Fernie Landfill 2021 Groundwater Monitoring Annual Report



PREPARED FOR:REGIONAL DISTRICT OF EAST KOOTENAY PREPARED BY: SPERLING HANSEN ASSOCIATES

January, 2022

PRJ21063





- Landfill Engineering
- Solid Waste Planning
- Environmental Monitoring
- Landfill Fire Control

1. INTRODUCTION

Sperling Hansen Associates (SHA) was retained by the Regional District of East Kootenay (RDEK) in 2020 to develop an updated Groundwater Monitoring Program (GMP) for seven (7) Solid Waste Management facilities located withing the RDEK. As part of this GMP update SHA, along with Subconsultant Bear Environmental Limited (BEAR), will conduct four (4) groundwater sampling events per year, and provide one interim report per event for each site. The goal of this program is to provide the RDEK with valuable information regarding the groundwater quality at disposal sites and to assist in developing appropriate monitoring and management measures until 2025.

In 2021, sampling events occurred in January, April, July, and November over a week period. Samples taken from each site are recorded below, and water quality analysis discussed in Section 3. This report details the sampling notes, lab analysis results, and trends observed at the wells throughout 2021. Section 5 presents recommendations for the next year of monitoring.



Photo 1-2. Fernie Landfill Site Location



1.1 Location and Setting

The closed Fernie Landfill is located in the sub-region of Elk Valley within the RDEK. The site is approximately 1 km east of Fernie on Coal Creek Road. The longitude and latitude are 115.044380° W and 49.498779° N respectively.



Photo 1-1. Aerial View of the Closed Fernie Landfill Site.

1.2 Site Operations

The landfill opened in the year 1970 and operated until 2000. Between 2000 and 2007 the site acted as a temporary Transfer Station. Final closure commenced in 2006 and was completed in 2008. The site is approximately 13 hectares in size and serviced a population of approximately 8,000 local residents, during its service life. The OC is attached here as Appendix A.

2. MONITORING PROGRAM

Due to the nature of waste when it comes into contact with water, landfill facilities are required to monitor wells on and off site to observe impacts to groundwater and surface water. In compliance with Landfill Criteria for Municipal Solid Waste, groundwater and surface water have been historically monitored at the Fernie Landfill.

Monitoring locations and sampling frequencies were identified in the post closure monitoring plan presented in the Design, Operations and Closure Plan (DOCP) that SHA developed for the site in 2004 (SHA 2004). The well locations are identified in Figure 1.



The monitoring program is summarized as follows:

- the groundwater monitoring program consists of quarterly sampling of six (6) wells and annual sampling of an additional three (3) wells;
- the surface water monitoring program consists of a total of five (5) surface water monitoring locations to be sampled on a quarterly basis, and an additional two (2) locations to be sampled on an annual basis.

2.1 Methodology

In 2021, the groundwater and surface water wells were sampled in accordance to the BC Field Sampling Manual. Samples were delivered to ALS Environmental in Calgary by courier. Certificates of Analysis (COA) are included in Appendix C. Based on internal laboratory QA/QC, the results are considered reliable.

Table 2-1 see below list the required monitoring parameters. Locations of the monitoring wells and surface water stations are presented in Figure 1.

Groundwater **Ouarterly Parameters Yearly Parameters** alkalinity alkalinity chloride chloride fluoride fluoride sulphate sulphate ammonia ammonia nitrate nitrate Nitrite (N) Nitrite (N) TOC TOC orthophosphorous orthophosphorous **Dissolved Metals Dissolved Metals** COD COD **BOD** BOD PAH Annually from SHA-5s VOC Annually from SHA-5s

Table 2-1. Groundwater Monitoring Parameters.

2.2 Groundwater Flow

The Fernie site is a closed landfill and is located on glacial till and colluvium underlain by bedrock. The topography of the site slopes from north to southwest. The Elk River is located approximately 1.5km west of the Site. Coal Creek, a tributary to Elk River run east-west approximately 65m south of the Site. A tributary to Coal Creek appears to dissect the site from North the South. Based on regional topography,



groundwater is inferred to flow south west in the same direction as the Elk River. Locally, groundwater flow can be affected by building foundations, recharge areas, drainage and subsurface utilities. Depending on their depth, underground structures may significantly influence shallow groundwater flow in the vicinity of the Site. Well details are shown in Table 2-2 below.

Table 2-2. Well Details and Water Levels

Well ID	Well Construction	Q1 Water Level (m)	Q2 Water Level (m)	Q3 Water Level (m)	Q4 Water Level (m)
E257239	2" PVC	4.690	5.045	5.720	5.210
E257242	2" PVC	2.975	3.120	3.380	2.940
E257235	2" PVC	1.440	1.780	3.040	1.845
E257237	2" PVC	2.180	2.930	Dry	2.850
E257244	2" PVC	2.470	2.725	4.535	3.400
E257236	2" PVC	1.920	2.190		_
E257238	2" PVC	4.095	3.695	7.710	_

2.3 Surface Water

The DOCP list a total of five (5) surface water monitoring locations to be sampled on a quarterly basis, and an additional two (2) locations to be sampled on an annual basis. Some of the streams listed are of ephemeral nature with only enough water for sampling periodically.

Table 2-3 presented below list the required monitoring parameters.

Table 2-3. Surface Water Monitoring Parameters

Surface	Water
Quarterly Parameters	Yearly Parameters
alkalinity	alkalinity
chloride	chloride
fluoride	fluoride
sulphate	sulphate
ammonia	ammonia
nitrate	nitrate
Nitrite (N)	Nitrite (N)
TOC	TOC
orthophosphorous	orthophosphorous
Total Metals	Total Metals
COD	COD
BOD	BOD
TSS	TSS



The main surface water body near the site is Coal Creek, a large creek and tributary to Elk River located downgradient and south of the site across from Coal Creek Road. Locations of the surface water monitoring locations are presented in Figure 1.

Several surface water locations could not be sampled due to insufficient recharge or lack of flow. In April, E257252 was noted to be dry, and SHA-5S had insufficient recharge. In July, E257245, E257250, and E257252 were reported to be dry. E257244 and SHA-5S had insufficient recharge. In November, E257252 was dry and SHA-5S again had insufficient recharge. In April and November E257239 was reported to have slow recharge.

2.4 Nomenclature

The reporting of monitoring wells at the RDEK sites has previously been a combination of Environmental Monitoring System Numbers (EMSN) and site number names that are the more common naming convention (MW-1). The majority of sites have both, but some wells only have the E number. To avoid confusion and the potential of double counting the wells, SHA has decided to use the E numbers when referring to them. This way reports and analyses can be consistent, and can be traced to the OC or Permit for the site. The site maps attached to these Annual Reports as Figure 1 have been updated to reflect this change and now have the EMSN numbers labelled.

2.5 Regulatory Criteria

Per the DOCP completed in 2004, ground and surface water quality should be assessed using the most recent Approved and Working Criteria for Water Quality prepared by the Water Management Division of the Ministry of Environment, Lands, and Parks at or beyond the landfill property boundary.

The BC Contaminated Sites Regulation (CSR) Protocol 21 indicates that Aquatic Life Standards (AW) generally apply to all groundwater located within 500 m of a surface water body containing aquatic life. The Site is located approximately 65m from Coal Creek and 150m east of Elk River, therefore the Aquatic Life for Freshwater (AW) standards will apply.

The CSR Protocol 21 indicates that Drinking Water (DW) Standards generally apply to groundwater and surface water where drinking water sources are within 500m of a site, or if a property is situated on an aquifer that could be used in the future for Drinking Water. A search for water wells revealed that there are no water wells within 500m of the Site. Information from the BC Water Atlas indicates that there are no mapped aquifers underlying the Site. Although current DW use appears to not apply to the site, without further investigation, future DW standards are assumed to apply. Note that future drinking water use applies where information is unavailable or inadequate to demonstrate an absence of drinking water aquifers below a site.

Recent standards and guidelines have been applied by SHA to include:

• The Schedule 3.2 of the BC CSR Standards with consideration to Aquatic Life (AW) and Drinking Water (DW) 2020 for groundwater quality;



 British Columbia Approved Water Quality Guidelines: Aquatic Life (AW) and Drinking Water (DW) for surface water.

These standards and guidelines are the most recent published by BC ENV used to assess groundwater at contaminated sites and the quality of drinking water. The CSR guidelines are used to assess groundwater quality, while the BC WQG are used for surface water.

3. RESULTS

Parameters tested during this event included:

- alkalinity, chloride, fluoride, sulphate, ammonia, nitrate, nitrite, TOC, orthophosphorus, dissolved metals, BOD, COD, and TSS.
- Annual parameters benzene, toluene, ethylbenzene, and xylene (BTEX), volatile petroleum hydrocarbons, (VPH), and extractable petroleum hydrocarbons (EPH) were not tested in 2020.

In Appendix B, Table B-1 provide the water quality analysis alongside the applicable water standards.

3.1 Exceedances

Table 3-1 shows exceedances and the associated location by analyte.

E257235 E257236 E257237 E257238 E257239 E257242 E257244 E257240* E257243* E257245* E257246* E257247* E257250* E257252* Lab Results Dissolved Metals Lithium (dissolved) (CSR DW) X X X X X X Manganese (dissolved) (CSR DW) X X General and Inorganic Parameters X X Total organic carbon (BC SDWQG) X X X X X Χ Total Metals Lithium (total) (CSR DW) X Χ

Table 3-1. Exceedances Summary by Analyte

3.1.1 Groundwater

All parameters tested in groundwater were below applicable BC CSR AW Standards.

Parameters above BC CSR DW standards in groundwater included:

- Lithium (dissolved)
- Manganese



Maximum concentrations are shown in the Table below:

Table 3-2. Maximum Concentrations in Groundwater

Parameter	BC CSR DW Standard (µg/L)	Maximum Concentration (μg/L)	Well Name
Dissolved Lithium (Li)	8	15.9	E257244
Dissolved Manganese (Mn)	1,500	2,680	E257235

3.1.2 Surface Water

The BC SDWQG Maximum Allowable Concentration (MAC) for total organic carbon (TOC) was exceeded at several surface water locations. Parameters above the CSR-DW guidelines included total lithium. Maximum concentrations are shown in the Table below:

Table 3-3. Maximum Concentrations in Surface Water

Parameter	BC SDWQG MAC (mg/L)	Maximum Concentration (mg/L)	Well Name
Total organic carbon	4	11.1	E257250
Parameter	BC CSR DW Standard (µg/L)	Maximum Concentration (µg/L)	Well Name
Total Lithium (Li)	8	12.1	E257247

4. DISCUSSION

With the exception of dissolved and total lithium, dissolved manganese, and TOC, the parameters tested for in 2021 were below applicable water quality criteria.

Maximum concentrations in groundwater included the following:

- Lithium (dissolved) was found at E257244 at 15.9 μ g/L versus the BC CSR DW standard of 8 μ g/L.
- Manganese was found at E257235 at 2,680 μg/L versus the BC CSR DW standard of 1,500 μg/L.
- Lithium (total) was found at E257247 at 12.1 μg/L versus the BC CSR DW standard of 8 μg/L.

These maximums are calculated as 1.99, 1.79, and 1.51-times respective DW standards.

Note that SHA reviewed Site water use per Protocol 21 to determine suitable criteria to compare water quality. Although current drinking water use does not appear to apply to the Site, due to the lack of



information concerning the unmapped aquifer underlying the Site, future drinking water use may be applicable.

Based on this information, SHA considers the impacts from slightly elevated metals above DW standards and guidelines to be low. Note that elevated metals parameters were not accompanied by other typical elevated landfill leachate parameters such as sulphate, sodium, and nitrate.

4.1 Trend Analysis

To illustrate the trends observed in key parameters at the wells sampled, SHA has prepared figures that combine the 2020-2021 analytical results with the applicable criteria limits. These figures are attached to this report as Appendix D.

- Figure 2 Dissolved Lithium concentrations
- Figure 3 Total Lithium concentrations
- Figure 4 Sulfate concentrations
- Figure 5 Sodium concentrations
- Figure 6 Chloride concentrations
- Figure 7 Nitrate Concentrations
- Figure 8 Specific Conductance (Conductivity)
- Figure 9 Manganese concentrations

Lithium and manganese are the only parameters above the CSR DW limit; however, these are observed in some and sometimes all quarterly events and have not formed a consistently exceeding trend. Sulfate, sodium, chloride, nitrate, and conductivity are graphed because they are typical landfill indicators. As shown in the graphs, these parameters are below applicable standards and guidelines and show the landfill is not impacting groundwater chemistry beyond regulatory standards.

Please note that the graphs provided are for observing trends, and data less than or equal to the detection limit for a parameter appears on graphs as trace concentrations. If a well shows to have no data on the graph, please refer to the master data table for the exact parameter concentration.

5. CONCLUSIONS AND RECOMMENDATIONS

In 2021, sampling at the Site occurred closely in line with the Site's DOCP developed by SHA in 2004 (SHA 2004). All parameters generally associated with landfill leachate including, but not limited to, chloride, nitrate, and sulfate where below applicable standards and guidelines. However, some metals parameters, lithium and manganese in groundwater were detected slightly above applicable criteria.

In conducting analyses for seven different sites within the RDEK with similar exceedances, above the CSR DW limit, SHA believes there is evidence to support that the elevated concentrations are a region-wide occurrence caused by existing background concentrations rather than impacts caused by activities at the solid waste sites.

SHA reviewed Site and surrounding area water use, based on this information, SHA considers the impacts from slightly elevated metals above DW standards and guidelines to be low.



