A~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PC1-B~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR1-A~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR1-B~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR2~~			~~Sediment~~	~~2~~ 5	R	R			
	~~PR2-FB~~			~~Water~~	~~2~~ 5	R	R			
	~~HB~~			~~Sediment~~	~~2~~ 5	R	R			
	PR-2.81	18 OCT 22	09:30	Sediment	5	R	R			
	MD	18 OCT 22	11:30	Sediment	5	R	R			

FJAE Shipping & Receiving
___ Call Out ___ Expedite
___ Priority
1 # of Coolers ✓ Air
___ # of Carboys ___ Ground

Fort St. John
Work Order Reference
FJ2202957

Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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
8.2°	GL

SHIPMENT RELEASE (client use)

Released by: Date: Oct 18, 2022 Time: 16:35

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Oct 18-22 Time: 4:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: OCT 19 2022 Time: 5:45

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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**.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2203013**	Page	: 1 of 5
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 1	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: W1	D1	----	----	----
					Client sampling date / time: 19-Oct-2022 16:45	19-Oct-2022 11:50	----	----	----
					FJ2203013-001	FJ2203013-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
pH (1:2 soil:water)	----	E108	0.10	pH units	8.27	8.14	----	----	----
Particle Size									
grain size curve	----	E185A	-	-	See Attached	See Attached	----	----	----
clay (<0.004mm)	----	EC184A	1.0	%	12.8	15.2	----	----	----
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%	26.3	24.9	----	----	----
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%	56.2	49.0	----	----	----
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%	4.4	6.6	----	----	----
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%	<1.0	2.5	----	----	----
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%	<1.0	1.0	----	----	----
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
gravel (>2mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
Anions and Nutrients									
nitrogen, total	7727-37-9	E366	0.020	%	0.046	0.113	----	----	----
Organic / Inorganic Carbon									
carbon, total [TC]	----	E351	0.050	%	3.64	2.59	----	----	----
carbon, inorganic [IC]	----	E354	0.050	%	2.89	1.16	----	----	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%	24.1	9.68	----	----	----
carbon, total organic [TOC]	----	EC356	0.050	%	0.750	1.43	----	----	----
organic matter	----	EC356	0.10	%	1.29	2.46	----	----	----
Plant Available Nutrients									
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	<1.0	3.6	----	----	----
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<2.5 DLM	<2.5 DLM	----	----	----
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	<2.0	<2.0	----	----	----
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.99 DLM	<0.98 DLM	----	----	----
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg	<2.5	<2.5	----	----	----
Metals									
aluminum	7429-90-5	E440	50	mg/kg	8470	8640	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	W1	D1	----	----	----
					Client sampling date / time	19-Oct-2022 16:45	19-Oct-2022 11:50	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203013-001	FJ2203013-002	--------	--------	--------
						Result	Result	----	----	----
Metals										
antimony	7440-36-0	E440	0.10	mg/kg		0.94	0.81	----	----	----
arsenic	7440-38-2	E440	0.10	mg/kg		6.22	7.16	----	----	----
barium	7440-39-3	E440	0.50	mg/kg		134	356	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg		0.34	0.45	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	<0.20	----	----	----
boron	7440-42-8	E440	5.0	mg/kg		<5.0	7.2	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg		1.47	1.00	----	----	----
calcium	7440-70-2	E440	50	mg/kg		75700	27800	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg		21.4	20.6	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg		6.72	6.86	----	----	----
copper	7440-50-8	E440	0.50	mg/kg		17.5	19.0	----	----	----
iron	7439-89-6	E440	50	mg/kg		19800	19300	----	----	----
lead	7439-92-1	E440	0.50	mg/kg		7.60	9.32	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg		15.7	13.2	----	----	----
magnesium	7439-95-4	E440	20	mg/kg		20500	12200	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg		357	257	----	----	----
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	0.0627	----	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg		1.36	1.09	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg		23.4	25.4	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg		747	813	----	----	----
potassium	7440-09-7	E440	100	mg/kg		960	1570	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg		0.37	0.72	----	----	----
silver	7440-22-4	E440	0.10	mg/kg		<0.10	0.20	----	----	----
sodium	7440-23-5	E440	50	mg/kg		108	100	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg		138	63.4	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg		<1000	<1000	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg		0.219	0.208	----	----	----
tin	7440-31-5	E440	2.0	mg/kg		<2.0	<2.0	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg		268	124	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	<0.50	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	W1	D1	----	----	----
					Client sampling date / time	19-Oct-2022 16:45	19-Oct-2022 11:50	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203013-001	FJ2203013-002	--------	--------	--------
						Result	Result	----	----	----
Metals										
uranium	7440-61-1	E440	0.050	mg/kg		0.853	0.918	----	----	----
vanadium	7440-62-2	E440	0.20	mg/kg		44.1	42.6	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg		76.3	85.3	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg		3.3	1.4	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2203013**	Page	: 1 of 9
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Issue Date	: 01-Nov-2022 12:11
C-O-C number	: 2022-OCT-SEDMON8/9-Day 1		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No 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: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag D1	E366	19-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	10 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag W1	E366	19-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap W1	E510	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap D1	E510	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap D1	E440	19-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap W1	E440	19-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	9 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag D1	E351	19-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag W1	E351	19-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag D1	E354	19-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag W1	E354	19-Oct-2022	----	----	----		29-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag D1	E185A	19-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag W1	E185A	19-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap W1	E108	19-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	8 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap D1	E108	19-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	9 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag D1	E312A	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag W1	E312A	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag D1	E269.N+N	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	9 days	× EHTL
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag W1	E269.N+N	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	9 days	× EHTL
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag D1	E269.NO2	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag W1	E269.NO2	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag D1	E384	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	9 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag W1	E384	19-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	9 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: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	2	19	10.5	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	2	15	13.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	2	13	15.3	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	2	15	13.3	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	2	18	11.1	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	2	18	11.1	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	2	16	12.5	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	2	19	10.5	10.0	✓
Total Nitrogen by Combustion	E366	721798	2	16	12.5	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrite is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2203013**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 1	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) 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*
Colby Bingham	Quality Systems Coordinator	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					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: 716772)											
FJ2202995-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.20	8.25	0.6%	5%	----
Anions and Nutrients (QC Lot: 721798)											
FJ2203010-005	Anonymous	nitrogen, total	7727-37-9	E366	0.020	%	0.089	0.085	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 721422)											
CG2214915-003	Anonymous	carbon, inorganic [IC]	----	E354	0.050	%	2.08	2.16	3.60%	20%	----
Organic / Inorganic Carbon (QC Lot: 721797)											
FJ2203010-005	Anonymous	carbon, total [TC]	----	E351	0.050	%	2.75	2.82	2.65%	20%	----
Plant Available Nutrients (QC Lot: 718419)											
FJ2203010-003	Anonymous	ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	8.8	9.0	0.1	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718694)											
FJ2203010-003	Anonymous	nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718695)											
FJ2203010-003	Anonymous	nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 719784)											
KS2204037-001	Anonymous	phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	6.2	6.9	0.7	Diff <2x LOR	----
Metals (QC Lot: 716768)											
FJ2202995-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 716769)											
FJ2202995-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	5060	4240	17.4%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.59	0.52	0.07	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	6.36	6.16	3.32%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	420	381	9.54%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.34	0.34	0.0010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	5.7	<5.0	0.7	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.419	0.397	5.55%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	18700	17300	7.85%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	12.3	9.86	21.9%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	5.35	5.04	5.90%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	10.4	9.66	7.34%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 716769) - continued											
FJ2202995-001	Anonymous	iron	7439-89-6	E440	50	mg/kg	15300	14000	9.21%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	7.19	6.33	12.7%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	7.9	6.8	1.1	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	5180	4940	4.75%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	190	176	8.00%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.18	1.09	8.01%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	17.7	16.5	6.73%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	693	705	1.68%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	980	800	20.1%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.48	0.40	0.08	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.12	0.10	0.02	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	67	60	7	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	54.5	48.4	11.8%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.118	0.099	0.019	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	38.1	28.6	28.4%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.795	0.720	9.92%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	25.5	21.4	17.4%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	63.0	57.2	9.74%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.0	1.7	0.2	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: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 721798)						
nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 721422)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 721797)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 718419)						
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 718694)						
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 718695)						
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 719784)						
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 716768)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 716769)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 716769) - continued						
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 716772)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.3	95.0	105	----
Anions and Nutrients (QCLot: 721798)									
nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721422)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	94.3	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721797)									
carbon, total [TC]	----	E351	0.05	%	48 %	101	90.0	110	----
Plant Available Nutrients (QCLot: 718419)									
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	100	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	102	70.0	130	----
Plant Available Nutrients (QCLot: 718695)									
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	99.2	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	92.7	80.0	120	----
Metals (QCLot: 716768)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 716769)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	91.5	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	94.7	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	89.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	107	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	87.6	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	91.0	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	89.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	89.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	88.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	87.3	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	82.5	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.8	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	97.2	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	90.3	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	86.3	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	93.1	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	86.8	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	91.0	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	91.6	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	93.9	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	85.6	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	96.1	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	91.4	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	106	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	89.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	85.7	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	89.4	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	97.7	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	90.6	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	86.8	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	103	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 721798)									
	RM	nitrogen, total	7727-37-9	E366	0.11 %	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721422)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	106	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721797)									
	RM	carbon, total [TC]	----	E351	1.4 %	104	80.0	120	----
Plant Available Nutrients (QCLot: 718419)									
	RM	ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
	RM	nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	56.4	0	570	----
Plant Available Nutrients (QCLot: 718695)									
	RM	nitrate + nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	91.7	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
	RM	phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	102	80.0	120	----
Metals (QCLot: 716768)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	107	70.0	130	----
Metals (QCLot: 716769)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	89.9	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	93.8	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	89.9	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	96.7	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	106	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	87.1	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	93.4	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	97.9	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	88.5	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	88.5	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	88.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	99.9	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	89.2	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	89.5	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	88.0	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	85.8	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	99.3	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	91.1	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	97.4	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	91.3	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	90.4	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	99.9	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	95.8	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	85.0	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	95.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

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 minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Sean Zhang

Sampler: Pat Beaupre

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	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1	19 OCT 22	16:45	Sediment	5	R	R			
	D1	19 OCT 22	11:50	Sediment	5	R	R			

FJAE Shipping & Receiving
Call Out Expedite
Priority
1 # of Coolers ✓ Air
# of Carboys Ground

Fort St. John
Work Order Reference
FJ2203013

Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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
12.3	

SHIPMENT RELEASE (client use)

Released by: Date: Oct 19, 2022 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Oct 22/22 Time: 13:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com
Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA22-ECOF100-004	AFE/Cost Center:	PO#:
Job #:	Sediment for MON8/9	Major/Minor Code:	Routing Code:
PO / AFE:	1200-25.03.04	Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact: Sean Zhang	Sampler: Pat Beaupre

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	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	W1	19 OCT 22	16:45	Sediment	5	R	R			
	D1	19 OCT 22	11:50	Sediment	5	R	R			

Fort St. John
Work Order Reference
FJ2203013

Telephone : - 1 250 261 5517

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	Please send Azimuth a copy of the data in their EDD format:
Are samples for human consumption/ use? ☐ YES ☑ NO	csuzanne@ecofishresearch.com kgainshorn@ecofishresearch.com

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				9.0 (avg 5)			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date: Oct 19, 2022	Time:	Received by:	Date: Oct 22/22	Time: 13:00	Received by: M.C	Date: 10 24 22	Time: 11:15

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**.

PM

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2202995**	Page	: 1 of 5
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 20-Oct-2022 15:29
PO	: 1200-25.03.04	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia
Xihua Yao	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Xihua Yao	Laboratory Analyst	Sask Soils, Saskatoon, Saskatchewan

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 Unit
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD2	PD3	PD5	----	----
					Client sampling date / time	20-Oct-2022 14:00	20-Oct-2022 12:10	20-Oct-2022 08:15	----	----
						FJ2202995-001	FJ2202995-002	FJ2202995-003	--------	--------
						Result	Result	Result	----	----
Physical Tests										
pH (1:2 soil:water)	----	E108	0.10	pH units		8.20	8.07	7.96	----	----
Particle Size										
grain size curve	----	E185A	-	-		See Attached	See Attached	See Attached	----	----
clay (<0.004mm)	----	EC184A	1.0	%		4.8	6.6	12.7	----	----
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%		16.9	20.8	30.6	----	----
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%		11.8	19.2	37.5	----	----
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%		38.3	31.9	18.6	----	----
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%		27.6	21.2	<1.0	----	----
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%		<1.0	<1.0	<1.0	----	----
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%		<1.0	<1.0	<1.0	----	----
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%		<1.0	<1.0	<1.0	----	----
gravel (>2mm)	----	EC184A	1.0	%		<1.0	<1.0	<1.0	----	----
Anions and Nutrients										
nitrogen, total	7727-37-9	E366	0.020	%		0.064	0.089	0.119	----	----
Organic / Inorganic Carbon										
carbon, total [TC]	----	E351	0.050	%		1.39	1.85	2.11	----	----
carbon, inorganic [IC]	----	E354	0.050	%		0.538	0.570	0.604	----	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%		4.48	4.75	5.03	----	----
carbon, total organic [TOC]	----	EC356	0.050	%		0.852	1.28	1.51	----	----
organic matter	----	EC356	0.10	%		1.47	2.21	2.60	----	----
Plant Available Nutrients										
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg		3.4	10.4	10.4	----	----
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg		<1.0	<1.0	<1.0	----	----
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg		<2.0	<2.0	<2.0	----	----
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg		<0.40	<0.40	<0.40	----	----
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg		<2.0	<2.0	<2.0	----	----
Metals										
aluminum	7429-90-5	E440	50	mg/kg		5060	5210	6310	----	----

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PD2	PD3	PD5	----	----
					Client sampling date / time	20-Oct-2022 14:00	20-Oct-2022 12:10	20-Oct-2022 08:15	----	----
						FJ2202995-001	FJ2202995-002	FJ2202995-003	--------	--------
						Result	Result	Result	----	----
Metals										
antimony	7440-36-0	E440	0.10	mg/kg		0.59	0.57	0.59	----	----
arsenic	7440-38-2	E440	0.10	mg/kg		6.36	6.81	7.12	----	----
barium	7440-39-3	E440	0.50	mg/kg		420	418	446	----	----
beryllium	7440-41-7	E440	0.10	mg/kg		0.34	0.33	0.44	----	----
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	<0.20	<0.20	----	----
boron	7440-42-8	E440	5.0	mg/kg		5.7	5.3	5.0	----	----
cadmium	7440-43-9	E440	0.020	mg/kg		0.419	0.539	0.626	----	----
calcium	7440-70-2	E440	50	mg/kg		18700	17100	16500	----	----
chromium	7440-47-3	E440	0.50	mg/kg		12.3	11.8	14.1	----	----
cobalt	7440-48-4	E440	0.10	mg/kg		5.35	5.96	7.06	----	----
copper	7440-50-8	E440	0.50	mg/kg		10.4	12.6	15.8	----	----
iron	7439-89-6	E440	50	mg/kg		15300	15600	17200	----	----
lead	7439-92-1	E440	0.50	mg/kg		7.19	7.16	8.43	----	----
lithium	7439-93-2	E440	2.0	mg/kg		7.9	7.9	10.6	----	----
magnesium	7439-95-4	E440	20	mg/kg		5180	5480	6150	----	----
manganese	7439-96-5	E440	1.0	mg/kg		190	208	243	----	----
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	<0.0500	0.0572	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg		1.18	1.18	1.14	----	----
nickel	7440-02-0	E440	0.50	mg/kg		17.7	19.5	22.4	----	----
phosphorus	7723-14-0	E440	50	mg/kg		693	725	716	----	----
potassium	7440-09-7	E440	100	mg/kg		980	930	1060	----	----
selenium	7782-49-2	E440	0.20	mg/kg		0.48	0.50	0.69	----	----
silver	7440-22-4	E440	0.10	mg/kg		0.12	0.13	0.18	----	----
sodium	7440-23-5	E440	50	mg/kg		67	66	73	----	----
strontium	7440-24-6	E440	0.50	mg/kg		54.5	49.2	49.8	----	----
sulfur	7704-34-9	E440	1000	mg/kg		<1000	<1000	1200	----	----
thallium	7440-28-0	E440	0.050	mg/kg		0.118	0.131	0.155	----	----
tin	7440-31-5	E440	2.0	mg/kg		<2.0	<2.0	<2.0	----	----
titanium	7440-32-6	E440	1.0	mg/kg		38.1	32.0	18.1	----	----
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	<0.50	<0.50	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	PD2	PD3	PD5	----	----
					Client sampling date / time	20-Oct-2022 14:00	20-Oct-2022 12:10	20-Oct-2022 08:15	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2202995-001	FJ2202995-002	FJ2202995-003	--------	--------
						Result	Result	Result	----	----
Metals										
uranium	7440-61-1	E440	0.050	mg/kg		0.795	0.756	0.854	----	----
vanadium	7440-62-2	E440	0.20	mg/kg		25.5	24.8	27.6	----	----
zinc	7440-66-6	E440	2.0	mg/kg		63.0	67.6	79.8	----	----
zirconium	7440-67-7	E440	1.0	mg/kg		2.0	1.8	2.1	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2202995**	Page	: 1 of 10
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 20-Oct-2022 15:29
PO	: 1200-25.03.04	Issue Date	: 01-Nov-2022 12:11
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3		
Sampler	: PB		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PD2	E366	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PD3	E366	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PD5	E366	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PD2	E510	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PD3	E510	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PD5	E510	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap PD2	E440	20-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	9 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap PD3	E440	20-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	9 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap PD5	E440	20-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	9 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag PD2	E351	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag PD3	E351	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag PD5	E351	20-Oct-2022	27-Oct-2022	----	----		27-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PD2	E354	20-Oct-2022	----	----	----		28-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PD3	E354	20-Oct-2022	----	----	----		28-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PD5	E354	20-Oct-2022	----	----	----		28-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PD2	E185A	20-Oct-2022	----	----	----		01-Nov-2022	365 days	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PD3	E185A	20-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PD5	E185A	20-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PD2	E108	20-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PD3	E108	20-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PD5	E108	20-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	8 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PD2	E312A	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PD3	E312A	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PD5	E312A	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PD2	E269.N+N	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	8 days	× EHT

Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PD3	E269.N+N	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	8 days	✖ EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PD5	E269.N+N	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	8 days	✖ EHT
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PD2	E269.NO2	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PD3	E269.NO2	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PD5	E269.NO2	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PD2	E384	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	8 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PD3	E384	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	8 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PD5	E384	20-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	8 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: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	718725	1	12	8.3	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	719760	1	18	5.5	5.0	✓
Total Nitrogen by Combustion	E366	718726	1	13	7.6	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	2	19	10.5	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	2	15	13.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	2	13	15.3	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	2	15	13.3	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	2	18	11.1	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	2	18	11.1	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	718725	2	12	16.6	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	719760	2	18	11.1	10.0	✓
Total Nitrogen by Combustion	E366	718726	2	13	15.3	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
Total Carbon by Combustion	E351	718725	1	12	8.3	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	719760	1	18	5.5	5.0	✓
Total Nitrogen by Combustion	E366	718726	1	13	7.6	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
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrite is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2202995**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 20-Oct-2022 15:29
PO	: 1200-25.03.04	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB ----		
Site	: Site C RSEM Water Quality Monitoring		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 3		
No. of samples analysed	: 3		

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
- Reference Material (RM) 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*
Colby Bingham	Quality Systems Coordinator	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Xihua Yao	Laboratory Analyst	Saskatoon Inorganics, Saskatoon, Saskatchewan
Xihua Yao	Laboratory Analyst	Saskatoon Sask Soils, Saskatoon, Saskatchewan