SHA recommends the following:

Parameter concentrations of dissolved metals slightly above applicable standards were detected in the Site groundwater monitoring wells. Based on surrounding land use, and relatively low impact to the immediate environment, SHA does not envision a change to the sampling method is warranted at this time. However, if exceeding parameters begin to form a consistently increasing trend, the RDEK may consider groundwater sampling methods using a low flow technique, where possible, to minimize the resuspension of colloidal materials that can be caused during sampling with bailers and/or Waterra inertia pumps. If this sampling method is effective in providing a more accurate interpretation of groundwater data and able to show the groundwater exceedances are a result of suspended materials from bailer sampling, then SHA could make a recommendation to the Regional District to implement this sampling method for the monitoring going forward.

The next sampling event is scheduled for January, 2022, kicking off the third year of the monitoring contract.



6. STATEMENT OF LIMITATIONS

This report has been prepared by Sperling Hansen Associates. (SHA) on behalf of the Regional District of East Kootenay (RDEK) in accordance with generally accepted engineering practices to a level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions in British Columbia.

The report is based on site visits, project experience, and analysis by SHA staff of data compiled during the preparation of this report from a number of sources. Except where specifically stated to the contrary, the information on which this study is based has been obtained from external sources. This external information has not been independently verified or otherwise examined by SHA to determine its accuracy and completeness. SHA has relied in good faith on this information and does not accept responsibility of any deficiency, misstatements or inaccuracies contained in the reports as a result of omissions, misinterpretation and/or fraudulent acts of the persons interviewed or contacted, or errors or omissions in the reviewed documentation.

The report is intended solely for the use of the RDEK. Any use which other parties makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such other parties. SHA does not accept any responsibility for other uses of the material contained herein nor for damages, if any, suffered by any third party because of decisions made or actions based on this report. Copying of this intellectual property for other purposes is not permitted.

The findings and conclusions of this report are valid only as of the date of this report. The interpretations presented in this report and the conclusions and recommendations that are drawn are based on information that was made available to SHA during the course of this project. Should additional new data become available in the future, SHA should be requested to re-evaluate the findings of this report and modify the conclusions and recommendations drawn, as required.

Should you have any questions on this report or require further assistance or information, please feel free to contact the undersigned at 778-471-7088 or 604-986-7723.

Report prepared by:

Chlor Hetherington

Chloe Hetherington

Environmental Analyst Assistant

Report reviewed by:

Scott Garthwaite

Sr. Civil Technologist

7. REFERENCES

Eco/Logic Environmental, Fernie Landfill Post-Closure Groundwater Monitoring 2019, prepared for the Regional District of East Kootenay.

Environmental Management Act, BC Contaminated Sites Regulation Schedule 3.2, 2019.

Ministry of Environment, BC Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture Summary Report, August 2019.

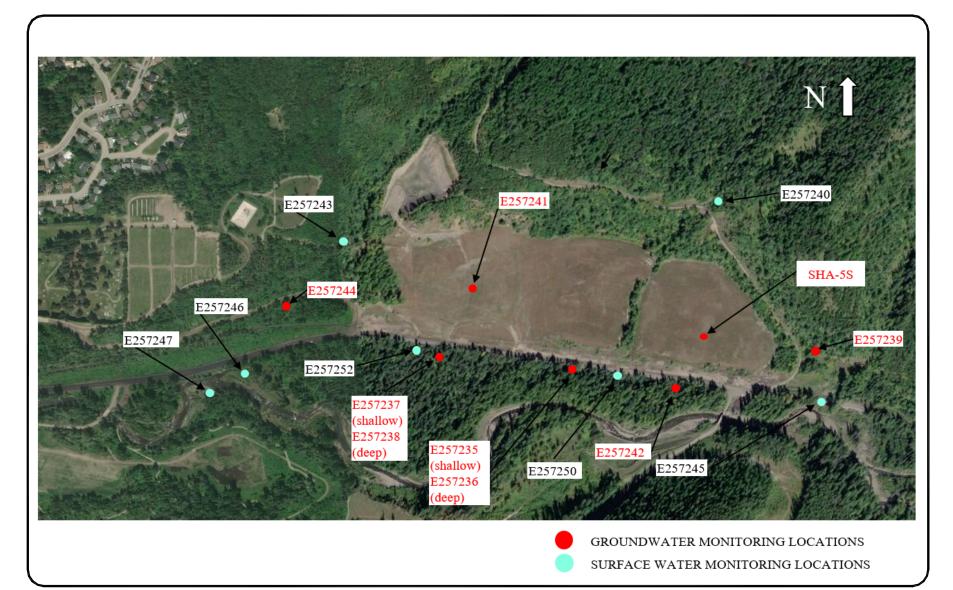
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SHA 2004. Fernie Closure Plan. Sperling Hansen Associates PRJ04007. March 2004.

British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture, Summary Report. Water Protection & Sustainability Branch, Ministry of Environment & Climate Change Strategy, August 2019.

https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf







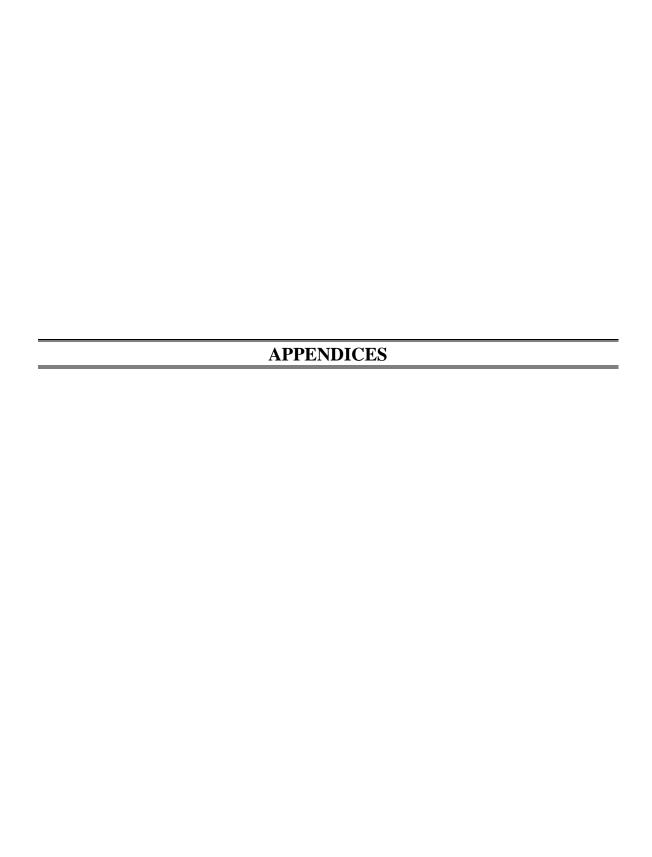


PROJECT:

SOLID WASTE FACILITY MONITORING PROGRAM 2020-2025 TITLE:

FERNIE
LANDFILL
MONITORING LOCATIONS

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	APPENDIX A
	Permit
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February 25, 2005

File: PR-01486

REGISTERED MAIL

City of Fernie PO Box 190 Fernie, British Columbia V0B 1M0

Dear Permittee:

Re: Cancellation of Permit PR-01486 under the Environmental Management Act

Please be advised that Waste Management Permit PR-01486 issued in the name of The Corporation of the City of Fernie is hereby cancelled pursuant to Section 24 (10) of the Environmental Management Act.

Yours truly,

R. W. Baker, P.Eng.

for Director, Environmental Management Act

Kootenay and Okanagan Regions

cc: Environment Canada

R.D.E.K., 19-24th Avenue South, Cranbrook BC V1C 3H8

BC Environment

#401 - 333 Victoria Street Nelson, British Columbia V1L 4K3 Telephone: (604) 354-6333 Main Fax: (604) 354-6332 ER Fax: (604) 354-6367

MINISTRY OF ENVIRONMENT, LANDS AND PARKS AND MINISTER RESPONSIBLE FOR MULTICULTURALISM AND HUMAN RIGHTS

File: PR-01486

APR 2 6 1995

REGISTERED MAIL

The Corporation of the City of Fernie Post Office Box 190 Fernie, British Columbia VOB 1M0

Dear Permittee:

NOTICE OF AN AMENDMENT TO PERMIT PR 01486
ISSUED UNDER THE PROVISIONS OF
THE WASTE MANAGEMENT ACT, S.B.C. 1982, C.41,
IN THE NAME OF THE CORPORATION OF THE CITY OF FERNIE

Take notice that the Assistant Regional Waste Manager has this day issued an amendment to Permit PR-01486. The amendment consists of an updated format of the permit and changes to Subsection 3.1 and will become effective immediately.

The amended permit is enclosed.

Dated at Nelson, British Columbia this

APR 2 6 1995

Barry Wood, P. Eng.

Assistant Regional Waste Manager

/sw

Attachment



BC Environment

#401 - 333 Victoria Street Nelson, British Columbia V1L4K3 Telephone: (604) 354-6333 Main Fax: (604) 354-6332 EP Fax: (604) 354-6367

APR 2 6 1995

File: PR-01486

REGISTERED MAIL

The Corporation of the City of Fernie Post Office Box 190 Fernie, British Columbia V0B 1M0

Dear Permittee:

Enclosed is Amended Permit PR-01486 issued under the provisions of the Waste Management Act. Your attention is respectfully directed to the conditions outlined in the permit. An annual permit fee will be determined according to the Waste Management Permit Fees Regulation.

This permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. It is also the responsibility of the permittee to ensure that all activities conducted under this permit are carried out with due regard to the right of the third parties and comply with other applicable legislation that may be in force.

This permit may be appealed by persons who consider themselves aggrieved by this decision in accordance with Part 5 of the Waste Management Act. Written notice of intent to appeal must be received by the Regional Waste Manager within twenty-one (21) days of the date of this decision.

Administration of this permit will be carried out by staff from our Sub-Regional Office located at 205 Industrial Road G, Cranbrook, British Columbia, V1C 6H3, (telephone: (604) 489-8510). Plans, data and reports pertinent to the permit are to be submitted to the Regional Waste Manager at Nelson, British Columbia.

Yours truly,

Barry Wood, P. Eng.

Assistant Regional Waste Manager

Kootenay Region

/sw

ENCLOSURE



MINISTRY OF ENVIRONMENT, LANDS AND PARKS

PERMIT PR-01486

Under the Provisions of the Waste Management Act

THE CORPORATION OF THE CITY OF FERNIE POST OFFICE BOX 190 FERNIE, BRITISH COLUMBIA V0B 1M0

is authorized to discharge refuse to the ground and contaminants to the air from municipal sources located in and near the City of Fernie, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

1. AUTHORIZED DISCHARGE

- 1.1. This subsection applies to the discharge of refuse from MUNICIPAL SOURCES located in and near the City of Fernie as shown on the attached Site Plan A. The site reference number for this discharge is E210156.
 - 1.1.1. The maximum authorized rate of discharge is 5,528 tonnes per year excluding those items listed in Subsection 2.3 of this permit.
 - 1.1.2. The characteristics of the discharge shall be typical municipal refuse, excluding special waste.
 - 1.1.3. The authorized works are those associated with a landfill operation located approximately as shown on attached Site Plan A.
 - 1.1.4. The location of the facilities from which the discharge originates is in and near the City of Fernie.
 - 1.1.5. The location of the point of discharge is Part of Parcel 89 of District Lot Number 4589, Kootenay District.

Date Issued: December 4, 1972

Date Amended:

(most recent) Page: 1 of 6

APR 2 6 1995

Barry Wood, P. Eng.

Assistant Regional Waste Manager

Environmental Protection

#401-333 Victoria Street

Nelson, British Columbia V1L 4K3 Telephone: (604) 354-6355

2. GENERAL REQUIREMENTS

2.1. Landfill Operation

From April 2 to October 31 the permittee shall ensure that all exposed refuse is covered with a minimum of 0.15 metres of cover material of a type suitable to the Regional Waste Manager at the end of each day of public access. The permittee shall not allow uncovered refuse to accumulate overnight. The Regional Waste Manager may vary the April 2 and October 31 dates to meet specific weather and wildlife conditions.

From November 1 to April 1 the permittee shall ensure that all exposed refuse is covered with a minimum of 0.15 metres of cover material of a type suitable to the Regional Waste Manager once per seven days. The Regional Waste Manager may vary the November 1 and April 1 dates to meet specific weather and wildlife conditions. Within 90 days of issuance of this permit the permittee shall advise the Regional Waste Manager in writing of the precautions the permittee will take to ensure an adequate supply of frost free cover material is available during winter operation to meet the once per seven day covering requirement.

In the event of an emergency or condition beyond the control of the permittee which prevents operation of the landfill as specified, the permittee shall immediately notify the Regional Waste Manager.

The use of refuse containers at or near the landfill is prohibited unless approved by the Regional Waste Manager.

2.2. Site Preparation and Restoration

Provision of fencing, site access control, vehicle safety barriers, surface water diversionary works, firebreaks final cover and site restoration as required, shall be approved by the Regional Waste Manager.

2.3. Segregation of Wastes

Segregate large metallic waste such as appliances and auto bodies, etc., for disposal in a separate area of the site. Used tires shall be segregated for disposal in a separate area of the site. Burning of tires by the permittee is prohibited.

Date Issued: December 4, 1972

Date Amended:

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Barry Wood, P. Eng.