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: **Soil/Solid**

					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: 716772)											
FJ2202995-001	PD2	pH (1:2 soil:water)	----	E108	0.10	pH units	8.20	8.25	0.6%	5%	----
Anions and Nutrients (QC Lot: 718726)											
VA22C5596-021	Anonymous	nitrogen, total	7727-37-9	E366	0.020	%	0.497	0.524	5.29%	20%	----
Organic / Inorganic Carbon (QC Lot: 718725)											
VA22C5596-021	Anonymous	carbon, total [TC]	----	E351	0.050	%	5.51	5.92	7.16%	20%	----
Organic / Inorganic Carbon (QC Lot: 719760)											
CG2214785-001	Anonymous	carbon, inorganic [IC]	----	E354	0.050	%	0.257	0.254	0.003	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718419)											
FJ2203010-003	Anonymous	ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	8.8	9.0	0.1	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718694)											
FJ2203010-003	Anonymous	nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718695)											
FJ2203010-003	Anonymous	nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 719784)											
KS2204037-001	Anonymous	phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	6.2	6.9	0.7	Diff <2x LOR	----
Metals (QC Lot: 716768)											
FJ2202995-001	PD2	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 716769)											
FJ2202995-001	PD2	aluminum	7429-90-5	E440	50	mg/kg	5060	4240	17.4%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.59	0.52	0.07	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	6.36	6.16	3.32%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	420	381	9.54%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.34	0.34	0.0010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	5.7	<5.0	0.7	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.419	0.397	5.55%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	18700	17300	7.85%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	12.3	9.86	21.9%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	5.35	5.04	5.90%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	10.4	9.66	7.34%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 716769) - continued											
FJ2202995-001	PD2	iron	7439-89-6	E440	50	mg/kg	15300	14000	9.21%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	7.19	6.33	12.7%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	7.9	6.8	1.1	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	5180	4940	4.75%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	190	176	8.00%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.18	1.09	8.01%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	17.7	16.5	6.73%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	693	705	1.68%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	980	800	20.1%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.48	0.40	0.08	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.12	0.10	0.02	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	67	60	7	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	54.5	48.4	11.8%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.118	0.099	0.019	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	38.1	28.6	28.4%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.795	0.720	9.92%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	25.5	21.4	17.4%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	63.0	57.2	9.74%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.0	1.7	0.2	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: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 718726)						
nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 718725)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 719760)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 718419)						
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 718694)						
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 718695)						
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 719784)						
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 716768)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 716769)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 716769) - continued						
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 716772)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.3	95.0	105	----
Anions and Nutrients (QCLot: 718726)									
nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	102	90.0	110	----
Organic / Inorganic Carbon (QCLot: 718725)									
carbon, total [TC]	----	E351	0.05	%	48 %	103	90.0	110	----
Organic / Inorganic Carbon (QCLot: 719760)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	95.1	90.0	110	----
Plant Available Nutrients (QCLot: 718419)									
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	100	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	102	70.0	130	----
Plant Available Nutrients (QCLot: 718695)									
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	99.2	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	92.7	80.0	120	----
Metals (QCLot: 716768)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 716769)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	91.5	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	94.7	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	89.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	107	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	87.6	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	91.0	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	89.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	89.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	88.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	87.3	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	82.5	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.8	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	97.2	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	90.3	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	86.3	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	93.1	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	86.8	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	91.0	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	91.6	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	93.9	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	85.6	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	96.1	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	91.4	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	106	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	89.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	85.7	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	89.4	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	97.7	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	90.6	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	86.8	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	103	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 718726)									
	RM	nitrogen, total	7727-37-9	E366	0.11 %	95.4	80.0	120	----
Organic / Inorganic Carbon (QCLot: 718725)									
	RM	carbon, total [TC]	----	E351	1.4 %	102	80.0	120	----
Organic / Inorganic Carbon (QCLot: 719760)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	95.1	80.0	120	----
Plant Available Nutrients (QCLot: 718419)									
	RM	ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
	RM	nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	56.4	0	570	----
Plant Available Nutrients (QCLot: 718695)									
	RM	nitrate + nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	91.7	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
	RM	phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	102	80.0	120	----
Metals (QCLot: 716768)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	107	70.0	130	----
Metals (QCLot: 716769)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	89.9	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	93.8	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	89.9	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	96.7	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	106	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	87.1	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	93.4	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	97.9	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	88.5	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	88.5	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	88.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	99.9	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	89.2	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	89.5	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	88.0	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	85.8	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	99.3	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	91.1	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	97.4	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	91.3	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	90.4	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	99.9	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	95.8	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	85.0	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	95.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information	
ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	
ALS Lab Work Order # (ALS use only):	

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#:

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~BEA~~	~~17-Oct-22~~	~~17:15~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	PD2	20 Oct 22	14:00	Sediment	2	R	R		
	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	~~PD1~~	~~[illegible]~~	~~[illegible]~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	~~POUCE~~	~~17 Oct 22~~	~~10:45~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	~~PD4~~	~~17 Oct 22~~	~~13:40~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	~~KR~~	~~17 Oct 22~~	~~15:25~~	~~Sediment~~	~~2~~	~~R~~	~~R~~		
	PD3	20 Oct 22	12:10	Sediment	5	R	R		
	PD5	20 Oct 22	08:15	Sediment	5	R	R		

Fort St. John
Work Order Reference
FJ2202995

FJAE Shipping & Receiving
___ Call Out ___ Expedite
___ Priority
1 # of Coolers ✓ Air
___ # of Carboys ___ Ground

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

Note: 2 jars + 3 whirlpacks per site

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			
6.6				7.7 °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	2022-10-20	15:20		10-20-22	3:29		Oct 21	17:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2203010**	Page	: 1 of 10
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 2	Issue Date	: 07-Nov-2022 13:17
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 8		
No. of samples analysed	: 7		

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*
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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*
-	No Unit
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
RRV	*Reported result verified by repeat analysis.*

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	21-Oct-2022 15:25	21-Oct-2022 15:25	21-Oct-2022 09:45	21-Oct-2022 09:45	21-Oct-2022 11:15
						FJ2203010-001	FJ2203010-002	FJ2203010-003	FJ2203010-004	FJ2203010-005
						Result	Result	Result	Result	Result
Physical Tests										
pH (1:2 soil:water)	----	E108	0.10	pH units		8.67	8.70	8.15	8.08	8.08
Particle Size										
grain size curve	----	E185A	-	-		See Attached	See Attached	See Attached	See Attached	See Attached
clay (<0.004mm)	----	EC184A	1.0	%		4.0	5.7	7.9	7.7	10.3
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%		2.8	4.1	35.9	36.1	21.6
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%		5.8	8.7	42.9	42.9	34.7
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%		1.8	2.5	12.5	12.6	9.0
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%		3.9	5.8	<1.0	<1.0	6.9
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%		4.8	8.0	<1.0	<1.0	17.3
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%		12.0	13.1	<1.0	<1.0	<1.0
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%		28.4	18.8	<1.0	<1.0	<1.0
gravel (>2mm)	----	EC184A	1.0	%		36.5	33.3	<1.0	<1.0	<1.0
Anions and Nutrients										
nitrogen, total	7727-37-9	E366	0.020	%		0.105	0.104	0.097	0.094	0.089
Organic / Inorganic Carbon										
carbon, total [TC]	----	E351	0.050	%		1.82	1.80	1.52	1.50	2.75
carbon, inorganic [IC]	----	E354	0.050	%		0.339	0.363	0.317	0.328	1.54
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%		2.82	3.03	2.64	2.73	12.8
carbon, total organic [TOC]	----	EC356	0.050	%		1.48	1.44	1.20	1.17	1.21
organic matter	----	EC356	0.10	%		2.55	2.48	2.07	2.02	2.09
Plant Available Nutrients										
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg		2.1	3.2	8.8	9.3	10.4
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg		<0.40	<0.40	<0.40	<0.40	<0.40
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Metals										
aluminum	7429-90-5	E440	50	mg/kg		12600	16400	6010	5940	6730

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	21-Oct-2022 15:25	21-Oct-2022 15:25	21-Oct-2022 09:45	21-Oct-2022 09:45	21-Oct-2022 11:15
						FJ2203010-001	FJ2203010-002	FJ2203010-003	FJ2203010-004	FJ2203010-005
						Result	Result	Result	Result	Result
Metals										
antimony	7440-36-0	E440	0.10	mg/kg		0.62	0.56	0.47	0.46	0.62
arsenic	7440-38-2	E440	0.10	mg/kg		8.34	8.04	5.86	5.86	5.36
barium	7440-39-3	E440	0.50	mg/kg		219	240	593	583	312
beryllium	7440-41-7	E440	0.10	mg/kg		0.52	0.64	0.36	0.37	0.31
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	0.23	<0.20	<0.20	<0.20
boron	7440-42-8	E440	5.0	mg/kg		8.5	9.9	6.8	6.8	7.1
cadmium	7440-43-9	E440	0.020	mg/kg		0.414	0.422	0.448	0.456	0.767
calcium	7440-70-2	E440	50	mg/kg		16800	11100	8430	8590	41400
chromium	7440-47-3	E440	0.50	mg/kg		29.1	35.0	12.4	12.5	16.0
cobalt	7440-48-4	E440	0.10	mg/kg		8.49	10.1	4.89	4.85	5.21
copper	7440-50-8	E440	0.50	mg/kg		32.0	42.4	12.3	12.1	12.4
iron	7439-89-6	E440	50	mg/kg		25100	29600	13000	13400	13800
lead	7439-92-1	E440	0.50	mg/kg		8.84	11.0	7.31	7.16	6.48
lithium	7439-93-2	E440	2.0	mg/kg		23.8	34.5	9.1	8.9	10.0
magnesium	7439-95-4	E440	20	mg/kg		9450	10700	3740	3710	11900
manganese	7439-96-5	E440	1.0	mg/kg		300	290	180	181	232
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	<0.0500	0.0599	0.0572	<0.0500
molybdenum	7439-98-7	E440	0.10	mg/kg		0.76	0.84	0.95	0.95	1.16
nickel	7440-02-0	E440	0.50	mg/kg		28.9	35.3	17.3	17.0	18.5
phosphorus	7723-14-0	E440	50	mg/kg		843	919	648	651	703
potassium	7440-09-7	E440	100	mg/kg		1820	2200	1410	1400	1220
selenium	7782-49-2	E440	0.20	mg/kg		0.36	0.36	0.58	0.49	0.51
silver	7440-22-4	E440	0.10	mg/kg		0.17	0.24	0.21	0.22	0.14
sodium	7440-23-5	E440	50	mg/kg		137	165	90	83	91
strontium	7440-24-6	E440	0.50	mg/kg		53.8	43.3	35.8	35.8	86.5
sulfur	7704-34-9	E440	1000	mg/kg		<1000	<1000	2100	2100	<1000
thallium	7440-28-0	E440	0.050	mg/kg		0.116	0.142	0.140	0.138	0.154
tin	7440-31-5	E440	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
titanium	7440-32-6	E440	1.0	mg/kg		100	47.2	21.7	20.4	120
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50	<0.50

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	PC1-A	PC1-B	PR1-A	PR1-B	PR2
					Client sampling date / time	21-Oct-2022 15:25	21-Oct-2022 15:25	21-Oct-2022 09:45	21-Oct-2022 09:45	21-Oct-2022 11:15
						FJ2203010-001	FJ2203010-002	FJ2203010-003	FJ2203010-004	FJ2203010-005
						Result	Result	Result	Result	Result
Metals										
uranium	7440-61-1	E440	0.050	mg/kg		0.614	0.611	0.777	0.775	0.769
vanadium	7440-62-2	E440	0.20	mg/kg		52.6	60.0	25.6	25.4	35.5
zinc	7440-66-6	E440	2.0	mg/kg		86.0	106	65.4	64.2	60.9
zirconium	7440-67-7	E440	1.0	mg/kg		2.1	2.0	1.3	1.2	1.9

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	HD	----	----	----	----
					Client sampling date / time	21-Oct-2022 12:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203010-007	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
pH (1:2 soil:water)	----	E108	0.10	pH units		8.22	----	----	----	----
Particle Size										
grain size curve	----	E185A	-	-		See Attached	----	----	----	----
clay (<0.004mm)	----	EC184A	1.0	%		13.5	----	----	----	----
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%		23.0	----	----	----	----
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%		27.9	----	----	----	----
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%		24.0	----	----	----	----
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%		9.9	----	----	----	----
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%		1.5	----	----	----	----
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%		<1.0	----	----	----	----
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%		<1.0	----	----	----	----
gravel (>2mm)	----	EC184A	1.0	%		<1.0	----	----	----	----
Anions and Nutrients										
nitrogen, total	7727-37-9	E366	0.020	%		0.113	----	----	----	----
Organic / Inorganic Carbon										
carbon, total [TC]	----	E351	0.050	%		2.32	----	----	----	----
carbon, inorganic [IC]	----	E354	0.050	%		0.829	----	----	----	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%		6.91	----	----	----	----
carbon, total organic [TOC]	----	EC356	0.050	%		1.49	----	----	----	----
organic matter	----	EC356	0.10	%		2.57	----	----	----	----
Plant Available Nutrients										
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg		2.6	----	----	----	----
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg		<1.0	----	----	----	----
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg		<2.0	----	----	----	----
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg		<0.40	----	----	----	----
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg		<2.0	----	----	----	----
Metals										
aluminum	7429-90-5	E440	50	mg/kg		7190	----	----	----	----
antimony	7440-36-0	E440	0.10	mg/kg		0.66	----	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	HD	----	----	----	----
					Client sampling date / time	21-Oct-2022 12:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203010-007	--------	--------	--------	--------
						Result	----	----	----	----
Metals										
arsenic	7440-38-2	E440	0.10	mg/kg		7.67	----	----	----	----
barium	7440-39-3	E440	0.50	mg/kg		483	----	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg		0.47	----	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	----	----	----	----
boron	7440-42-8	E440	5.0	mg/kg		8.2	----	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg		0.710	----	----	----	----
calcium	7440-70-2	E440	50	mg/kg		23500	----	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg		15.0	----	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg		7.07	----	----	----	----
copper	7440-50-8	E440	0.50	mg/kg		16.6	----	----	----	----
iron	7439-89-6	E440	50	mg/kg		15800	----	----	----	----
lead	7439-92-1	E440	0.50	mg/kg		7.93	----	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg		10.6	----	----	----	----
magnesium	7439-95-4	E440	20	mg/kg		6380	----	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg		229	----	----	----	----
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	----	----	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg		1.48	----	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg		21.6	----	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg		862	----	----	----	----
potassium	7440-09-7	E440	100	mg/kg		1440	----	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg		0.90	----	----	----	----
silver	7440-22-4	E440	0.10	mg/kg		0.18	----	----	----	----
sodium	7440-23-5	E440	50	mg/kg		96	----	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg		74.0	----	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg		<1000	----	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg		0.166	----	----	----	----
tin	7440-31-5	E440	2.0	mg/kg		<2.0	----	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg		22.8	----	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	----	----	----	----
uranium	7440-61-1	E440	0.050	mg/kg		0.936	----	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	HD	----	----	----	----
					Client sampling date / time	21-Oct-2022 12:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203010-007	--------	--------	--------	--------
						Result	----	----	----	----
Metals										
vanadium	7440-62-2	E440	0.20	mg/kg		33.6	----	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg		79.8	----	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg		2.0	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR2-FB (Water)	----	----	----	----
					Client sampling date / time	21-Oct-2022 11:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203010-008	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
hardness (as CaCO3), from total Ca/Mg	----	EC100A	0.60	mg/L		<0.60	----	----	----	----
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L		<0.0050	----	----	----	----
chloride	16887-00-6	E235.Cl	0.50	mg/L		<0.50	----	----	----	----
fluoride	16984-48-8	E235.F	0.020	mg/L		<0.020	----	----	----	----
nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L		<0.0050	----	----	----	----
nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L		<0.0010	----	----	----	----
nitrogen, total	7727-37-9	E366	0.030	mg/L		<0.030	----	----	----	----
phosphorus, total	7723-14-0	E372-U	0.0020	mg/L		0.0053 RRV	----	----	----	----
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L		<0.30	----	----	----	----
Organic / Inorganic Carbon										
carbon, total [TC]	----	EC354	0.50	mg/L		<0.71	----	----	----	----
carbon, total inorganic [TIC]	----	E354-L	0.50	mg/L		<0.50	----	----	----	----
carbon, total organic [TOC]	----	E355-L	0.50	mg/L		<0.50	----	----	----	----
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L		0.0548 RRV	----	----	----	----
antimony, total	7440-36-0	E420	0.00010	mg/L		<0.00010	----	----	----	----
arsenic, total	7440-38-2	E420	0.00010	mg/L		<0.00010	----	----	----	----
barium, total	7440-39-3	E420	0.00010	mg/L		0.00174 RRV	----	----	----	----
beryllium, total	7440-41-7	E420	0.000100	mg/L		<0.000100	----	----	----	----
bismuth, total	7440-69-9	E420	0.000050	mg/L		<0.000050	----	----	----	----
boron, total	7440-42-8	E420	0.010	mg/L		<0.010	----	----	----	----
cadmium, total	7440-43-9	E420	0.0000050	mg/L		0.0000072 RRV	----	----	----	----
calcium, total	7440-70-2	E420	0.050	mg/L		0.132 RRV	----	----	----	----
cesium, total	7440-46-2	E420	0.000010	mg/L		<0.000010	----	----	----	----
chromium, total	7440-47-3	E420	0.00050	mg/L		0.00144 RRV	----	----	----	----
cobalt, total	7440-48-4	E420	0.00010	mg/L		<0.00010	----	----	----	----
copper, total	7440-50-8	E420	0.00050	mg/L		<0.00050	----	----	----	----
iron, total	7439-89-6	E420	0.010	mg/L		0.080 RRV	----	----	----	----
lead, total	7439-92-1	E420	0.000050	mg/L		<0.000050	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	PR2-FB (Water)	----	----	----	----
					Client sampling date / time	21-Oct-2022 11:30	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203010-008	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
lithium, total	7439-93-2	E420	0.0010	mg/L		<0.0010	----	----	----	----
magnesium, total	7439-95-4	E420	0.0050	mg/L		0.0374 RRV	----	----	----	----
manganese, total	7439-96-5	E420	0.00010	mg/L		0.00185 RRV	----	----	----	----
mercury, total	7439-97-6	E508	0.0000050	mg/L		<0.0000050	----	----	----	----
molybdenum, total	7439-98-7	E420	0.000050	mg/L		0.000167 RRV	----	----	----	----
nickel, total	7440-02-0	E420	0.00050	mg/L		0.00102 RRV	----	----	----	----
phosphorus, total	7723-14-0	E420	0.050	mg/L		<0.050	----	----	----	----
potassium, total	7440-09-7	E420	0.050	mg/L		<0.050	----	----	----	----
rubidium, total	7440-17-7	E420	0.00020	mg/L		<0.00020	----	----	----	----
selenium, total	7782-49-2	E420	0.000050	mg/L		<0.000050	----	----	----	----
silicon, total	7440-21-3	E420	0.10	mg/L		0.13 RRV	----	----	----	----
silver, total	7440-22-4	E420	0.000010	mg/L		<0.000010	----	----	----	----
sodium, total	7440-23-5	E420	0.050	mg/L		<0.050	----	----	----	----
strontium, total	7440-24-6	E420	0.00020	mg/L		0.00035 RRV	----	----	----	----
sulfur, total	7704-34-9	E420	0.50	mg/L		<0.50	----	----	----	----
tellurium, total	13494-80-9	E420	0.00020	mg/L		<0.00020	----	----	----	----
thallium, total	7440-28-0	E420	0.000010	mg/L		<0.000010	----	----	----	----
thorium, total	7440-29-1	E420	0.00010	mg/L		<0.00010	----	----	----	----
tin, total	7440-31-5	E420	0.00010	mg/L		0.00022 RRV	----	----	----	----
titanium, total	7440-32-6	E420	0.00030	mg/L		<0.00150 DLM, RRV	----	----	----	----
tungsten, total	7440-33-7	E420	0.00010	mg/L		<0.00010	----	----	----	----
uranium, total	7440-61-1	E420	0.000010	mg/L		<0.000010	----	----	----	----
vanadium, total	7440-62-2	E420	0.00050	mg/L		<0.00050	----	----	----	----
zinc, total	7440-66-6	E420	0.0030	mg/L		<0.0030	----	----	----	----
zirconium, total	7440-67-7	E420	0.00020	mg/L		<0.00020	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2203010**	Page	: 1 of 20
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Issue Date	: 07-Nov-2022 13:17
C-O-C number	: 2022-OCT-SEDMON8/9-Day 2		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 8		
No. of samples analysed	: 7		

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: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag HD	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PC1-A	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PC1-B	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PR1-A	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PR1-B	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PR2	E366	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap HD	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
PC1-A	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
PC1-B	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
PR1-A	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
PR1-B	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
PR2	E510	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
HD	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PC1-A	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PC1-B	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PR1-A	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PR1-B	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
PR2	E440	21-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	8 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
HD	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PC1-A	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PC1-B	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PR1-A	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PR1-B	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag										
PR2	E351	21-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag										
HD	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PC1-A	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PC1-B	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PR1-A	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PR1-B	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PR2	E354	21-Oct-2022	----	----	----		29-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag HD	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PC1-A	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PC1-B	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PR1-A	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PR1-B	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PR2	E185A	21-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap HD	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PC1-A	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PC1-B	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PR1-A	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PR1-B	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PR2	E108	21-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	7 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag HD	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PC1-A	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PC1-B	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PR1-A	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PR1-B	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PR2	E312A	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag HD	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	× EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PC1-A	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	× EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PC1-B	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	× EHT

Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PR1-A	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	✖ EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PR1-B	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	✖ EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PR2	E269.N+N	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	7 days	✖ EHT
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag HD	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PC1-A	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PC1-B	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PR1-A	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PR1-B	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PR2	E269.NO2	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag HD	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PC1-A	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PC1-B	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PR1-A	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PR1-B	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PR2	E384	21-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (lab preserved) PR2-FB (Water)	E298	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	31-Oct-2022	28 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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 : Chloride in Water by IC										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E235.Cl	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	21 days	0 days	✓
Anions and Nutrients : Fluoride in Water by IC										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E235.F	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	21 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E235.NO3-L	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	28-Oct-2022	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E235.NO2-L	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	28-Oct-2022	-4 days	0 days	× EHT
Anions and Nutrients : Sulfate in Water by IC										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E235.SO4	21-Oct-2022	28-Oct-2022	28 days	7 days	✓	28-Oct-2022	21 days	0 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (lab preserved) PR2-FB (Water)	E366	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	31-Oct-2022	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (lab preserved) PR2-FB (Water)	E372-U	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	29-Oct-2022	28 days	1 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Combustion (Low Level)										
Glass soil jar/Teflon lined cap PR2-FB (Water)	E354-L	21-Oct-2022	----	----	----		29-Oct-2022	14 days	8 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (lab preserved) PR2-FB (Water)	E355-L	21-Oct-2022	28-Oct-2022	3 days	7 days	× EHT	28-Oct-2022	28 days	0 days	✓

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
HDPE - total (lab preserved) PR2-FB (Water)	E508	21-Oct-2022	29-Oct-2022	0.06 hrs	5 hrs	✖ EHTR-FM	29-Oct-2022	-182.01 hrs	0.06 hrs	✖ EHTR-FM
Total Metals : Total metals in Water by CRC ICPMS										
HDPE - total (lab preserved) PR2-FB (Water)	E420	21-Oct-2022	30-Oct-2022	----	----		30-Oct-2022	180 days	9 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	2	19	10.5	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	2	15	13.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	2	13	15.3	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	2	15	13.3	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	2	18	11.1	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	2	18	11.1	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	2	16	12.5	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	2	19	10.5	10.0	✓
Total Nitrogen by Combustion	E366	721798	2	16	12.5	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							

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) - Continued							
Ammonia by Fluorescence	E298	720075	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	720041	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	720039	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	720043	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	720042	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	720040	1	20	5.0	5.0	✓
Total Inorganic Carbon by Combustion (Low Level)	E354-L	721354	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	720976	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	721804	1	12	8.3	5.0	✓
Total Nitrogen by Colourimetry	E366	720073	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	720072	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720074	1	11	9.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	720075	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	720041	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	720039	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	720043	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	720042	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	720040	1	20	5.0	5.0	✓
Total Inorganic Carbon by Combustion (Low Level)	E354-L	721354	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	720976	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	721804	1	12	8.3	5.0	✓
Total Nitrogen by Colourimetry	E366	720073	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	720072	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720074	1	11	9.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	720075	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	720041	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	720039	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	720043	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	720042	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	720040	1	20	5.0	5.0	✓
Total Inorganic Carbon by Combustion (Low Level)	E354-L	721354	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	720976	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	721804	1	12	8.3	5.0	✓
Total Nitrogen by Colourimetry	E366	720073	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	720072	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720074	1	11	9.0	5.0	✓
Matrix Spikes (MS)							

Matrix: **Water**

Evaluation: ✗ = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Ammonia by Fluorescence	E298	720075	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	720041	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	720039	1	20	5.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	720043	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	720042	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	720040	1	20	5.0	5.0	✓
Total Inorganic Carbon by Combustion (Low Level)	E354-L	721354	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	720976	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	721804	1	12	8.3	5.0	✓
Total Nitrogen by Colourimetry	E366	720073	0	1	0.0	5.0	✗
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	720072	1	14	7.1	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	720074	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
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrite is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).
Chloride in Water by IC	E235.Cl Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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 Vancouver - Environmental	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
Sulfate in Water by IC	E235.SO4 Vancouver - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Vancouver - Environmental	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Inorganic Carbon by Combustion (Low Level)	E354-L Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Inorganic Carbon is determined by the high temperature combustion method with measurement by an infrared detector, where the sample is acidified in a reaction chamber to convert all inorganic carbons (carbonates) to carbon dioxide for analysis.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L Vancouver - Environmental	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).
Total Nitrogen by Colourimetry	E366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Total Nitrogen is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Vancouver - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Vancouver - Environmental	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.
Total Mercury in Water by CVAAS	E508 Vancouver - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Hardness (Calculated) from Total Ca/Mg	EC100A Vancouver - Environmental	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
Total Carbon by Calculation	EC354 Vancouver - Environmental	Water	APHA 5310 B (mod)	Total Carbon is sum of Total Inorganic Carbon by Combustion and Total Organic Carbon by Combustion

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.
Preparation for Ammonia	EP298 Vancouver - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 Vancouver - Environmental	Water		Preparation for Total Organic Carbon by Combustion
Digestion for Total Nitrogen in water	EP366 Vancouver - Environmental	Water	APHA 4500-P J (mod)	Samples are heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2203010**	Page	: 1 of 19
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 2	Issue Date	: 07-Nov-2022 13:18
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 8		
No. of samples analysed	: 7		

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
- Reference Material (RM) 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*
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Colby Bingham	Quality Systems Coordinator	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kinny Wu	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Vancouver Inorganics, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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: **Soil/Solid**

					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: 716772)											
FJ2202995-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.20	8.25	0.6%	5%	----
Anions and Nutrients (QC Lot: 721798)											
FJ2203010-005	PR2	nitrogen, total	7727-37-9	E366	0.020	%	0.089	0.085	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 721422)											
CG2214915-003	Anonymous	carbon, inorganic [IC]	----	E354	0.050	%	2.08	2.16	3.60%	20%	----
Organic / Inorganic Carbon (QC Lot: 721797)											
FJ2203010-005	PR2	carbon, total [TC]	----	E351	0.050	%	2.75	2.82	2.65%	20%	----
Plant Available Nutrients (QC Lot: 718419)											
FJ2203010-003	PR1-A	ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	8.8	9.0	0.1	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718694)											
FJ2203010-003	PR1-A	nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718695)											
FJ2203010-003	PR1-A	nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 719784)											
KS2204037-001	Anonymous	phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	6.2	6.9	0.7	Diff <2x LOR	----
Metals (QC Lot: 716768)											
FJ2202995-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 716769)											
FJ2202995-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	5060	4240	17.4%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.59	0.52	0.07	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	6.36	6.16	3.32%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	420	381	9.54%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.34	0.34	0.0010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	5.7	<5.0	0.7	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.419	0.397	5.55%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	18700	17300	7.85%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	12.3	9.86	21.9%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	5.35	5.04	5.90%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	10.4	9.66	7.34%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 716769) - continued											
FJ2202995-001	Anonymous	iron	7439-89-6	E440	50	mg/kg	15300	14000	9.21%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	7.19	6.33	12.7%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	7.9	6.8	1.1	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	5180	4940	4.75%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	190	176	8.00%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.18	1.09	8.01%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	17.7	16.5	6.73%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	693	705	1.68%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	980	800	20.1%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.48	0.40	0.08	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.12	0.10	0.02	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	67	60	7	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	54.5	48.4	11.8%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.118	0.099	0.019	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	38.1	28.6	28.4%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.795	0.720	9.92%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	25.5	21.4	17.4%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	63.0	57.2	9.74%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.0	1.7	0.2	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*
Anions and Nutrients (QC Lot: 720039)											
WR2201363-015	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.067	0.067	0.0002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720040)											
WR2201363-015	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.78	1.79	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720041)											
WR2201363-015	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720042)											
WR2201363-015	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720043)											

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*
Anions and Nutrients (QC Lot: 720043) - continued											
WR2201363-015	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720073)											
FJ2203010-008	PR2-FB (Water)	nitrogen, total	7727-37-9	E366	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720074)											
FJ2203010-008	PR2-FB (Water)	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0053	0.0046	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 720075)											
FJ2203010-008	PR2-FB (Water)	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 720072)											
FJ2203010-008	PR2-FB (Water)	carbon, total organic [TOC]	----	E355-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 721354)											
FJ2203010-008	PR2-FB (Water)	carbon, total inorganic [TIC]	----	E354-L	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Total Metals (QC Lot: 720976)											
FC2202531-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 721804)											
YL2201905-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0367	0.0364	0.950%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00082	0.00079	0.00003	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.0244	0.0249	1.74%	20%	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.203	0.201	0.655%	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	0.250	0.264	5.41%	20%	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000092	0.0000089	0.0000003	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	86.4	88.9	2.86%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00599	0.00606	1.17%	20%	----
		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	0.278	0.291	4.73%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000573	0.000575	0.265%	20%	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0350	0.0368	4.83%	20%	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	38.8	39.7	2.44%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.233	0.237	1.78%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000275	0.000265	0.000010	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00083	0.00085	0.00002	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: 721804) - continued											
YL2201905-001	Anonymous	phosphorus, total	7723-14-0	E420	0.050	mg/L	0.067	0.083	0.016	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	11.0	11.4	2.87%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00239	0.00230	3.67%	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	4.59	4.64	1.15%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	92.4	95.0	2.82%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	1.50	1.47	2.51%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	85.8	87.7	2.16%	20%	----
		tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00120	0.00114	0.00005	Diff <2x LOR	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00163	0.00166	1.80%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.00459	0.00459	0.0968%	20%	----
		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	0.0033	0.0034	0.0001	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00030	mg/L	<0.00030	<0.00030	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: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 721798)						
nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 721422)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 721797)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 718419)						
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 718694)						
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 718695)						
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 719784)						
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 716768)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 716769)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 716769) - continued						
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 720039)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 720040)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 720041)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 720042)						
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 720043)						
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 720073)						
nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 720074)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 720075)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 720072)						
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 721354)						
carbon, total inorganic [TIC]	----	E354-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 720976)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 721804)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 721804) - continued						
strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----