Assistant Regional Waste Manager

2.4. Wildlife Nuisance

The subject discharge is one that is of concern because of the possibility of a nuisance or hazard being caused by bears or other animals attracted to the site. For this reason the permittee shall install electric fencing. On or before June 15, 1994 the permittee shall submit a report on electric fencing to the Regional Waste Manager for approval. The report shall contain the following;

- detailed plans and drawings of the proposed fence;
- specifications of fence components;
- estimated costs of installation, operation and maintenance; and,
- a fence construction schedule which shall contain a firm completion date of no later than July 29, 1994.

2.5. Annual Report

The permittee shall submit an annual report to the Regional Waste Manager for approval on or before January 31 each year. The report shall contain the following information;

- total volume and/or tonnage of waste discharged into the landfill for the previous calendar year;
- approved design volume;
- remaining site life and capacity;
- operational plan for the next 12 months;
- operation and maintenance expenditures;
- any leachate, water quality and landfill gas monitoring data and interpretation;
- where applicable, amounts of leachate collected, treated and disposed;
- any changes from approved reports, plans and specifications;
- an up to date contingency plan, noting any amendments made to the plan during the year;
- where applicable, amount of landfill gas collected and its disposition; and,
- a closure plan or review of the closure plan and associated costs.

Date Issued: December 4, 1972

Date Amended: (most recent) Page: 3 of 6

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Barry Wood, P. Eng.

Assistant Regional Waste Manager

2.6. Leachate

Should leachate emanate from the refuse site and become detrimental to the environment, a means of mitigating the impact of the leachate will be implemented by the permittee.

2.7. Litter Control

Any litter emanating from the landfill site and scattered into neighbouring property, along roads, in drainage ditches, along litter control fences or elsewhere on the landfill site shall be removed to the satisfaction of the Regional Waste Manager and incorporated into the landfill twice per year, once in the Spring and once in the Fall. Written notification of clean up is to be submitted to the Regional Waste Manager within 7 days of completion. The Regional Waste Manager may specify additional requirements for the control and clean-up of litter pursuant to Section 11 of the Waste Management Act.

2.8. Designating Signs

Suitable signs shall be erected and maintained at designated locations of the site advising users of the specific disposal areas. The lettering on these signs shall be approved by the Regional Waste Manager.

2.9. Surface Water Diversion

Surface water shall be diverted away from the landfill site to minimize contact with wastes on the landfill site.

2.10. Operational Requirements For Regulated Open Burning

2.10.1. Area

The operation shall be restricted to an area on the site which is satisfactory to the Regional Waste Manager. If required this area shall be fenced to restrict access to the burn area stockpile.

2.10.2. Quantity and Frequency

The maximum quantity of wastes to be treated is 150 m³ per burn at a frequency not to exceed once per week. Each burn shall comprise one continuous period necessary to reduce the stockpiled waste to ashes and shall not exceed one operating day.

Date Issued: December 4, 1972

Date Amended:

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Barry Wood, P. Eng.

Assistant Regional Waste Manager

2.10.3. Nature of Wastes

Generally, no waste shall be burned which is unacceptable to the Regional Waste Manager. Acceptable materials may include selected demolition refuse, stumps, trees and similar items, but excluding nuisance causing combustibles such as rubber, plastics, tars, insulation, etc. Animal carcasses are not to be burned. The approval of the Regional Waste Manager shall be obtained prior to open burning any waste not specified as acceptable above

2.10.4. Timing

Burning shall take place only when an attendant is on duty and when conditions promote rapid combustion and dispersion of combustion products. Materials shall be charged to the facility in a manner to promote best combustion and restrict the uplift of lighter constituents. No burning shall take place during periods of fire hazard nor when burning is prohibited by other government agencies.

2.10.5. Fire Control

Devices shall be on site for extinguishing fires to prevent them from spreading to surrounding areas. Such devices may include a pressurized water supply or chemical type fire extinguishers, or an earth stockpile. If an earth stock pile is contemplated for fire control earth moving equipment shall be available at the site. A fireguard shall be cleared and maintained free of combustible material.

2.10.6. Residue of Combustion

As soon as the residue of combustion has cooled to ambient temperature it shall be incorporated into the landfill.

2.11. Additional Requirements

- 2.11.1 In all sections of this permit requiring acceptance or approval by the Regional Waste Manager the permittee shall obtain that acceptance or approval from the Regional Waste Manager in writing.
- 2.11.2 Within 30 days of issuance of this permit the permittee shall submit a letter to the Regional Waste Manager outlining the relevant times of operations pursuant to Section 2, Subsection 2.1 in relation to the words "at the end of each day of public access".

Date Issued: December 4, 1972

Date Amended:

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Barry Wood, P. Eng.

Assistant Regional Waste Manager

3. MONITORING AND REPORTING REQUIREMENTS

3.1. Monitoring/Reporting

On the basis of inspections and other information related to the effects of the discharges on the receiving environment, the Regional Waste Manager may require the permittee to implement a monitoring program and/or install additional pollution control works pursuant to Section 11 of the Waste Management Act. These additional requirements may include implementation of a leachate collection and treatment system.

The permittee shall maintain a visual record of the landfill operation by photographing the active area immediately after the covering operation is completed or immediately after landfill opening in the morning or as soon as lighting conditions allow a photograph to be taken. The photographs shall be maintained in an orderly manner and shall be available for inspection by an officer during normal business hours. In addition, the original photographs shall be submitted to the Regional Waste Manager upon request. After reviewing the original photographs the Regional Waste Manager will return them to the permittee.

4. **DEFINITIONS**

4.1. "Special Waste"

Special Waste will have the meaning as it is defined in Part One of the Special Waste Regulations enacted pursuant to the Waste Management Act.

4.2 "Refuse"

Refuse will have the meaning as it is defined in the Waste Management Act.

Date Issued: December 4, 1972

Date Amended:

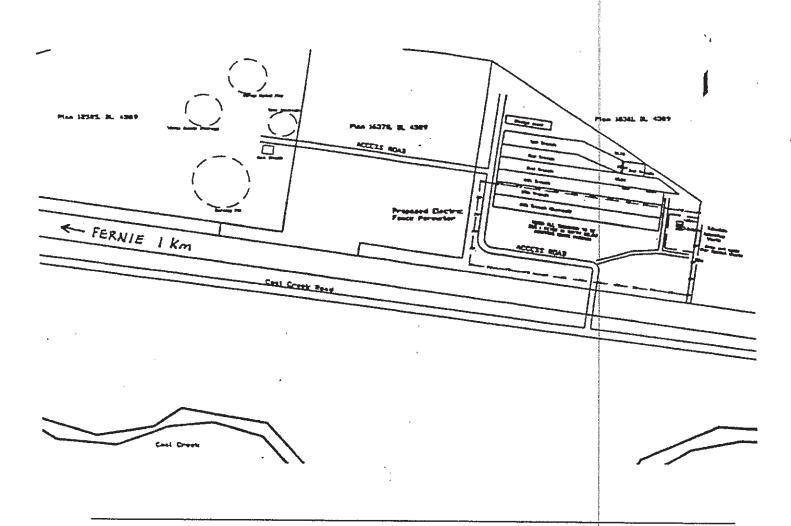
(most recent) Page: 6 of 6

APR 2 6 1995

Barry Wood, P. Eng.

Assistant Regional Waste Manager

Site Plan A



LEGAL DESCRIPTION:

Part of Parcel 89 of District Lot 4589, Kootenay Land District

Permit:

PR-01486

Date Issued: December 4, 1972

Date Amended:

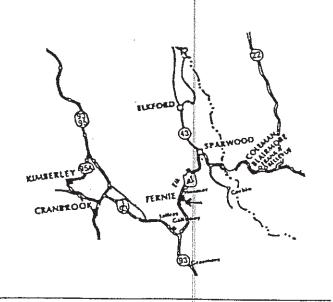
APR 2 6 1995

Assistant Regional Waste Manager:

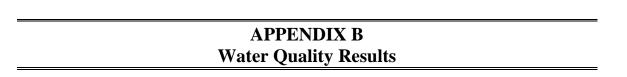
Barry Wood, P. Eng.

Name of Applicant:

The Corporation of the City of Fernie



GENERAL DESCRIPTION



		Sampling L Date S Lab Sa	ocation E25723 ampled 22-Jul-2 mple ID L2480410	5 E257235 0 21-Od-20 I-1 L2521318-5	E257235 13-Jan-21 L2549508-5	E257235 E2 29-Apr-21 27- L2583674-5 L25	257235 E2 1-346-21 11-1 121328-4 L280	257235 E25723 I-Nov-21 21-Oct-2 853287-5 L2521318	E E257236 D 13-Jan-21 I-8 L2549508-11	E257236 29-Apr-21 1 L2583674-12	E257237 22-Jul-20 2 L2480410-2	E257237 22-0xi-20 L2521318-4 L	6257237 621 14-Jan-21 25-1 12549508-4 1.258	57237 E257. Spr-21 11-No 3674-4 L26632	27 E257238 21 22-Oct-20 7-4 L2521318-9	E257238 14-Jan-21 L2545508-12	E257238 E25 29-Apr-21 27-L L2583674-13 L262	7258 E257236 u6-21 22-Ju6-21 328-3 L2485410	0 E257239 0 21-Oct-20 I-3 L2521318-6	E257239 13-Jan-21 L2549508-8	E257229 28-Apr-21 L2583674-7	E257239 E 27-Jul-21 1 L2621328-5 L2	E257239 E25 11-Nov-21 28-Ap 2653287-7 L25838	57240 E257242 Apr-21 22-Jul-20 0674-11 L2480410-	E257242 21-0d-20 4 L2521318-7	E257342 13-Jan-21 L2546508-10	E257242 28-Apr-21 L2583674-9 L	7-Jul-21 11-No 621328-6 L2653	7242 E257243 3+21 29-Apr-21 287-9 L2583674-1	E257244 22-Jul-20 10 L2480410-5	E257244 22-0si-20 L2521318-2	E257244 E 14-Jan-21 25 L2549508-2 L2	E257244 E257 29-Apr-21 11-No 2583674-2 L26632	7244 E257245 bis-21 22-Jul-20 E287-2 L2480410-6	E257245 13-Jan-21 L2549508-9 L	E257245 E2 28-Apr-21 11 2583674-8 L26	257245 E257. -Nov-21 22-Ju 553287-8 L24804	246 E257246 s-20 22-Oct-20 410-7 L2521318-	5 E257246 0 13-Jan-21 i-1 L2549508-1	E2572N6 29-Apr-21 : L2583674-1 L	E257246 E25 27-Jul-21 11-1 2621328-1 L266	257345 E2 1-Nov-21 22 553287-1 L24	2572N7 E2572N 2-Jul-20 22-Oct-2 800410-8 L2521318	E257247 3 13-Jan-21 23 12549508-3	E257247 E25 29-Apr-21 27- L2583674-3 L262	57247 E25724 Jul-21 11-Nov-2 21328-2 L265326	77 E257250 21 22-Jul-20 7-3 L2480410-	E257250 13-Jan-21 9 L2549308-F	E257250 1 26-Apr-2 1-6 L258367/	21 74-6	11- 12°
Table A-1 Water Qualit	Unit CSR AW CSF	Samp Ideline R DW DC SC 160	le Type WOG																																																
Lab Results Anions and Cations in meg/L unit Aluminam (meg/L) (calculated) Barium (meg/L) (calculated) Bicarbonals (HCO3) (meg/L) (calculated) Boron (meg/L) (calculated)	megt NG 5 megt NG 5 megt NG 5 megt NG 5	NG N NG N NG N	0.0005 0.0123 5.75 0.0076 4.79	0.00036 0.00250 6.92 0.0419 5.44	+0.00011 0.0113 5.82 0.0002 4.6	0.00000 0. 0.0104 0. 4.9 3 0.0075 0	00019 <0. 10103 01 5.59 5 0.011 0	0.00011 0.00060 100546 0.00573 5.21 3.52 0.010 0.006 3.71 2.61	0 0.00032 5 0.00971 5.18 0.0078 4.2	0.00139 0.00952 4.93 0.0007 3.92	0.00018 0.00428 9.92 0.0427 8.23	0.00062 0.0004 5.34 0.010 3.68	0.00027 0.0 0.00347 0.0 6.15 8 0.023 0.0 5.79 8	0024 0.000 0479 0.001 13 7.5 2383 0.00 08 5.8	4 =0.00011 9 0.00545 4.97 5 0.0067 3.46	0.00020 0.00705 5.43 0.0051	0.00012 =0.0 0.00510 0.0 4.05 6 0.0056 0.0 4.23 4	0011 0.00026 H3M 0.00264 16 2.92 064 0.0050 19 2.41	0.00042 0.00246 2.95 0.0047 2.2	0.00027 0.0028 3.38 0.0033 2.87	0.00291 0.00224 2.72 0.0036 2.13	0.00275 0.00253 3.39 0.0001 2.36	0.00075 0.00215 1.36 2 0.0000 2.43	0,00019 0,00006 2.11 6.06 0,012 5.24	0.00051 0.00034 6.87 0.015 5.09	0.00027 0.00862 6.85 0.012 5.64	0.00006 0.00818 5.95 0.011	0.00024 0.00 0.00757 0.00 6.31 7.3 0.012 0.0 4.62 5.4	027 0.0173 900 0.00146 39 1.33	0.00018 0.00202 4.1 0.0069	0.00017 0.0002 3.67 0.0007 3.06	0.00012 0 0.00005 0 4.2 0.0072 1	0.00018 0.000 0.00143 0.005 3.54 4.4 0.0054 0.00 2.72 3.8	0012 3215 44 1.85	12	1.07	128 1.9	13 2.31	1.93	1.97	264	1.8	1.55 1.8	1.57	1.11 2	2.29 1.06	3.51	1.52	2.2		
Calcium (meqli.) (calculated) Calcium (total, meqli.) (calculated) Carborate (COD) (meqli.) (calculated) Oltoride (meqli.) (calculated) Ohtomium (meqli.) (calculated)	maqL NG 5 maqL NG 5 maqL NG 5 maqL NG 5 maqL NG 5	NG N NG N NG N NG N NG N	4.79 4.79 5 40.17 5 0.0538 5 40.0000	5.44 +0.17 0.125 58 0.000092 3 0.000327	4.6 +0.17 0.0457 +0.0000038 0.0000076	4.14 · · · · · · · · · · · · · · · · · · ·		3.71 2.61 =0.17 =0.17 0.008 0.003 0.0000008 =0.00000 0.0000378 0.000007 0.0017 0.0023 =0.29 =0.29	4.2 40.17 0.0453 56 <0.000058	-0.17 0.0559 1 <0.000058 0.000009 0.0017 <0.29	6.23 -0.17 0.198 0.000006 0.00004 0.0022 0.0022	3.65 +0.17 0.0364 +0.000055 0.000014 0.0019 +0.29	5.79 8 +0.17 +1 0.119 0 0.0000075 0.00 0.0000570 0.00	0004 0.000 00479 0.000 113 7.5 1385 0.00 008 5.8 147 40.1 210 0.00 000003 0.000 000003 0.0000 000003 0.0000	3.45 -0.17 5 0.0770 63 -0.000058 85 0.000014	4.15 -0.17 0.0736 -0.000058 0.000027 0.0019 -0.29	0.00012 =0.0 0.00510 0.0 4:65 6 0.0056 0.0 4:23 4 -0.17 =-0 0.213 0.0 -0.000008 -0.0 -0.000008 -0.0 -0.000008 -0.0 -0.000008 -0.0 -0.000008 -0.0	19 2.41 17 40.17 195 0.0051 00058 40.00003 1011 0.0022 29 40.29	40.17 0.014 58 40.000038 64 0.0000374 0.0024	2.87 =0.17 0.012 1 =0.000008 0.000084 0.0005 =0.29	2.13 -0.17 0.021 -0.000058 0.000078 0.0021 -0.29	2.35 +0.17 0.019 0.0000075 +0	2.43 1. =0.17 =0. 0.015 0.00 0.0000058	5.24 1.5 0.17 <0.17 0002 0.0347 <0.000005	5.09 40.17 0.0370 8 40.000058	5.54 -0.17 0.0559 -0.000058 0.00018 0.0019 -0.29	-0.17 0.0495 -0.000058 -0.000020 0.0015 -0.29	4.02 5.4 -0.17 -0.0 0.0075 0.00 0.000058 -0.000 -0.0011 0.00 -0.021 -0.00 -0.021 -0.00	104 1.04 17 40.17 164 0.0059 10008 40.00005 1018 0.000019 107 0.0014 29 40.29	3.23 <0.17 0.154 8 <0.000058	1.05 *0.17 1.0 *0.000058	4.0 <0.17 1.59 <0.0000258 <0	2.72 3.8 +0.17 +0.1 0.235 1.2 0.000058 +0.00 0.00012 0.000 -0.005 0.00 +0.29 +0.3		0.983 +0.17 0.006	0.813 I +0.17 0.0042 0	0.948 1.4 +0.17 +0.1 1.0065 0.00	4 1.64 17 <0.17 199 0.02	1.4 +0.17 0.0363	1.31 <0.17 0.015	1.9 1 =0.17 =1 0.011 0	1.18 =0.17 = 0.021 0	1.1 1.23 +0.17 +0.17 1.0034 0.016	1.16 =0.17 0.012	0.734 1 =0.17 =1 0.0071 0.1	1.59 0.634 0.17 40.17 0093 0.0054	2.85 0.22 0.015	1.28 +0.17 0.015	1.55 <0.17 0.0085	,	
Copper (meq.L.) (calculated) Fluoride (meq.L.) (calculated) Fluoride (meq.L.) (calculated) Lead (meq.L.) (calculated) Lead (meq.L.) (calculated) Lithurn (meq.L.) (calculated)		NG N NG N NG N NG N NG N NG N	-0.17 -0.0536 -0.00002 -0.00002 -0.00017 -0.000000 -0.0000000 -0.00000000000000	3 0.0000327 0.0022 +0.29 54 +0.0000048 1 0.00063	0.000076 0.0020 +0.29 +0.0000048 0.00089	-0.17 - 0.0545 - 0.055 - 0	0000000 0.00 0.0011 0. =0.29 = 00000048 =0.00 0.00079 0.0	0000378 0.000007 0.0017 0.0023 <0.29 <0.29 00000048 <0.00000 0.00079 0.00088	40.17 0.0453 58 +0.000058 5 0.000078 0.0058 +0.29 048 +0.0000048 5 0.0090	0.00020 0.0017 +0.29 8 +0.0000048 0.00097	0.000044 0.0022 =0.29 1 <0.0000048 0.00075 2.00	0.000014 1 0.0019 40.29 40.0000048 41 0.00076 0.897	0.000570 0.00 0.0019 0: +0.29 +i -0.0000048 +0.00 0.00096 0.0	00802 0.000 0021 0.00 1.29 +0.2 000048 +0.000 0068 0.000 .84 1.2	85 0.000014 1 0.0019 1 <0.29 048 <0.0000048 0 0.00099	0.000027 0.0019 +0.29 5 +0.0000048 0.00089 1.19	+0.000063 0.00 0.0021 +0.0 +0.29 +0 +0.0000048 +0.00 0.0014 0.0	<0.000000		0.0000894 0.0005 +0.29 8 +0.00000048 0.0010 0.585	0.000878 0.0021 +0.29 0.0000080 0.0011	-0.17 0.019 0.0000075 -0 0.0012 0 0.0012 -0.0000048 -0 0.00157	10.17 -0. 0.015 0.0 0.000058 1.0000055 0.0001 0.000055 0.0001 0.0000045 0.00012 0.0000045 0.00012 0.0000045 0.00012	1.5 0.17 =0.17 0.002 0.0347 0.000000 0.000000 0.000000 0.00000 0.000000	=0.17 0.0370 8 =0.000058 0.00002 0.0002 =0.29 8 =0.0000048 0.00076	0.000018 0.0019 <0.29 1 <0.0000048 0.00084 1.18	0.00020 0.0015 =0.29 =0.0000048 =1 0.00073	000031 0.000 0.0011 0.00 <0.29 <0. 00000048 <0.000 0.00071 0.00 0.971 1.0	2018 0.000019 217 0.0014 29 <0.29 00048 0.000002 085 0.00019 26 0.222	0.00018 0.00202 0.00202 0.00099 3.23 -0.17 0.154 0.000058 0.000058 0.000058 -0.0000058 0.00004 -0.200048 -0.0000068	0.00014 0.0032 <0.29 <0.0000048 < 0.0014 1.23	<0.0000288 <0.0000014 0.0000014 0.00005 1.000000048 <0.000000048 <0.000000048 <0.000000048 <0.00000000000000000000000000000000000	*0.17 *0.0 0.235 12 0.000058 *0.00 0.0005 0.00 0.0005 0.00 0.0005 *0.00 0.0005 *0.00 0.000048 *0.000 0.00180 0.00 1.08 1.4	0015 035 0.0017 29 <0.29 00048	0.002 +0.29	0.0014 0	0.0017 0.00 <0.29 <0.3	123 0.0027 29 <0.29	0.0029	0.0026	0.0012 0. <0.29 4	0.0023 0	1.0024 0.0029 <0.29 <0.29	0.0028	0.0025 01 <0.29 <	0042 0.0021 0.29 <0.29	0.0021	0.0022	0.0022		
Magnesium (megl.) (calculated) Magnesium (total rengl.) (calculated) Pobassium (megl.) (calculated) Pobassium (notal, megl.) (calculated) Sodium (megl.) (calculated)	magt NG h magt NG h	NG N NG N NG N NG N NG N	0.0491 2 0.179	0.185	0.065	0.0435 0 0.177 0	0.173 0	0.0453 0.0271 0.154 0.140	0.0407	0.0402	0.286	0.0453	0.968 Q 0.246 Q	235 0.10	0.0259	0.0338	0.0015 0.0	61 0.58 348 0.019 103 0.155	0.017	0.585 0.018 0.150	0.458 0.016 0.123	0.0263	0.019	0.0425 0.0425 0.126	0.0455	0.0414	0.0407	0.124 0.1	05 0.222 150 0.014 33 0.0452	0.02	0.017	0.019	0.018 0.02	0.28 220 0.015	0.216	0.199	0.184 0.44 0.015 0.01	49 0.558 17 0.015	0.512 0.014	0.395	0.579 0 0.020 0	0.350 (0.409 0.517 0.016 0.015	0.460	0.284 0.	1.580 0.285 1.022 0.012	0.0310	0.35	0.390		
Sodium (total, maqil.) (calculated) Steratium (maqil.) (calculated) Suffate (maqil.) (calculated) Zinc (maqil.) (calculated) Disposed Metals	meqt NG 5 meqt NG 5 meqt NG 5 meqt NG 5	NG N NG N NG N NG N	0.00743 0.0858 0.00014	0.00029 0.369 0.00014	0.00648 0.11 0.00013	0.00652 0.0 0.0933 0.0 0.00014 0.0	00673 0.0 10410 0. 00012 0.0	0.00014 0.00470 0.0079 0.118 0000007 0.000040	0.00612 0.113 9 0.00010	0.0995 0.0995 0.00011		0.00648 0.124 0.00012	0.00842 0.0 0.281 0.0 0.00014 0.0	0139 0.09 360 0.36 00095 0.000		0.00564 0.169 0.00020	0.00653 0.0 0.310 0: =0.000031 0.00	9564 0.00850 171 0.135 0043 0.000041	0.00909 0.1 9 =0.000031	0.00817 0.0099 0.000043	0.00796 0.112 0.000040		0.000031	0.00879 0.00879 0884 0.0537 0.00022		0.00852 0.0747 0.00028	0.00877 0.0539 0.00027	0.00840 0.00 0.0460 0.01 0.00022 0.00	995 0.00176 F12 0.0508 019 40.000031	0.00009 0.302 0.000045	0.0087 0.373 0.000034	0.00975 0 0.25 0.000055 +0	0.00774 0.01 0.237 0.30 0.000031 <0.000	0.085 111 008 0.0685 00031	0.0992	0.0021 0	0.0570 0.06	139 0.112	0.104	0.0587	0.0079 0.0	0.0706 0	0.117 0.0816 0.105	0.106	0.0505 0.	0.0435	5 0.0902	0.0570	0.0886		