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: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 716772)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.3	95.0	105	----
Anions and Nutrients (QCLot: 721798)									
nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721422)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	94.3	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721797)									
carbon, total [TC]	----	E351	0.05	%	48 %	101	90.0	110	----
Plant Available Nutrients (QCLot: 718419)									
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	100	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	102	70.0	130	----
Plant Available Nutrients (QCLot: 718695)									
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	99.2	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	92.7	80.0	120	----
Metals (QCLot: 716768)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 716769)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	91.5	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	94.7	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	89.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	107	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	87.6	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	91.0	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	89.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	89.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	88.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	87.3	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	82.5	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.8	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	97.2	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	90.3	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	86.3	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	93.1	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	86.8	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	91.0	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	91.6	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	93.9	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	85.6	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	96.1	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	91.4	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	106	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	89.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	85.7	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	89.4	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	97.7	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	90.6	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	86.8	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	103	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 720039)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 720040)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 720041)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 720042)									
nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 720043)									
nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 720073)									
nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 720074)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	90.8	80.0	120	----
Anions and Nutrients (QCLot: 720075)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	85.9	85.0	115	----
Organic / Inorganic Carbon (QCLot: 720072)									
carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721354)									
carbon, total inorganic [TIC]	----	E354-L	0.5	mg/L	8 mg/L	105	80.0	120	----
Total Metals (QCLot: 720976)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	92.8	80.0	120	----
Total Metals (QCLot: 721804)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	102	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	104	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	98.7	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	106	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	107	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	102	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.3	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 721804) - continued									
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	110	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	109	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	110	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	92.8	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	102	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	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	96.1	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.2	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	96.9	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	94.1	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	102	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	101	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.2	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: 720039)										
WR2201363-016	Anonymous	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 720040)										
WR2201363-016	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 720041)										
WR2201363-016	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 720042)										
WR2201363-016	Anonymous	nitrite (as N)	14797-65-0	E235.NO2-L	0.507 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 720043)										
WR2201363-016	Anonymous	nitrate (as N)	14797-55-8	E235.NO3-L	2.61 mg/L	2.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 720074)										
WR2201363-021	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0485 mg/L	0.05 mg/L	97.1	70.0	130	----
Anions and Nutrients (QCLot: 720075)										
KS2204055-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Organic / Inorganic Carbon (QCLot: 720072)										
KS2204055-001	Anonymous	carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 721354)										
KS2204118-001	Anonymous	carbon, total inorganic [TIC]	----	E354-L	4.98 mg/L	5 mg/L	99.7	70.0	130	----
Total Metals (QCLot: 720976)										
FJ2203010-008	PR2-FB (Water)	mercury, total	7439-97-6	E508	0.0000985 mg/L	0.0001 mg/L	98.5	70.0	130	----
Total Metals (QCLot: 721804)										
YL2201905-002	Anonymous	aluminum, total	7429-90-5	E420	0.163 mg/L	0.2 mg/L	81.6	70.0	130	----
		antimony, total	7440-36-0	E420	0.0184 mg/L	0.02 mg/L	92.0	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0186 mg/L	0.02 mg/L	93.2	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0371 mg/L	0.04 mg/L	92.8	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00849 mg/L	0.01 mg/L	84.9	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00379 mg/L	0.004 mg/L	94.8	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: 721804) - continued										
YL2201905-002	Anonymous	calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00915 mg/L	0.01 mg/L	91.5	70.0	130	----
		chromium, total	7440-47-3	E420	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0179 mg/L	0.02 mg/L	89.7	70.0	130	----
		copper, total	7440-50-8	E420	0.0181 mg/L	0.02 mg/L	90.5	70.0	130	----
		iron, total	7439-89-6	E420	1.85 mg/L	2 mg/L	92.7	70.0	130	----
		lead, total	7439-92-1	E420	0.0175 mg/L	0.02 mg/L	87.6	70.0	130	----
		lithium, total	7439-93-2	E420	0.0838 mg/L	0.1 mg/L	83.8	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0198 mg/L	0.02 mg/L	99.2	70.0	130	----
		nickel, total	7440-02-0	E420	0.0348 mg/L	0.04 mg/L	87.1	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.99 mg/L	10 mg/L	99.9	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0183 mg/L	0.02 mg/L	91.7	70.0	130	----
		selenium, total	7782-49-2	E420	0.0382 mg/L	0.04 mg/L	95.4	70.0	130	----
		silicon, total	7440-21-3	E420	9.01 mg/L	10 mg/L	90.1	70.0	130	----
		silver, total	7440-22-4	E420	0.00374 mg/L	0.004 mg/L	93.4	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		sulfur, total	7704-34-9	E420	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
		thallium, total	7440-28-0	E420	0.00345 mg/L	0.004 mg/L	86.4	70.0	130	----
		thorium, total	7440-29-1	E420	0.0197 mg/L	0.02 mg/L	98.4	70.0	130	----
		tin, total	7440-31-5	E420	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		titanium, total	7440-32-6	E420	0.0373 mg/L	0.04 mg/L	93.2	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0178 mg/L	0.02 mg/L	89.2	70.0	130	----
		uranium, total	7440-61-1	E420	ND mg/L	0.004 mg/L	ND	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0958 mg/L	0.1 mg/L	95.8	70.0	130	----
		zinc, total	7440-66-6	E420	0.357 mg/L	0.4 mg/L	89.3	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0389 mg/L	0.04 mg/L	97.2	70.0	130	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 721798)									
	RM	nitrogen, total	7727-37-9	E366	0.11 %	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721422)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	106	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721797)									
	RM	carbon, total [TC]	----	E351	1.4 %	104	80.0	120	----
Plant Available Nutrients (QCLot: 718419)									
	RM	ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
	RM	nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	56.4	0	570	----
Plant Available Nutrients (QCLot: 718695)									
	RM	nitrate + nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	91.7	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
	RM	phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	102	80.0	120	----
Metals (QCLot: 716768)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	107	70.0	130	----
Metals (QCLot: 716769)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	89.9	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	93.8	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	89.9	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	96.7	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	106	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	87.1	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	93.4	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	97.9	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	88.5	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	88.5	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	88.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	99.9	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	89.2	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	89.5	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	88.0	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	85.8	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	99.3	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	91.1	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	97.4	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	91.3	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	90.4	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	99.9	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	95.8	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	85.0	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	95.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

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Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Date and Time Required for all E&P TATs: dd-mm-yy hh:mm or hh:mm

For all tests with rush TATs requested, please contact your AM to confirm availability.

ALS Lab Work Order # (ALS use only):

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample I (This de	ordinates he report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PC1-A		21-Oct-22	~~15:25~~	Sediment	5	R	R			
	PC1-B		21-Oct-22	15:25	Sediment	5	R	R			
	PR1-A		21-Oct-22	9:45	Sediment	5	R	R			
	PR1-B		21-Oct-22	9:45	Sediment	5	R	R			
	PR2		21-Oct-22	11:15	Sediment	5	R	R			
	PR2-FB		21-Oct-22	11:30	Water	5	R	R			
	HD		21-Oct-22	12:30	Sediment	5	R	R			
	~~PR-2.81~~		18 Oct 22	09:30	Sediment	5	R	R			
	~~MD~~		18-Oct-22	11:30	Sediment	5	R	R			

FJAE Shipping & Receiving: Call Out / Expedite / Priority / Air / # of Coolers / # of Carboys / Ground

Fort St. John Work Order Reference FJ2203010

Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

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			
4.9							

SHIPMENT RELEASE (client use)

Released by: Date: Oct 22, 2022 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Oct 22/22 Time: 1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 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.

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 2

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

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Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

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: skennedy@ecofishresearch.com

Email 2: tkasubuchi@ecofishresearch.com

Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: accountspayable@ecofishresearch.com

Email 2:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

ALS Lab Work Order #: (ALS use only):

ALS Contact: Sean Zhang Sampler: Pat Beaupre

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample I (This de	ordinates he report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant/Av. Phos (F/ALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PC1-A		21-Oct-22	~~15:20~~ 15:25	Sediment	2 5	R	R			
	PC1-B		21-Oct-22	15:25	Sediment	2 5	R	R			
	PR1-A		21-Oct-22	9:45	Sediment	2 5	R	R			
	PR1-B		21-Oct-22	9:45	Sediment	2 5	R	R			
	PR2		21-Oct-22	11:15	Sediment	2 5	R	R			
	PR2-FB		21-Oct-22	11:30	Water	2 5	R	R			
	HD		21-Oct-22	12:30	Sediment	2 5	R	R			
	~~PR-2 81~~		18 Oct 22	09:30	Sediment	2 5	R	R			
	~~MD~~		18 Oct 22	11:30	Sediment	2 5	R	R			

FJAE Shipping & Receiving
Call Out Expedite Priority Air
# of Coolers 1 # of Carboys Ground

Fort St. John
Work Order Reference
FJ2203010

Telephone +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kgansborn@ecofishresearch.com

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			
4.9				9°C Lavg 5			

SHIPMENT RELEASE (client use)

Released by: Date: Oct 21, 2022 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: Oct 22/22 Time: 1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: M.K Date: 10/24/22 Time: 11:15

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.