Annisum (dissolved) Antimory (dissolved) Arsimory (dissolved) Barker (dissolved) Barker (dissolved)	рат. NG 950 рат. 90 рат. 50 г. рат. 10000 го	500 ³¹ 95 6 6 10 1 10000 N	00 4.7 +0.10 5.15 2 844 40.000	3.2 0.18 0.17 172 +0.000	+1.0 +0.10 4.08 776 +0.020	2.7 +0.10 -4 4.94 -715 +0.000 -4 +0.000 -4 27 27 0.000411 0.0 83000 -9		*1.0 5.4 0.13 *0.10 4.05 2.55 650 395 *0.020 *0.020	2.9 +0.10 3.33 667 +0.000	12.5 +0.10 4.03 654 +0.020	1.5 0.2 0.25 284 +0.020 +0.000 154 0.000125 950000 0.1	5.6 0.13 4.85 715 <0.000 <0.000 37 0.000124 73700 e0.10	2.4 0.23 0 0.19 0 238 *0.020 *0	22 13 221 0.2 233 0.2 239 291 200 40.0 200 40.0 2000 1770 211 0.1	41.0 40.50 0.17 375 0 40.020	1.8 +0.10 0.17 484 +0.020	1.1 < <0.10 < 0.11 0 350 2 <0.000 <0	1.0 2.3 10 0.1 15 0.17 88 181 020 +0.020	3.8 0.13 0.19 169 40.000	2.4 0.23 0.14 190 40.020	25.2 0.11 0.15 154 +0.020	24.7 0.15 0.25 174 +0.000	6.7 0.16 0.22 148 +0.020	1.7 -0.10 0.71 602 -0.000 -0.000 44 0.00002 500000	4.6 0.13 0.68 573	2.4 0.14 0.64 592 +0.020	3.2 +0.10 0.91 562 +0.000	2.2 2. 0.11 +0. 0.75 1.1 520 61	4 155 10 40.10 12 0.17 8 100 200 40.000	1.5 +0.10 +0.10 139 +0.000	1.5 +0.10 0.11 150 +0.020	1.1 0.11 <0.10 141 <0.020	1.6 1.1 +0.10 +0.1 +0.10 0.1 98.2 14 +0.000 +0.0	1 50 12 60																	
Barruth (dissolved) Boron (dissolved) Cadminn (dissolved) Calcium (dissolved) Chromium (dissolved)	pgit NG 5 pgit 12000 50 mgt Cale 14 00 pgit NG 5 pgit 10 10 10 10 10 10 10 10	NG N 3000 50 1005 0.0 NG N 10 ¹³ 5	2 40.050 50 28 05 0.000045 2 95900 5 40.10	+0.020 +0.050 151 0.0000578 100000 0.16	+0.020 +0.050 33 0.0000381 92100 +0.10	*0.050 *1 27 0.000411 0.0 83000 8 *0.10 *	-0.10 0 4.51 4.51 4.51 4.51 4.51 4.51 4.51 4.51	=0.020 =0.020 =0.050 =0.050 36 20 000359 0.000043 74400 52400 =0.10 =0.10	40.050 28 94 0.000136 84100 40.10	<0.020 <0.050 24 0.0000812 78500 <0.10			+0.020 +0 +0.050 +0 53 0,000,002 0,0 110,000 16 0,13 0			<0.020 <0.050 22 0.000657 83400 <0.10	#0.000 #0 #0.050 #0 20 :: 0.0000548 0.00 84700 84 #0.10 #0	050 +0.050 3 18 00431 0.000035 000 48300 10 +0.10	<0.000 <0.000 17 4 0.0000187 45000 <0.10	40.050 12 0.0000213 57600 40.10	+0.050 13 0.0000198 42700 +0.10	174 <0.009 <0.000 22 0.0000047 0. 47300 0.13	+0.000 +0.000 18 18 10000154 40700 +0.10 +0.10 2.21 147 +10	40.000 44 0.000322 105000 40.10	+0.050 55 0.000877 922000 +0.10	+0.020 +0.050 43 0.00119 113000 +0.10		-0.000 -0.0 -0.050 -0.0 43 44 000785 0.00 92500 1000 -0.10 -0.	200 <0.020 250 <0.050 8 <10 1771 0.0000071 000 20800 10 <0.10	0.0000797 64800	+0.020 +0.020 24 0.000713 61400 +0.10 40.10 0.43 4.10 0.43 1.10 1.10 1.10 1.10 1.10 1.10 1.10 1.1	*0.020 *0.050 *0.050 *0.000595 *0.0000595 *0.100 *0.10	1.6 1.1 40.10 40.1	050 5 0516 000																	Ī
Cobalt (dissolved) Copper (dissolved) Herdness, Total (dissolved as CaCCO) Iron (dissolved) Lead (dissolved)	pgt	100 14 200 NG N 100 14 N 100 15 N	3.09 11 0.72 2 293 2 2880 0.098 2 5.4 2 13.1 0 1480	0.12 1.04 340 +10 +0.050	2.74 0.24 283 2500 <0.050	2.69 0.98 253 2170 0.131 4 5.7	2.34 1.25 1.25 1670 1 0.050 4	1.94 0.94 1.20 0.24 225 167 1090 805 -0.050 -0.050 5.5 6.8	29 40.10 3.33 667 40.000 40.000 28 40.000 28 40.000 28 40.000 60.0000 60.00000 60.0000 60.00000 60.0000 60.00000 60.0000 60.0000 60.00000 60.00000 60.00000 60.000	2.58 0.64 242 2150 <0.050	0.18 1.4 511 410 40.050 5.2 24.3 4.32	2.22 0.44 229 1890 <0.050	0.2 0 1.81 2 353 4 410 40.050 40	19 0.1 255 1.5 196 39 11 41 1050 40.0	+0.50 0.43 228 +10 0 +0.050	0.38 0.86 268 61 +0.050	0.13 0 =0.20 0 292 2 =10 = =0.050 =0	14 <0.10 51 1.06 91 150 10 <10 050 <0.050	+0.10 1.19 139 +10 +0.000	+0.10 2.84 173 +10 +0.050	*0.10 2.79 129 22 0.062	+0.10 4.21 148 24 +0.050	<0.10 2.21 147 <10 <0.000	5.11 0.77 319 510 -0.000 4.9	-0.000 -0.000 55 0.000877 920000 -0.10 429 0.67 300 266 -0.000 5.3	4.46 0.56 341 304 40.000 5.8	5.70 0.64 306 484 40.050	2.80 4.7 0.98 0.5 280 32 257 48 <0.050 <0.0	77 =0.10 57 0.60 85 63.1 85 63 85 63 85 63	+0.10 0.51 229 +10 +0.050	<0.10 0.43 215 <10 <0.050	<0.10 0.46 285 <10 <0.050	 40.10 40.1 0.38 0.5 190 26 410 411 40.050 40.0 	10 52 52 10 0050																-	ļ
Magnesium (dissolved) Magnesium (dissolved) Marcuy (dissolved) Marcuy (dissolved) Mobbdersum (dissolved) Nickel (dissolved)	mgt. NG 5 µgt. NG 150 µgt. 0.25 µgt. 10000 2 upt. Cpic 15	NG N 100 ¹⁴ 12 1 1 250 5			12.8 2680 <0.0000 1.02 4.13	11.1 2350 2	11.0 S 2110 1 0.0050 40	9.47 8.9 1740 800 0.0050 <0.0050 120 1.25 3.11 1.87	12 2110 -0.0050 1 4.71	11.2 1970 -0.0050 0.862	24.3 4.32 0.007	10.9 2130 =0.0050 1.36	15.5 2 61 2 <0.0050 <0 0.14 0	2.4 15. 271 1.2 0050 +0.00 159 0.11	13.4 78.3 ID <0.0050 I 0.64	14.5 1230 +0.0000 0.843	19.4 19 1130 2 40.000 40 1.60 1 2.39 1	1.6 7.1 135 0.21 1050 17 0.652 13 40.50	6.34 0.27 <0.0050 0.731	410 40.000 7.1 7.11 0.86 40.000 0.534 40.50	556 123 -0.0000 0.034 -0.50 -50 640 0.231	7.17 1.75 <0.0050	6.14 0.82 <0.0050 0.887	13.5 ff40	13.3 5510 +0.0050 0.585	14.3 1780 +0.0050 0.468	12.8 2020 <0.0050 0.440 9.92	11.8 13 5400 18 0.0050 40.0 0.454 0.5 7.56 8.3	1 2.70 10 1.73 050 <0.0050 63 0.192 76 <0.50	16.4 7.55 0.306	94.9 0.37 +0.0050 0.317 +0.50	13.8 20 0.39 -0.0050 - 0.389 -0.50 -50 730	13.1 17. 0.47 0.3 +0.0050 +0.00 0.379 0.31	14 36 3050 312																-	
Phosphorus (dissolved, by ICPMS/ICPCES) Potassium (dissolved) Selenium (dissolved) Silicon (dissolved, as Si) Silicon (dissolved, as Si)	pgt NG b ppt NG b ppt 20 1 ppt NG b ppt 20 1 ppt NG b ppt NG b	NG N NG N 10 1 NG N 20 N	1.02 4.5 4.5 5 450 5 1920 6 40.00 5 40.00 5 40.00 5 40.00 5 40.00	+50 7250 0.225 4850 +0.010 8.09 407	450 1890 40.050 4710 40.010	=0.0050 =0 1.04 4.14 =50 1700 1 =0.050 0 4430 4 =0.010 4 4.05 290	1.90 1 3.55 3 450 1 500	9.47 8.9 600 0.0050 40.0050 40.0050 40.0050 40.0050 40.0050 40.0050 40.0050 40.0050 40.005 40	+50 1590 +0.050 4270 +0.010	6.7 11.2 1970 -0.050 0.862 5.34 -30 1570 -0.050 4130 40.050 4130 287 1840 287	0.097 1.46 450 11200 0.11 5670 -0.010 9.39 565 8670	2.22 0.44 229 5500 53 10.9 2.33 40.000 1.36 40.000 1.34 45 45 45 45 45 45 45 45 45 4	-500	119 0.15 155 155 155 155 155 155 155 155 155	-50 1170 1 +0.050 4260 0 +0.010	+50 1300 +0.050 4040 +0.010 4.11	9.5 8 19.4 19.4 19.4 19.4 19.4 19.4 19.4 19.4		=0.10 1.19 139 =10 -0.000 7.9 6.34 -0.000 0.731 -0.00 -0.50	-50 690 0.52 3570 -0.010	<50 640 0.231 3040 <0.010	-0.10 -0.10 -0.10 -0.10 -0.10 -0.00	+50 740 0.310 3330 +0.010	0.444 11.1 450 1660 40.650 4320 40.010 2.89 385	+50 1780 0.094 4450 +0.010	54.3 1790 -0.0059 0.468 0.87 -50 0.002 4299 -0.010 3.06 373 1480	12.8 2020 40.0050 0.440 9.92 450 1500 1500 40.000 40.000 40.000 3.14 1300	2.80 4.3 0.09 0.5 0.09 0.5 200 2.2 200 2.2 257 48.9 0.000 0.00.4 4.9 6. 11.8 13. 14.00 189 14.00 189 0.0454 0.5 0.454 0.5 0.454 0.5 0.454 0.5 0.454 0.5 0.454 0.5 0.454 0.5 0.6454 0.5 0.6454 0.5 0.6454 0.5 0.6454 0.5 0.6454 0.5 0.6454 0.5 0.6454 0.5 0.655 0.6 0.655 0	.1 2.70 102 1.73 109 1.73 100 1.73 100 1.0050 103 0.192 10 40.005 10 450 10 450 10 540 10 40.000 10 40.000 10 40.000 10 1.000 10 77.3 10 1200	0.306 =0.50 =50 800 0.502 3900 =0.010 3.13 366	94.9 -0.0059 0.317 -0.0059 0.317 -0.50 670 0.338 3780 -0.010 3.87 380 6400	450 730 0.507 3310 40.090	13.1 17. 0.47 0.3 -0.0000 -0.00 0.379 0.3 -0.500 -0.5 -0.500 0.0 0.412 0.5 -0.000 -0.0 0.412 0.5 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.0 -0.000 -0.000 -0.0 -0.000 -	50 50 50 50 50																	
iodum (dissolved) ihonium (dissolved) klipher (dissolved) hallum (dissolved) In (dissolved)	mgt NG 20 pgt NG 2 pgt NG 5 pgt 3 5 pgt 3 5	00 ³³ N 1500 70 NG N NG N	3710	6740 <0.010	4 22 284 2120 0.085 +0.10	4.05 290 1960 0.103 0 +0.10 =	0.112 0	3.54 3.22 269 206 1490 1970 0.106 0.055 40.10 40.10	3.88 268 1990 0.992 +0.10	3.85 287 1840 0.102 +0.10	9.99 565 8670 0.039 +0.10	0.000	5.65 S 389 4 5150 7 0.024 0 0.14 0	004 +0.0	0.001	4.11 247 2940 0.039 +0.10	0.045 01	67 3.57 21 391 10 4420 115 40.010 10 40.10	#0.010	3.45 358 1520 +0.010 +0.10	2.82 331 2120 +0.010 +0.10	534 479 3060 40.010	151 423 2340 +0.010 +0.10		3.11 408 1360 0.054 +0.10	3.06 373 1480 0.065 40.10	0.055	0.036 0.0	25 1.04 23 77.3 80 1200 89 40.010 10 40.10	#0.010		5.07 427 4530 40.090 40.10	3.03 4.7 339 45 4400 547 40.010 40.0	74 EF 70 010																-	
Tanium (dasolad) Uranium (dasolad) Vanadum (dasolad) Drc (dasolad) Zrconium (dasolad)	pgit. 9000 b pgit. 85 3 pgit. NG 3 pgit. Cale 12 300 pgit. NG b	NG N 20 2 20 N 00 ¹⁴ 30 NG N	40.10 40.30 0 0.567 2 40.50 0 4.7 2 40.30	-0.30 0.979 -0.50 4.7 -0.30	*0.30 0.492 *0.50 4.3 *0.30	0.103 0 =0.10 = =0.30 = 0.537 0 =0.50 = 4.6 =0.30 =	-0.30 < 0.390 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.105 0.055 +0.10 +0.10 +0.30 +0.30 0.425 0.432 +0.50 +0.50 2.2 1.6 +0.30 +0.30	0.092 +0.10 +0.30 0.51 +0.50 3.3 +0.30	0.102 <0.10 <0.30 0.652 <0.50 3.6 <0.30	0.009 -0.10 -0.30 1.96 -0.50 3.4 -0.30	+0.10 +0.30 0.492 +0.50 3.9 +0.30	+0.30 +1 1.05 2 +0.50 +1 4.7 +0.30 +1	115 0.9 1.30 +0.3 1.27 1.0 1.50 +0.5 1.1 1.2 1.30 +0.3	*0.30 0.791 1 *0.50 1.6 1 *0.30	+0.30 0.669 +0.50 6.4 +0.30	40.10 40 40.30 40 1.47 1. 40.50 40 41.0 1	30 <0.30 41 0.169 50 <0.50 4 1.6 30 <0.30	+0.10 +0.30 0.165 +0.50 +1.0 +0.30	<0.30 0.308 <0.50 1.4 <0.30	0.33 0.172 +0.50 1.3 +0.30	+0.30 0.228 +0.50 2.0 +0.30	-0.30 0.255 -0.50 -1.0 -0.30	-0.10 -0.30 -0.35 -0.50 7.3 -0.30	=0.10 =0.30 1.22 =0.50 10.8 =0.30	0.065 +0.19 +0.30 1.06 +0.50 9.3 +0.30	+0.10 +0.30 1.07 +0.50 8.7 +0.30	+0.10 +0. +0.30 +0. 0.770 1.3 +0.50 +0. 7.1 6. +0.30 +0.	30 1.97 30 0.065 50 <0.50 1 <1.0 30 0.56	<0.10 <0.30 0.246 <0.50 1.5 <0.30	+0.010 +0.10 +0.30 0.233 +0.50 1.1 +0.30	<0.000 <0.10 <0.30 0.285 <0.50 1.8 <0.30	+0.010 +0.0 +0.10 +0.1 +0.30 +0.3 0.232 0.28 +0.50 +0.5 +1.0 +1. +0.30 +0.3	30 97 50 10																-	
General and Inorganic Parameters Abalinity (bbsl, as CaCO2) Ammonia (bbsl, as Ny Biscribonala (PCO3) Bischemical organ demand Carbonala (CO3)	mgt. NG 5 pgt. Csic ts 5 mgt. NG 5 mgt. NG 5	NG N NG N NG N	287 2 469 2 351 2 2.2	346 11 422 420	291 425 355 42.0	245 377 299 *2.0	280 385 341 3.5	261 177 352 147 318 215 42.0 2.9	259 291 316 <2.0	254 273 301 23	495 499 605 +2.0	267 380 326 3	307 4 11.3 3 375 4 42.0 4	106 371 129 23 196 46 2.0 <2	248 24.7 303 42.0	271 127 331 <2.0	233 3 66.4 5 284 3 <2.0 <	29 146 18 29.5 16 178 1.0 <2.0	148 13.9 180 -2.0	103 12.6 206 +2.0	136 10.0 166 *2.0	169 30.9 207 45.0	168 10 <5.0 <5 205 12 <2.0 <2	106 303 -5.0 101 129 370 -2.0 -2.0	344 47.8 419 <2.0	343 47.6 416 42.0	297 59.7 363 +2.0	316 36 51.7 73 385 45 <2.0 <2	9 65.5 3 8.4 H 81.3	205 26.2 250 <2.0	183 22.5 224 42.0	210 7.2 295 *2.0	190 22 8.6 26 222 27 42.0 42	23 92.4 11 40.5 71 113 20 42.0	58.2 +5.0 71 +2.0	53.3 7.3 65.0 42.0	64.3 96: 6.4 21: 78.4 11: +2.0 +2.	5 116 6 <5.0 8 141 0 <2.0	95.9 +5.0 118 +2.0	98.5 +5.0 120 +2.0	132 8 5.5 1 161 1	89.9 10.9 110 +2.0	77.4 90.4 41.1 <5.0 94.4 110 <2.0 <2.0	78.3 +5.0 95.5 +2.0	55.6 1 7.9 4 67.8 1	115 53.0 15.0 38.5 140 64.7 12.0 42.0	187 242 214 +2.0	75.9 8.5 92.6 <2.0	110 5.5 134 +2.0	-	=
Chieride	mgL NG h mgL NG h h mgL NG h μgL NS h μgL 1500000 2500 μgSom NG h μgL Calc ¹⁰ 15	NG N NG N 1000 ³⁴ N NG N	5 <5.0 5 31000 5 2260 5 534 50 32	<5.0 <10000 5510 627 41	45.0 55000 1620 493 38	<5.0 34000 4 2290 1 449 <20	<5.0 - 40000 5 1740 1 468 - 420	<5.0 <5.0 50000 16000 990 810 450 284 32 43	45.0 410000 1640 459 34	45.0 16000 1600 460 33	*5.0 16000 7010 910 42	<5.0 61000 1290 431 36	+5.0 + 24000 H 4220 7 576 :	5.0 <5. 3000 1900 440 353 725 69- 40 39	+5.0 25000 2730 384 37	+5.0 +90000 2610 472 37	<5.0 < 19000 +10 7500 71 473 5 30 <	1.0 <5.0 000 35000 60 150 29 285 20 42	45.0 195000 460 254 46	45.0 150000 430 303 48	*5.0 90000 740 258 39	45.0 377000 690 300 23	+5.0 +5 64000 140 550 28 299 20 39 3	 -5.0 -5.0 4000 17000 220 1230 207 553 36 31 	*5.0 16000 1310 532 38	+5.0 22000 1980 570 36	*5.0 15000 1760 515 28	<5.0 <5 21000 250 1330 19 509 62 <20 3	.0 <5.0 14000 30 290 22 131 2 26	4500 46000 5450 418 64	45.0 87000 37000 451 61		45.0 45. 43000 280 8330 450 375 54 67 66	50 +5.0 200 +10000 200 119 63 182 6 33	<5.0 19000 200 109 40	45.0 29000 150 106 27	<5.0 <5.13000 <100 230 38 119 19 33 43	.0 <5.0 000 <10000 0 800 11 209 3 51	+5.0 +10000 1250 186 56	-5.0 14000 520 192 49	+5.0 + +10000 +1 400 1 232 1 22	<5.0 +10000 < 750 156 44	+5.0 +5.0 +10000 +10000 120 560 153 166 45 55	45.0 410000 430 154 53	+5.0 +17000 +1 250 2 114 2 47	+5.0 +5.0 10000 +10000 330 199 203 97.4 79 39	5.6 0 15000 540 338 39	-5.0 26000 540 142 41	+5.0 11000 300 210 42	C	_
Controlled (CPH) Hydroxide (CPH) Brain (an N) Brain + Nhrin (an N)	mgt. NG 9 mgt. 400 110 10 mgt. 400 111 10 mgt. 400 110 10 pgt. Calc 111 10	NG N 0 2 20 5 0 2 21 N 0 2 22 N 1000 10	2 45.0 0 0.0549 2 2 30 14.6	9.52 9.53 9.53	+5.0 0.0093 0.0093 +1.0	+5.0 0.0051 0 0.0051 0 0.0051 0	+5.0	+5.0 +5.0 0.0070 0.0421 0.0080 0.0432 0.0080 1.1	45.0 0.0067 0.0067	+0.0050 +0.0051 +0.0051 +0.0051	+5.0 0.418	<5.0 0.0295 0.0283 4.7	19 0 19 0 19 0	50 +5 871 3.5 875 3.5 875 3.5 63 1.1	45.0 0.908 0.908	-5.0 0.0286 0.0286	-5.0 -0.0000 0.0 -0.0001 0.0 -0.0001 0.0 -1.0 1	10 <5.0 529 0.0581 540 540 1 <1.0	0.17 0.17 41.0	+5.0 0.111 0.111	+5.0 0.0428 0.0428 0.0428 +1.0	0.117 0.118 0.118	45.0 45 0.105 0.0 0.105 0.0 0.105 0.0 41.0 41	-5.0 +5.0 .0108 0.0101 .0108 .0108 .1.0 +1.0	0.0492 0.0503	45.0 0.011 0.011	+5.0 +0.0050 +0.0051 +0.0051 +1.0	<5.0 <5.0 c5.0054 0.01 0.0054 0.01 0.0054 0.01 <1.0 <1	.0 <50 123 <0.0050 123 <0.0051 123 <0.0051 .0 <1.0	45.0 0.0126	45.0 0.0241 0.0241 41.0	<5.0 0.0106 (0.0106 (67 60 <5.0 <5. 0.0087 0.01 0.0087 0.01 0.0087 0.01 <1.0 <1.	50 +5.0 103 0.0199 103 103 100 +1.0	+5.0 0.0386 0.0386	45.0 0.0670 0 0.0670 0 41.0	+5.0 +5.0 0.0810 0.09 0.0810 0.0810 +1.0 +1.	0 45.0 0.0157 0.0157	+5.0 0.0484 0.0484	+5.0 0.0656 0.0656 0.0456 +1.0	<0.0050 01 <0.0051 01 <0.0051 01 <1.0 «	<5.0 0.0195 0 0.0195 0.0195 <1.0	45.0 45.0 2,0054 0,0065 0,0065 41.0 41.0	+5.0 0.0552 0.0552 +1.0	+5.0 + 0.0803 04 0.0803 04 41.0 +	-5.0 +5.0 0103 0.0435 0103 0.0435 0103 0.0435 +1.0 +1.0	+5.0 +0.0050 0 +0.0051 +1.0	45.0 0.0873 0.0889	45.0 0.0088 0.0088 0.0088	5 6 6	
diphate uphate properature when received by lab this organic curbon tal suspended solids	MG MG MG MG MG MG MG MG	NG N 30 ³³³ N NG N NG 4 NG N	7.67 2 4.17 3 7.9	8.03 17.7 3.43	8.07 5.4 6.8 1280	*20 *5.0 0.0051 0.0051 0.0051 0.0051 0.1051	7.97 1 1.97 4 20.5 2	7.50 8.2 4.22 5.65 21.3 15.7 3.5 67.2	8.95 5.41 3.12 37	8.35 4.45 20.1 4.12	10.9 5.8 7.39 16.1	8.02 5.97 17.8 1170	8.12 7 13.5 1 6.54 6 13.7 1	95 7.2 7.3 (8) 9.9 21/ 109 6.2 2.4	8.18 8.83 2.8 98.2	8.19 8.14 3.67 95.9	7.98 8. 54.9 5 20.1 2 2.79 1.	02 7.78 10 6.47 15 17.7	7.79 7	7.79 4.32 15.8 1900	8.29 5.37 19.9 20.0 2150	7.83 7.63 20.5 84.9	7.54 8.2 5.91 3. 21.1 29 11.4 5.2	1.0 7.02 3.19 2.58 20.3 5.22 4.62 3.1	7.95 3.42 5.2 108	3.2 155	2.59 2.59 20.3 4.54 52.6	7.87 7.4 2.21 3.4 20.5 21 5.45 8	11 7.95 12 2.44 5 20.5 1 5.85	7.7 14.5	7.88 17.9 32 1120	8.11 12 4.76 97.2	8.39 7.3 11.4 14. 20.0 20. 9.5 9.3 371	94 8.17 16 3.29 17 2 3.12	7:96 2:37 9:18 22:3	7.75 1.54 20.0 8.52 28.5	7.83 8.0 2.71 3.6 21.2 6.45 2.9 1.4	5 8.18 11 5.16 11 1.58 11.0	8.19 5.14 2.99 2.3	8.13 3.82 20.2 4.39	7.84 7 3.26 3 20.4 2 1.41 5	7.67 3.39 20.7 5.00	8.07 8.15 3.92 5.04 2.79 2.38 2.6	8.17 4.64 3.66 4.9	7.92 7 2.79 3 19.9 2 7.21 1	7.69 7.70 1.52 2.81 30.5 20.9 1.29 5.58 1.2 1.8	8.41 2.89 5.17	8.08 2.45	8.22 3.20 19.9 6.01 3.7		
dal Metala aminum (lotal) dimony (lotal) senic (lotal)	pgt NG 920 pgt 90 pgt 50	00 ²¹¹ 95 6 6	30																				26 +0.	260 0.10 0.25										70.5 0.15 0.2	1760 0.11 0.64	2130 0.13 0.92	419 20.1 +0.10 0.1 0.34 0.2	8 6.5 8 0.1 11 0.22	232 0.11 0.2	89.6 0.12 0.23	5.6 3 0.13 0 0.37 0	37.3 0.13 0.22	19.7 12.1 0.14 0.1 0.2 0.2	354 0.11 0.26	449 1 0.14 0 0.36 0	11.5 157 2.13 0.11 2.36 0.24	461 0.17 0.61	2770 0.15 1.02	303 +0.10 0.31	-	
onal Mariana univariana (Isaka)	pgt 10000 10 pgt 1.5 pgt NG 5 pgt 12000 50 pgt Calc List	8 N NG N 3000 50	2 2 2 3 0																				10 +0.0 +10 -10.0	123 0.020 0.050 410 0.086										136 <0.020 <0.050 <0.050 <10 0.0123	127 0.089 <0.050 <10 0.0379	2130 0.13 0.92 122 0.130 +0.050 +10 0.0393 0.3 2.12 0.79	97.6 211 0.024 <0.0 0.050 <0.0 <10.050 <0.0 <10.050 <0.0 110.0126 0.05 110.0 25 0.046 <0.1 0.11 <0.1	6 239 300 +0.020 350 +0.030 0 +10 121 0.0384	<0.020 <0.020 <0.050 <10 0.0437	213 =0.000 =0.000 =10 0.0350 26.2 0.20 =0.10	202 1 =0.020 =0 =0.050 =0 13 = 0.0419 0.0	146 +0.020 < +0.050 < +10 0.0274 0	201 247 +0.000 +0.000 +0.000 +0.000 +10 +10 2.0421 0.0004	-0.020 -0.020 -0.050 -10 0.0441	155 3 0.031 40 40.050 40 410 0.0720 01	308 138 3 020 +0.020 3 050 +0.050 13 +10 0416 0.0453	214 0 0.039 0 40.050 13 5 0.067	161 0.153 +0.050 +10 0.11	+0.020 +0.020 +0.050 +10 0.0223	0	
homium (lobal) homium (lobal) sobalt (lobal) sopper (lobal) reference, Total (lobal as CaCOS) reference, Total (lobal as CaCOS)	pgt 10 ¹¹⁶ 50 pgt 40 20 pgt Calc 13 150 mgt NG 5	NG N	ji)																				-0.	0.27 0.10 0.53 94.5										40.10 40.10 40.10 40.50 88.5			0.46 +0.1 0.46 +0.1 0.11 +0.1 2.18 0.6 56.7 50 299 32	12 <0.50 7 110	0.25 +0.10 0.51 98.1 142	0.65 85.3	0.11 4 40.10 4 40.50 0 124 7	40.10 +0.10	22 26.7 +0.10 +0.10 +0.10 +0.10 +0.50 +0.50 75.3 87.6	0.36 <0.10 0.64 81	0.65 0 0.19 d 1.14 d 50.9 1	0.11 0.27 0.10 +0.10 0.50 0.77 107 45.9	0.53 0.24 2.29 176	2.16 0.6 2.71 81.2	0.42 +0.10 0.65 97.6	-	
frium (lotal) agnesium (lotal) anganese (lotal)	pgt. Calc 111 pgt. NG mgt. NG 5 pgt. NG 150 pgt. NG 150 pgt. NG 150	50 5 8 N NG N 00 234 13	2 2																															0.057 3.5 3.4 1.54	0.644 3.4 2.63 17.3 -0.0050 0.348 1.39 71	1.25 3.8 2.30 28.6 *0.0050 *1	0.210 0.00 2.7 7.5 2.24 5.4 3.34 9.9 0.0050	54 +0.050 5 8.3 85 6.78 87 54.4 +0.0050	0.085 9 6.22 3.40 *0.0000	0.053 5.6 4.80 1.18	*0.050 *0 9.9 * 7.04 4 3.85 5 *0.0050 *0	-0.050 4 4.9 4.25 9.86 0.0050 0.423 4 0.62	9.2 11.7 4.97 6.28 1.24 1.65	0.152 10.2 5.59 4.52	0.326 =0 5.0 1 3.45 6 10.9 0 +0.000 =0	1.050 0.103 12.1 5.0 5.80 3.23 3.43 3.05 1.0050 40.005	0.688 4.7 7.96 23	1.37 4.5 4.2 66 <0.0050 1.16 2.83	0.170 3.1 4.74 9.42 9.009	150	
lybdenum (lobal) Sel (lobal) Osphorus (lobal, by ICPMS1CPCES) Isasium (lobal) Benlum (lobal)		250 8 80 8 NG N NG N																					0.6 -0. -1 71 0.1	1637 0.50 -50 750 1134										0.272 =0.50 =50 500 0.088	0.348 1.39 71 980 0.159	0.238 2.24 89 1290 0.139	0.256 0.53 0.97 +0.5 +50 +56 500 660 0.173 0.2	26 0.544 50 <0.50 0 <50 0 570 0 0.256	0.434 +0.50 +50 500 0.443	0.429 +0.50 +50 610 0.477	0.624 0 +0.50 0 +50 - 770 5 0.204 0		*0.0050 0.403 0.558 *0.50 *0.50 *50 *50 620 580 0.345 0.325 2000 1540 6,019 *0.010 1,53 2.68	4.52 0 +0.0000 0.505 0.55 +50 0.00 0.425	0.401 0. 0.99 4 450 4 570 8 0.490 0.	1711 0.343 0.50 0.69 *50 *50 850 450 1,258 0.502	1.11 1.84 67 1210 0.121				
ilicon (total, as 5) Ner (total) odium (total) transium (total) ulphur (total)	1000 1000	NG N 20 N 30 N 30 N 500 70 NG N	2 2 3 30 2																				35 +0.1 1.1 10 10	1.104 3.0 4.70 5.02 6.02 6.02 6.03 6.03 6.03 6.03 6.03 6.03 6.03 6.03										3180 <0.010 1.5 175 2780 <0.010	900 0.159 4940 0.025 1.36 101 1100 0.037	2.16 50.11 2000 1.26 1.26 1.38 2.30 2.30 2.36 0.238 0.238 1.200 0.238 1.200 0.139 1.200 0.0000 4.100000 4.114 99.6 5000 0.0000 6.0000 4.00000 6.00000 6.00000 6.00000 6.00000 6.00000 6.0000000 6.000000 6.00000000	0.210 0.00 2.7 7.1 2.7 7.2 2.24 5.4 3.34 9.9 0.0000 0.256 0.50 0.97 e0.0 450 650 0.97 0.0 1.73 0.2 3.256 221 0.000 e0.0 1.131 0.4 1.10 0.0 1.210 321 1.10 0.0	10 1960 910 40.010 17 2.58 07 117 10 1740	942 0.066 9 6.22 3.48 1 = 0.0650 0.434 40.50 500 0.443 2220 1.010 2.30 28.4 2180 40.010	4.80 1.18 -0.0000 0.429 -0.50 -0.0 -	15	510 0.403 (1910 (40.010 (1.35 79.4 1460 (1.24 1.65 40.0000 0.460 0.500 40.50 40.50 450 500 500 500 0.345 0.325 2000 1940 40.010 40.010 90 102 3360 100	0.425 0.425 2410 0.000 2.44 88.3 2040	2400 5 0.025 40 1.16 2 65.4 1 1110 5	2.050 0.100 2.21 5.0 2.21 5.0 2.22 3.0 2.23 3.0 2.24 3.0 2.050 -0.000 2.7711 0.343 0.000 0.60 0.600 450 0.600 450 0.600	5160 0.018 2.27 260 3010	1330 0.198 7070 0.038 1.31 99.9 1220 0.085	780 0.131 3660 -0.010 1.50 154 1160 0.011	1	
Accory (tola) (highware flowl) (highware	μgt. 3 5 μgt. NG 22 μgt. 1000 5 μgt. 85 2 μgt. 85 2 μgt. NG 22 μgt. NG 2 μgt. NG 2 μgt. NG 5 3 μgt. NG 5 5 μgt.	NG N 1500 N NG N 20 2	2 2 3 3 3 3																				00 40 3: 01	0.10 0.10 3.28 1.125 0.76										<0.010 <0.10 0.76 0.084 <0.50	0.037 +0.10 22.5 0.905 3.26	0.051 - +0.10 - 54.9 - 0.095 - 4.53	-0.010 +0.0 +0.10 +0.1 3.17 +0.3 0.055 0.23	010 +0.00 10 +0.00 30 +0.30 29 0.335 50 +0.50	+0.010 +0.10 4.65 0.255 0.04	+0.010 +0.10 1.31 0.279 0.64	+0.010 +0 +0.10 +1 +0.30 0 0.278 0 0.50 +1	+0.010 + +0.10 + 0.36 + 0.167 0 +0.50 +	-0.010 +0.010 -0.10 +0.10 -0.30 +0.30 0.147 0.208 -0.50 0.51	0.011 =0.10 4.88 0.171 1.07	0.017 <0 <0.10 <0 4.91 <0 0.146 0. 1.70 0	0.10 +0.010 0.10 +0.10 0.30 1.55 1.240 0.000 0.51 0.87	0.018 -0.10 5.57 0.287 1.25	0.083 +0.10 33.9 0.95 5.14	0.011 +0.10 3.81 0.133 0.91		
ec (lotal) troonium (lotal)	pgt Calc ¹³⁴ 300 pgt NG 5	00 ²³ 30 NG N	2																				<0.	-3.0 0.30										*3.0 *0.30	59 03	9.5	<3.0 <3.0 <0.30 <0.3	.0 <3.0 30 <0.30	<0.30 <0.30	<0.0 <0.00	<0.30 ·	-0.30 ·	-3.0 -3.0 -0.30 -0.30	+3.0 +0.30	39 4 -030 4	-3.0 +3.0 0.30 +0.30	11.4 <0.30	0.5	<3.0 <0.30		ľ