AM

ALS Canada Ltd.

right solutions. right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2203011**	Page	: 1 of 5
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Quality Systems Coordinator	Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Metals, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	No Unit
%	percent
mg/kg	milligrams per kilogram
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Sediment**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: Pine	PD1	----	----	----
					Client sampling date / time: 22-Oct-2022 10:30	22-Oct-2022 09:35	----	----	----
					FJ2203011-001	FJ2203011-002	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
pH (1:2 soil:water)	----	E108	0.10	pH units	8.16	7.93	----	----	----
Particle Size									
grain size curve	----	E185A	-	-	See Attached	See Attached	----	----	----
clay (<0.004mm)	----	EC184A	1.0	%	9.6	7.0	----	----	----
silt (0.063mm - 0.0312mm)	----	EC184A	1.0	%	28.8	24.5	----	----	----
silt (0.0312mm - 0.004mm)	----	EC184A	1.0	%	30.5	24.2	----	----	----
sand (0.125mm - 0.063mm)	----	EC184A	1.0	%	27.7	25.9	----	----	----
sand (0.25mm - 0.125mm)	----	EC184A	1.0	%	3.3	17.2	----	----	----
sand (0.5mm - 0.25mm)	----	EC184A	1.0	%	<1.0	1.1	----	----	----
sand (1.0mm - 0.50mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
sand (2.0mm - 1.0mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
gravel (>2mm)	----	EC184A	1.0	%	<1.0	<1.0	----	----	----
Anions and Nutrients									
nitrogen, total	7727-37-9	E366	0.020	%	0.084	0.112	----	----	----
Organic / Inorganic Carbon									
carbon, total [TC]	----	E351	0.050	%	1.96	2.51	----	----	----
carbon, inorganic [IC]	----	E354	0.050	%	0.622	0.800	----	----	----
carbon, inorganic [IC], (as CaCO3 equivalent)	----	E354	0.40	%	5.19	6.67	----	----	----
carbon, total organic [TOC]	----	EC356	0.050	%	1.34	1.71	----	----	----
organic matter	----	EC356	0.10	%	2.31	2.95	----	----	----
Plant Available Nutrients									
ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	2.7	11.8	----	----	----
nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	----	----	----
phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	<2.0	<2.0	----	----	----
nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	----	----	----
nitrate, available (as N)	14797-55-8	EC269.NO3	2.0	mg/kg	<2.0	<2.0	----	----	----
Metals									
aluminum	7429-90-5	E440	50	mg/kg	4940	5440	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	Pine	PD1	----	----	----
					Client sampling date / time	22-Oct-2022 10:30	22-Oct-2022 09:35	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203011-001	FJ2203011-002	--------	--------	--------
						Result	Result	----	----	----
Metals										
antimony	7440-36-0	E440	0.10	mg/kg		0.50	0.60	----	----	----
arsenic	7440-38-2	E440	0.10	mg/kg		5.92	6.48	----	----	----
barium	7440-39-3	E440	0.50	mg/kg		366	461	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg		0.36	0.39	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg		<0.20	<0.20	----	----	----
boron	7440-42-8	E440	5.0	mg/kg		<5.0	5.1	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg		0.475	0.683	----	----	----
calcium	7440-70-2	E440	50	mg/kg		18200	23200	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg		10.7	12.5	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg		5.16	6.10	----	----	----
copper	7440-50-8	E440	0.50	mg/kg		11.1	16.1	----	----	----
iron	7439-89-6	E440	50	mg/kg		15000	14800	----	----	----
lead	7439-92-1	E440	0.50	mg/kg		7.10	7.91	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg		8.5	9.4	----	----	----
magnesium	7439-95-4	E440	20	mg/kg		5230	7170	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg		177	207	----	----	----
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	0.0507	----	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg		0.97	1.33	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg		17.7	20.7	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg		660	780	----	----	----
potassium	7440-09-7	E440	100	mg/kg		960	960	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg		0.46	0.68	----	----	----
silver	7440-22-4	E440	0.10	mg/kg		0.14	0.19	----	----	----
sodium	7440-23-5	E440	50	mg/kg		63	70	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg		47.2	63.0	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg		<1000	<1000	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg		0.125	0.154	----	----	----
tin	7440-31-5	E440	2.0	mg/kg		<2.0	<2.0	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg		15.3	17.2	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg		<0.50	<0.50	----	----	----

Analytical Results

Sub-Matrix: Sediment (Matrix: Soil/Solid)					Client sample ID	Pine	PD1	----	----	----
					Client sampling date / time	22-Oct-2022 10:30	22-Oct-2022 09:35	----	----	----
Analyte	CAS Number	Method	LOR	Unit		FJ2203011-001	FJ2203011-002	--------	--------	--------
						Result	Result	----	----	----
Metals										
uranium	7440-61-1	E440	0.050	mg/kg		0.716	0.924	----	----	----
vanadium	7440-62-2	E440	0.20	mg/kg		23.4	26.3	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg		64.4	71.5	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg		1.2	2.0	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2203011**	Page	: 1 of 9
Client	: **Ecofish Research Ltd**	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Issue Date	: 01-Nov-2022 12:11
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3		
Sampler	: PB		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No 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: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag PD1	E366	22-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	7 days	✓
Anions and Nutrients : Total Nitrogen by Combustion										
LDPE bag Pine	E366	22-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap PD1	E510	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	6 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap Pine	E510	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	28 days	6 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap PD1	E440	22-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap Pine	E440	22-Oct-2022	28-Oct-2022	----	----		29-Oct-2022	180 days	7 days	✓
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag PD1	E351	22-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Carbon by Combustion										
LDPE bag Pine	E351	22-Oct-2022	29-Oct-2022	----	----		29-Oct-2022	180 days	0 days	✓
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag PD1	E354	22-Oct-2022	----	----	----		29-Oct-2022	----	----	
Organic / Inorganic Carbon : Total Inorganic Carbon by Acetic Acid pH Standard Curve										
LDPE bag Pine	E354	22-Oct-2022	----	----	----		29-Oct-2022	----	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag PD1	E185A	22-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method										
LDPE bag Pine	E185A	22-Oct-2022	----	----	----		01-Nov-2022	365 days	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap PD1	E108	22-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap Pine	E108	22-Oct-2022	27-Oct-2022	----	----		28-Oct-2022	30 days	6 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag PD1	E312A	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓
Plant Available Nutrients : Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)										
LDPE bag Pine	E312A	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	60 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / 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
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag PD1	E269.N+N	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	6 days	× EHT
Plant Available Nutrients : Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride										
LDPE bag Pine	E269.N+N	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	3 days	6 days	× EHT
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag PD1	E269.NO2	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)										
LDPE bag Pine	E269.NO2	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	1 days	0 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag PD1	E384	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	6 days	✓
Plant Available Nutrients : Available Phosphorus by FIALab (Modified Kelowna)										
LDPE bag Pine	E384	22-Oct-2022	28-Oct-2022	----	----		28-Oct-2022	180 days	6 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