Table A-1

Report

Page 1 of 1

APPENDIX C Certificates of Analysis



Sperling Hansen Associates Inc.

ATTN: Scott Garthwaite #8 - 1225 East Keith Road North Vancouver BC V7J 1J3 Date Received: 19-JAN-21

Report Date: 27-JAN-21 14:57 (MT)

Version: FINAL

Client Phone: 604-986-7723

Certificate of Analysis

Lab Work Order #: L2549508

Project P.O. #:

NOT SUBMITTED

Job Reference:

20050 FERNIE

C of C Numbers: Legal Site Desc:

Patryk Wojciak, B.Sc., P.Chem. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company



L2549508 CONTD.... PAGE 2 of 12

27-JAN-21 14:57 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-1 Surface Water 13-JAN-21 12:00 E257246	L2549508-2 Groundwater 14-JAN-21 12:00 E257244	L2549508-3 Surface Water 13-JAN-21 12:00 E257247	L2549508-4 Groundwater 14-JAN-21 12:00 E257237	L2549508-5 Groundwater 13-JAN-21 12:00 E257235
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 98.1	285	нтс 81.0	353	283
	Total Suspended Solids (mg/L)	2.3	97.2	4.9	13.7	1280
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	96.9	210	78.3	307	291
	Ammonia as N (mg/L)	<0.0050	0.0072	<0.0050	0.0113	0.426
	Bicarbonate (HCO3) (mg/L)	118	256	95.5	375	355
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	1.25	56.4	0.43	4.22	1.62
	Conductivity (EC) (uS/cm)	186	552	154	576	493
	Fluoride (F) (mg/L)	0.056	0.066	0.053	0.036	0.038
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	0.0484	0.0106	0.0552	1.90	0.0093
	Nitrate (as N) (mg/L)	0.0484	0.0106	0.0552	1.90	0.0093
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	pH (pH)	8.19	8.11	8.17	8.12	8.07
	Orthophosphate-Dissolved (as P) (mg/L)	0.0059	<0.0010	0.0038	0.0069	<0.0010
	Sulfate (SO4) (mg/L)	5.14	12.0	4.64	13.5	5.40
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	2.99	4.76	3.66	6.54	6.8
Total Metals	Aluminum (Al)-Total (mg/L)	0.232		0.354		
	Antimony (Sb)-Total (mg/L)	0.00011		0.00011		
	Arsenic (As)-Total (mg/L)	0.00020		0.00026		
	Barium (Ba)-Total (mg/L)	0.238		0.239		
	Beryllium (Be)-Total (mg/L)	<0.000020		<0.000020		
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.0000437		0.0000441		
	Calcium (Ca)-Total (mg/L)	29.0		23.2		
	Chromium (Cr)-Total (mg/L)	0.00025		0.00038		
	Cobalt (Co)-Total (mg/L)	<0.00010		<0.00010		
	Copper (Cu)-Total (mg/L)	0.00051		0.00064		
	Iron (Fe)-Total (mg/L)	0.142		0.264		
	Lead (Pb)-Total (mg/L)	0.000086		0.000152		
	Lithium (Li)-Total (mg/L)	0.0090		0.0102		
	Magnesium (Mg)-Total (mg/L)	6.22		5.59		
	Manganese (Mn)-Total (mg/L)	0.00348		0.00452		
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.0000050		
	Molybdenum (Mo)-Total (mg/L)	0.000434		0.000505		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2549508 CONTD.... PAGE 3 of 12 27-JAN-21 14:57 (MT)

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-6 Surface Water 13-JAN-21 12:00 E257250	L2549508-7 Groundwater 13-JAN-21 12:00 E257252	L2549508-8 Groundwater 13-JAN-21 12:00 E257239	L2549508-9 Surface Water 13-JAN-21 12:00 E257245	L2549508-10 Groundwater 13-JAN-21 12:00 E257242
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 81.2	63.3	173	нтс 60.0	341
	Total Suspended Solids (mg/L)	58.9	30.2	1800 DLHC	22.3	155
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	75.9	56.5	169	58.2	343
	Ammonia as N (mg/L)	0.0085	<0.0050	0.0126	<0.0050	0.0476
	Bicarbonate (HCO3) (mg/L)	92.6	68.9	206	71.0	418
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	0.54	0.34	0.43	0.20	1.98
	Conductivity (EC) (uS/cm)	142	113	303	109	570
	Fluoride (F) (mg/L)	0.041	0.041	0.048	0.040	0.036
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	0.0889	0.0364	0.111	0.0386	0.0110
	Nitrate (as N) (mg/L)	0.0873	0.0364	0.111	0.0386	0.0110
	Nitrite (as N) (mg/L)	0.0016	<0.0010	<0.0010	<0.0010	<0.0010
	pH (pH)	8.08	7.94	7.79	7.96	8.02
	Orthophosphate-Dissolved (as P) (mg/L)	0.0146	0.0086	0.0054	0.0185	<0.0010
	Sulfate (SO4) (mg/L)	2.45	3.50	4.32	2.37	3.59
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	11.1	8.13	15.8 DLM	9.18	3.20
Total Metals	Aluminum (Al)-Total (mg/L)	2.77	1.93		1.76	
	Antimony (Sb)-Total (mg/L)	0.00015	0.00012		0.00011	
	Arsenic (As)-Total (mg/L)	0.00102	0.00071		0.00064	
	Barium (Ba)-Total (mg/L)	0.161	0.0958		0.127	
	Beryllium (Be)-Total (mg/L)	0.000153	0.000104		0.000089	
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050		<0.000050	
	Boron (B)-Total (mg/L)	<0.010	<0.010		<0.010	
	Cadmium (Cd)-Total (mg/L)	0.000110	0.0000442		0.0000379	
	Calcium (Ca)-Total (mg/L)	25.6	20.3		19.7	
	Chromium (Cr)-Total (mg/L)	0.00216	0.00152		0.00143	
	Cobalt (Co)-Total (mg/L)	0.00060	0.00040		0.00034	
	Copper (Cu)-Total (mg/L)	0.00271	0.00194		0.00141	
	Iron (Fe)-Total (mg/L)	2.29	1.44		1.23	
	Lead (Pb)-Total (mg/L)	0.00137	0.000783		0.000644	
	Lithium (Li)-Total (mg/L)	0.0045	0.0027		0.0034	
	Magnesium (Mg)-Total (mg/L)	4.20	3.08		2.63	
	Manganese (Mn)-Total (mg/L)	0.0660	0.0236		0.0173	
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050		<0.0000050	
	Molybdenum (Mo)-Total (mg/L)	0.00116	0.000365		0.000348	

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2549508 CONTD.... PAGE 4 of 12 27-JAN-21 14:57 (MT)