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)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	2	19	10.5	10.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	2	15	13.3	10.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	2	13	15.3	10.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	2	15	13.3	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	2	18	11.1	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	2	18	11.1	10.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	716772	1	19	5.2	5.0	✓
Total Carbon by Combustion	E351	721797	2	16	12.5	10.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	2	19	10.5	10.0	✓
Total Nitrogen by Combustion	E366	721798	2	16	12.5	10.0	✓
Method Blanks (MB)							
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A	718419	1	19	5.2	5.0	✓
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N	718695	1	15	6.6	5.0	✓
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2	718694	1	13	7.6	5.0	✓
Available Phosphorus by FIALab (Modified Kelowna)	E384	719784	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	716768	1	18	5.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	716769	1	18	5.5	5.0	✓
Total Carbon by Combustion	E351	721797	1	16	6.2	5.0	✓
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354	721422	1	19	5.2	5.0	✓
Total Nitrogen by Combustion	E366	721798	1	16	6.2	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Available Nitrate and Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.N+N Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrate and nitrite are analyzed by colourimetry using a flow injection analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Nitrite by Colourimetry (0.01M Calcium Chloride Ext.)	E269.NO2 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Plant available nitrite is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Available Ammonium by Colourimetry (2N Potassium Chloride Ext.)	E312A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2/Comm Soil Sci 19(6) (mod)	Plant available ammonium is analyzed by colourimetry using a segmented flow analyzer on a soil sample extract that has been extracted using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Total Carbon by Combustion	E351 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2 (mod)	Total Carbon is determined by the high temperature combustion method with measurement by an infrared detector.
Total Inorganic Carbon by Acetic Acid pH Standard Curve	E354 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 20.2	Total Inorganic Carbon is determined by acetic acid pH standard curve, where a known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.
Total Nitrogen by Combustion	E366 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 22.4	The sample is ignited in a combustion analyzer where nitrogen in the reduced nitrous oxide gas is determined using a thermal conductivity detector.
Available Phosphorus by FIALab (Modified Kelowna)	E384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus is extracted from air dried soil using a fixed ratio Modified Kelowna extraction. Phosphorus is determined by colorimetry using an flow injection analyzer.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Particle Size Analysis (Pipette) - Wentworth Classification	EC184A Saskatoon - Environmental	Soil/Solid	Modified Wentworth	The particle size determination is performed by various methods to generate a Grain Size curve. The data from the curve is then used to produce particle size ranges based on the Modified Wentworth Classification system.
Available Nitrate by Difference (0.01M Calcium Chloride Ext.)	EC269.NO3 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture/APHA 4500-NO3 I (mod)	Available Nitrate is determined by difference between Nitrate+Nitrite-N and Nitrite-N. A soil sample extract that has been extracted using 0.01M Calcium Chloride, then shaken well and filtered prior to analysis.
Total Organic Carbon (Calculated) in soil	EC356 Saskatoon - Environmental	Soil/Solid	CSSS (2008) 21.2	Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon (TIC).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Fixed ratio 0.01M Calcium Chloride extraction for plant available nutrients	EP269 Saskatoon - Environmental	Soil/Solid	Alberta Agriculture	Plant available nutrients (N&S) extracted using 0.01M calcium chloride, then shaken well and filtered prior to analysis.
2N Potassium Chloride extraction for available nutrients	EP269A Saskatoon - Environmental	Soil/Solid	CSSS (2008) 6.2	A soil sample extract is generated by fixed ratio extraction using 2N Potassium Chloride, then shaken well and filtered prior to analysis.
Modified Kelowna Extraction for soil	EP384 Saskatoon - Environmental	Soil/Solid	Comm. Soil Sci. Plant Anal, 25 (5&6)	Plant available phosphorus and potassium are extracted from the soil using fixed ratio Modified Kelowna solution.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
Dry and Grind in Soil/Solid <60°C	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **FJ2203011**	Page	: 1 of 10
Client	: Ecofish Research Ltd	Laboratory	: Fort St. John - Environmental
Contact	: Sarah Kennedy	Account Manager	: Sean Zhang
Address	: 1220 - 1175 Douglas Street Victoria BC Canada V8W 2E1	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	:	Telephone	: +1 250 261 5517
Project	: Sediment for MON8/9	Date Samples Received	: 22-Oct-2022 13:00
PO	: 1200-25.03.04	Date Analysis Commenced	: 27-Oct-2022
C-O-C number	: 2022-OCT-SEDMON8/9-Day 3	Issue Date	: 01-Nov-2022 12:11
Sampler	: PB ----		
Site	:		
Quote number	: VA22-ECOF100-004		
No. of samples received	: 2		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) 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*
Colby Bingham	Quality Systems Coordinator	Saskatoon Inorganics, Saskatoon, Saskatchewan
Colby Bingham	Quality Systems Coordinator	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					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: 716772)											
FJ2202995-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.20	8.25	0.6%	5%	----
Anions and Nutrients (QC Lot: 721798)											
FJ2203010-005	Anonymous	nitrogen, total	7727-37-9	E366	0.020	%	0.089	0.085	0.004	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 721422)											
CG2214915-003	Anonymous	carbon, inorganic [IC]	----	E354	0.050	%	2.08	2.16	3.60%	20%	----
Organic / Inorganic Carbon (QC Lot: 721797)											
FJ2203010-005	Anonymous	carbon, total [TC]	----	E351	0.050	%	2.75	2.82	2.65%	20%	----
Plant Available Nutrients (QC Lot: 718419)											
FJ2203010-003	Anonymous	ammonium, available (as N)	14798-03-9	E312A	1.0	mg/kg	8.8	9.0	0.1	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718694)											
FJ2203010-003	Anonymous	nitrite, available (as N)	14797-65-0	E269.NO2	0.40	mg/kg	<0.40	<0.40	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 718695)											
FJ2203010-003	Anonymous	nitrate + nitrite, available (as N)	----	E269.N+N	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Plant Available Nutrients (QC Lot: 719784)											
KS2204037-001	Anonymous	phosphate, available (as P)	14265-44-2	E384	2.0	mg/kg	6.2	6.9	0.7	Diff <2x LOR	----
Metals (QC Lot: 716768)											
FJ2202995-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 716769)											
FJ2202995-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	5060	4240	17.4%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.59	0.52	0.07	Diff <2x LOR	----
		arsenic	7440-38-2	E440	0.10	mg/kg	6.36	6.16	3.32%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	420	381	9.54%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.34	0.34	0.0010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	5.7	<5.0	0.7	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.419	0.397	5.55%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	18700	17300	7.85%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	12.3	9.86	21.9%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	5.35	5.04	5.90%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	10.4	9.66	7.34%	30%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 716769) - continued											
FJ2202995-001	Anonymous	iron	7439-89-6	E440	50	mg/kg	15300	14000	9.21%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	7.19	6.33	12.7%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	7.9	6.8	1.1	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	5180	4940	4.75%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	190	176	8.00%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.18	1.09	8.01%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	17.7	16.5	6.73%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	693	705	1.68%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	980	800	20.1%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.48	0.40	0.08	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.12	0.10	0.02	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	67	60	7	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	54.5	48.4	11.8%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.118	0.099	0.019	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	38.1	28.6	28.4%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.795	0.720	9.92%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	25.5	21.4	17.4%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	63.0	57.2	9.74%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.0	1.7	0.2	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: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 721798)						
nitrogen, total	7727-37-9	E366	0.02	%	<0.020	----
Organic / Inorganic Carbon (QCLot: 721422)						
carbon, inorganic [IC]	----	E354	0.05	%	<0.050	----
Organic / Inorganic Carbon (QCLot: 721797)						
carbon, total [TC]	----	E351	0.05	%	<0.050	----
Plant Available Nutrients (QCLot: 718419)						
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 718694)						
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	<0.40	----
Plant Available Nutrients (QCLot: 718695)						
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	<1.0	----
Plant Available Nutrients (QCLot: 719784)						
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	<2.0	----
Metals (QCLot: 716768)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 716769)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 716769) - continued						
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
zinc	7440-66-6	E440	2	mg/kg	<2.0	----
zirconium	7440-67-7	E440	1	mg/kg	<1.0	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 716772)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.3	95.0	105	----
Anions and Nutrients (QCLot: 721798)									
nitrogen, total	7727-37-9	E366	0.02	%	22.37 %	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721422)									
carbon, inorganic [IC]	----	E354	0.05	%	0.5 %	94.3	90.0	110	----
Organic / Inorganic Carbon (QCLot: 721797)									
carbon, total [TC]	----	E351	0.05	%	48 %	101	90.0	110	----
Plant Available Nutrients (QCLot: 718419)									
ammonium, available (as N)	14798-03-9	E312A	1	mg/kg	10 mg/kg	100	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
nitrite, available (as N)	14797-65-0	E269.NO2	0.4	mg/kg	20 mg/kg	102	70.0	130	----
Plant Available Nutrients (QCLot: 718695)									
nitrate + nitrite, available (as N)	----	E269.N+N	1	mg/kg	40 mg/kg	99.2	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
phosphate, available (as P)	14265-44-2	E384	2	mg/kg	12.5 mg/kg	92.7	80.0	120	----
Metals (QCLot: 716768)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 716769)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	91.5	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	94.7	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	89.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	107	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	87.6	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	91.0	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	89.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	89.3	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	88.2	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	87.3	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	82.5	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.8	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	97.2	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	90.3	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	86.3	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	93.1	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	86.8	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	91.0	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	91.6	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	93.9	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	85.6	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	96.1	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	97.9	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	91.4	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	106	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	89.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	85.7	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	89.4	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	97.7	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	90.6	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	86.8	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	103	80.0	120	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Anions and Nutrients (QCLot: 721798)									
	RM	nitrogen, total	7727-37-9	E366	0.11 %	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721422)									
	RM	carbon, inorganic [IC]	----	E354	0.383 %	106	80.0	120	----
Organic / Inorganic Carbon (QCLot: 721797)									
	RM	carbon, total [TC]	----	E351	1.4 %	104	80.0	120	----
Plant Available Nutrients (QCLot: 718419)									
	RM	ammonium, available (as N)	14798-03-9	E312A	72 mg/kg	95.5	80.0	120	----
Plant Available Nutrients (QCLot: 718694)									
	RM	nitrite, available (as N)	14797-65-0	E269.NO2	0.17 mg/kg	56.4	0	570	----
Plant Available Nutrients (QCLot: 718695)									
	RM	nitrate + nitrite, available (as N)	----	E269.N+N	18.9 mg/kg	91.7	70.0	130	----
Plant Available Nutrients (QCLot: 719784)									
	RM	phosphate, available (as P)	14265-44-2	E384	10.47 mg/kg	102	80.0	120	----
Metals (QCLot: 716768)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	107	70.0	130	----
Metals (QCLot: 716769)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	89.9	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	93.8	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	89.9	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	96.7	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	106	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	87.1	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	93.4	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	97.9	70.0	130	----
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	88.5	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	88.5	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	88.8	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 716769) - continued									
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	99.9	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	89.2	70.0	130	----
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	89.5	70.0	130	----
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	88.0	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	85.8	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	99.3	70.0	130	----
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	91.1	70.0	130	----
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	97.4	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	91.3	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	90.4	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	99.9	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	95.8	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	93.1	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	85.0	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	95.6	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 2022-OCT-SEDMON8/9-Day 3

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

ALS Lab Work Order # (ALS use only):

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	skennedy@ecofishresearch.com
Email 2	tkasubuchi@ecofishresearch.com
Email 3	waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax	accountspayable@ecofishresearch.com
Email 2	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Sean Zhang **Sampler:** Pat Beaupre

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm or ppm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Av. Ammonium, Part. size, Plant Av Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~REA~~	~~17 Oct 2022~~	~~14:15~~	Sediment	2	R	R			
	~~PD2~~			Sediment	~~2~~	R	R			
	PINE	22 Oct 2022	10:30	Sediment	~~2~~ 1	R	R			
	PD1	22 Oct 2022	9:35	Sediment	~~2~~ 1	R	R			
	~~PD4~~	~~17 OCT 22~~	~~10:45~~	Sediment	~~2~~	R	R			
	~~KR~~	~~17 Oct 22~~	~~13:40~~	Sediment	2	R	R			
	~~PD5~~	~~17 OCT 22~~	~~15:25~~	Sediment	~~2~~	R	R			
	~~PD3~~	~~21 OCT 22~~	~~14:40~~	Sediment	~~2~~	R	R			
		~~20 OCT 22~~	~~07:45~~	Sediment	~~2~~	R	R			

Fort St. John
Work Order Reference
FJ2203011

Telephone : +1 250 261 5617

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:

csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com

Note: 2 jars + 3 whirlpacks per site

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			
6.5							

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
RM	22 Oct 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Oct 22/22	1300

FINAL SHIPMENT RECEPTION (ALS use only)

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.

AUG 2020 FRONT

Chain of Custody (COC) / Analytical Request Form

COC Number: 2022-OCT-SEDMON8/9-Day 3

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Ecofish Research Ltd.
Contact:	Sarah Kennedy
Phone:	250-334-3042
	Company address below will appear on the final report
Street:	600 Comox Rd.
City/Province:	Courtenay, BC
Postal Code:	V9N 3P6
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	Ecofish Research Ltd.
Contact:	accountspayable@ecofishresearch.com

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: skennedy@ecofishresearch.com
Email 2: tkasubuchi@ecofishresearch.com
Email 3: waterqualitylabdata@ecofishresearch.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: accountspayable@ecofishresearch.com
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 minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	VA22-ECOF100-004
Job #:	Sediment for MON8/9
PO / AFE:	1200-25.03.04
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): **ALS Contact:** Sean Zhang **Sampler:** Pat Beaupre

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	Av. Ammonium, Part. size, Plant Av. Phos (FIALab), Total N (Combust)	Available Nitrate, Nitrite, CSR Metals + Hg + pH, TC, TIC, TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	~~PD2~~			~~Sediment~~	~~2~~	~~R~~	~~R~~			
	PINE	22 Oct 2022	10:30	Sediment	2	R	R			
	PD1	22 Oct 2022	9:35	Sediment	2	R	R			
	~~PD4~~			~~Sediment~~	~~2~~	~~R~~	~~R~~			
	~~PD3~~			~~Sediment~~	~~2~~	~~R~~	~~R~~			
	~~PD5~~			~~Sediment~~	~~2~~	~~R~~	~~R~~			

Fort St. John
Work Order Reference
FJ2203011
Telephone : +1 250 261 5517

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human consumption/ use? ☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please send Azimuth a copy of the data in their EDD format:
csuzanne@ecofishresearch.com kganshorn@ecofishresearch.com
Note: 2 jars + 3 whirlpacks per site

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			
6.5				9.8 C (avg 8)			

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
RM	22 Oct 2022	

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
	Oct 22/22	1300

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
M.K	10/24/22	11:15

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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.

AM