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-11 Groundwater 13-JAN-21 12:00 E257236	L2549508-12 Groundwater 14-JAN-21 12:00 E257238		
Grouping	Analyte				
WATER					
Physical Tests	Hardness (as CaCO3) (mg/L)	260	268		
	Total Suspended Solids (mg/L)	37.0	95.9		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	259	271		
	Ammonia as N (mg/L)	0.291	0.127		
	Bicarbonate (HCO3) (mg/L)	316	331		
	Carbonate (CO3) (mg/L)	<5.0	<5.0		
	Chloride (CI) (mg/L)	1.64	2.61		
	Conductivity (EC) (uS/cm)	459	472		
	Fluoride (F) (mg/L)	0.034	0.037		
	Hydroxide (OH) (mg/L)	<5.0	<5.0		
	Nitrate and Nitrite (as N) (mg/L)	0.0067	0.0286		
	Nitrate (as N) (mg/L)	0.0067	0.0286		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010		
	pH (pH)	8.16	8.19		
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010		
	Sulfate (SO4) (mg/L)	5.41	8.14		
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	3.12	3.67		
Total Metals	Aluminum (Al)-Total (mg/L)				
	Antimony (Sb)-Total (mg/L)				
	Arsenic (As)-Total (mg/L)				
	Barium (Ba)-Total (mg/L)				
	Beryllium (Be)-Total (mg/L)				
	Bismuth (Bi)-Total (mg/L)				
	Boron (B)-Total (mg/L)				
	Cadmium (Cd)-Total (mg/L)				
	Calcium (Ca)-Total (mg/L)				
	Chromium (Cr)-Total (mg/L)				
	Cobalt (Co)-Total (mg/L)				
	Copper (Cu)-Total (mg/L)				
	Iron (Fe)-Total (mg/L)				
	Lead (Pb)-Total (mg/L)				
	Lithium (Li)-Total (mg/L)				
	Magnesium (Mg)-Total (mg/L)				
	Manganese (Mn)-Total (mg/L)				
	Mercury (Hg)-Total (mg/L)				
	Molybdenum (Mo)-Total (mg/L)				

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2549508 CONTD.... PAGE 5 of 12 27-JAN-21 14:57 (MT)

ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-1 Surface Water 13-JAN-21 12:00 E257246	L2549508-2 Groundwater 14-JAN-21 12:00 E257244	L2549508-3 Surface Water 13-JAN-21 12:00 E257247	L2549508-4 Groundwater 14-JAN-21 12:00 E257237	L2549508-5 Groundwater 13-JAN-21 12:00 E257235
Grouping	Analyte					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	<0.00050		0.00055		
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050		
	Potassium (K)-Total (mg/L)	0.56		0.62		
	Selenium (Se)-Total (mg/L)	0.000443		0.000425		
	Silicon (Si)-Total (mg/L)	2.22		2.41		
	Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		
	Sodium (Na)-Total (mg/L)	2.39		2.44		
	Strontium (Sr)-Total (mg/L)	0.0984		0.0883		
	Sulfur (S)-Total (mg/L)	2.18		2.04		
	Thallium (TI)-Total (mg/L)	<0.000010		0.000011		
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Total (mg/L)	0.00465		0.00488		
	Uranium (U)-Total (mg/L)	0.000256		0.000171		
	Vanadium (V)-Total (mg/L)	0.00084		0.00107		
	Zinc (Zn)-Total (mg/L)	<0.0030		<0.0030		
	Zirconium (Zr)-Total (mg/L)	<0.00030		<0.00030		
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0011		0.0024	<0.0010
	Antimony (Sb)-Dissolved (mg/L)		0.00011		0.00023	<0.00010
	Arsenic (As)-Dissolved (mg/L)		<0.00010		0.00019	0.00408
	Barium (Ba)-Dissolved (mg/L)		0.141		0.238	0.776
	Beryllium (Be)-Dissolved (mg/L)		<0.000020		<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050		<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)		0.026		0.083	0.033
	Cadmium (Cd)-Dissolved (mg/L)		0.0000596		0.000282	0.0000381
	Calcium (Ca)-Dissolved (mg/L)		81.0		116	92.1
	Chromium (Cr)-Dissolved (mg/L)		<0.00010		0.00013	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		<0.00010		0.00020	0.00274
	Copper (Cu)-Dissolved (mg/L)		0.00046		0.00181	0.00024
	Iron (Fe)-Dissolved (mg/L)		<0.010		<0.010	2.59
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.0138		0.0039	0.0062
	Magnesium (Mg)-Dissolved (mg/L)		20.0		15.5	12.8
	Manganese (Mn)-Dissolved (mg/L)		0.00039		0.0610	2.68
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050		<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)		0.000389		0.000140	0.00102

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2549508 CONTD.... PAGE 6 of 12

27-JAN-21 14:57 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-6 Surface Water 13-JAN-21 12:00 E257250	L2549508-7 Groundwater 13-JAN-21 12:00 E257252	L2549508-8 Groundwater 13-JAN-21 12:00 E257239	L2549508-9 Surface Water 13-JAN-21 12:00 E257245	L2549508-10 Groundwater 13-JAN-21 12:00 E257242
Grouping	Analyte					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.00283	0.00167		0.00139	
	Phosphorus (P)-Total (mg/L)	0.143	0.084		0.071	
	Potassium (K)-Total (mg/L)	1.33	1.15		0.96	
	Selenium (Se)-Total (mg/L)	0.000198	0.000146		0.000159	
	Silicon (Si)-Total (mg/L)	7.07	5.20		4.84	
	Silver (Ag)-Total (mg/L)	0.000038	0.000018		0.000025	
	Sodium (Na)-Total (mg/L)	1.31	0.853		1.36	
	Strontium (Sr)-Total (mg/L)	0.0999	0.0689		0.101	
	Sulfur (S)-Total (mg/L)	1.22	1.47		1.18	
	Thallium (TI)-Total (mg/L)	0.000083	0.000046		0.000037	
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010		<0.00010	
	Titanium (Ti)-Total (mg/L)	0.0339	0.0264		0.0225	
	Uranium (U)-Total (mg/L)	0.000160	0.000152		0.000105	
	Vanadium (V)-Total (mg/L)	0.00514	0.00321		0.00326	
	Zinc (Zn)-Total (mg/L)	0.0148	0.0069		0.0059	
	Zirconium (Zr)-Total (mg/L)	0.00050	0.00052		0.00030	
Dissolved Metals	Dissolved Mercury Filtration Location			FIELD		FIELD
	Dissolved Metals Filtration Location			FIELD		FIELD
	Aluminum (AI)-Dissolved (mg/L)			0.0024		0.0024
	Antimony (Sb)-Dissolved (mg/L)			0.00023		0.00014
	Arsenic (As)-Dissolved (mg/L)			0.00014		0.00064
	Barium (Ba)-Dissolved (mg/L)			0.190		0.592
	Beryllium (Be)-Dissolved (mg/L)			<0.000020		<0.000020
	Bismuth (Bi)-Dissolved (mg/L)			<0.000050		<0.000050
	Boron (B)-Dissolved (mg/L)			0.012		0.043
	Cadmium (Cd)-Dissolved (mg/L)			0.0000213		0.00119
	Calcium (Ca)-Dissolved (mg/L)			57.6		113
	Chromium (Cr)-Dissolved (mg/L)			<0.00010		<0.00010
	Cobalt (Co)-Dissolved (mg/L)			<0.00010		0.00446
	Copper (Cu)-Dissolved (mg/L)			0.00284		0.00056
	Iron (Fe)-Dissolved (mg/L)			<0.010		0.304
	Lead (Pb)-Dissolved (mg/L)			<0.000050		<0.000050
	Lithium (Li)-Dissolved (mg/L)			0.0071		0.0058
	Magnesium (Mg)-Dissolved (mg/L)			7.11		14.3
	Manganese (Mn)-Dissolved (mg/L)			0.00086		1.78
	Mercury (Hg)-Dissolved (mg/L)			<0.0000050		<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)			0.000534		0.000468

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-11 Groundwater 13-JAN-21 12:00 E257236	L2549508-12 Groundwater 14-JAN-21 12:00 E257238		
Grouping	Analyte				
WATER					
Total Metals	Nickel (Ni)-Total (mg/L)				
	Phosphorus (P)-Total (mg/L)				
	Potassium (K)-Total (mg/L)				
	Selenium (Se)-Total (mg/L)				
	Silicon (Si)-Total (mg/L)				
	Silver (Ag)-Total (mg/L)				
	Sodium (Na)-Total (mg/L)				
	Strontium (Sr)-Total (mg/L)				
	Sulfur (S)-Total (mg/L)				
	Thallium (TI)-Total (mg/L)				
	Tin (Sn)-Total (mg/L)				
	Titanium (Ti)-Total (mg/L)				
	Uranium (U)-Total (mg/L)				
	Vanadium (V)-Total (mg/L)				
	Zinc (Zn)-Total (mg/L)				
	Zirconium (Zr)-Total (mg/L)				
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		
	Dissolved Metals Filtration Location	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0029	0.0018		
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010		
	Arsenic (As)-Dissolved (mg/L)	0.00333	0.00017		
	Barium (Ba)-Dissolved (mg/L)	0.667	0.484		
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)	0.028	0.022		
	Cadmium (Cd)-Dissolved (mg/L)	0.000136	0.0000557		
	Calcium (Ca)-Dissolved (mg/L)	84.1	83.4		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	0.00239	0.00038		
	Copper (Cu)-Dissolved (mg/L)	0.00061	0.00086		
	Iron (Fe)-Dissolved (mg/L)	2.00	0.061		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.0072	0.0062		
	Magnesium (Mg)-Dissolved (mg/L)	12.0	14.5		
	Manganese (Mn)-Dissolved (mg/L)	2.11	1.33		
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.0000050		
	Molybdenum (Mo)-Dissolved (mg/L)	0.00100	0.000843		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-1 Surface Water 13-JAN-21 12:00 E257246	L2549508-2 Groundwater 14-JAN-21 12:00 E257244	L2549508-3 Surface Water 13-JAN-21 12:00 E257247	L2549508-4 Groundwater 14-JAN-21 12:00 E257237	L2549508-5 Groundwater 13-JAN-21 12:00 E257235
Grouping	Analyte					
WATER	•					
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)		<0.00050		0.00102	0.00413
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		0.73		6.58	1.89
	Selenium (Se)-Dissolved (mg/L)		0.000507		0.000403	<0.000050
	Silicon (Si)-Dissolved (mg/L)		3.31		4.17	4.71
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)		5.07		5.65	4.22
	Strontium (Sr)-Dissolved (mg/L)		0.427		0.369	0.284
	Sulfur (S)-Dissolved (mg/L)		4.53		5.15	2.12
	Thallium (TI)-Dissolved (mg/L)		<0.000010		0.000024	0.000085
	Tin (Sn)-Dissolved (mg/L)		<0.00010		0.00014	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.000285		0.00105	0.000492
	Vanadium (V)-Dissolved (mg/L)		<0.00050		<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		0.0018		0.0047	0.0043
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
Aggregate	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Organics	Chemical Oxygen Demand (mg/L)	<10	11	<10	24	56

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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ALS ENVIRONMENTAL ANALYTICAL REPORT

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	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-6 Surface Water 13-JAN-21 12:00 E257250	L2549508-7 Groundwater 13-JAN-21 12:00 E257252	L2549508-8 Groundwater 13-JAN-21 12:00 E257239	L2549508-9 Surface Water 13-JAN-21 12:00 E257245	L2549508-10 Groundwater 13-JAN-21 12:00 E257242
Grouping	Analyte					
WATER						
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)			<0.00050		0.00887
	Phosphorus (P)-Dissolved (mg/L)			<0.050		<0.050
	Potassium (K)-Dissolved (mg/L)			0.69		1.62
	Selenium (Se)-Dissolved (mg/L)			0.000520		0.000062
	Silicon (Si)-Dissolved (mg/L)			3.57		4.21
	Silver (Ag)-Dissolved (mg/L)			<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)			3.45		3.06
	Strontium (Sr)-Dissolved (mg/L)			0.358		0.373
	Sulfur (S)-Dissolved (mg/L)			1.52		1.48
	Thallium (TI)-Dissolved (mg/L)			<0.000010		0.000065
	Tin (Sn)-Dissolved (mg/L)			<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)			<0.00030		<0.00030
	Uranium (U)-Dissolved (mg/L)			0.000308		0.00106
	Vanadium (V)-Dissolved (mg/L)			<0.00050		<0.00050
	Zinc (Zn)-Dissolved (mg/L)			0.0014		0.0093
	Zirconium (Zr)-Dissolved (mg/L)			<0.00030		<0.00030
Aggregate	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
Organics	Chemical Oxygen Demand (mg/L)	26	21	150	19	22

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2549508-11 Groundwater 13-JAN-21 12:00 E257236	L2549508-12 Groundwater 14-JAN-21 12:00 E257238		
Grouping	Analyte				
WATER					
Dissolved Metals	Nickel (Ni)-Dissolved (mg/L)	0.00471	0.00280		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	1.59	1.32		
	Selenium (Se)-Dissolved (mg/L)	<0.000050	<0.000050		
	Silicon (Si)-Dissolved (mg/L)	4.27	4.04		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.00010		
	Sodium (Na)-Dissolved (mg/L)	3.88	4.11		
	Strontium (Sr)-Dissolved (mg/L)	0.268	0.247		
	Sulfur (S)-Dissolved (mg/L)	1.99	2.94		
	Thallium (TI)-Dissolved (mg/L)	0.000092	0.000039		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030		
	Uranium (U)-Dissolved (mg/L)	0.000510	0.000669		
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050		
	Zinc (Zn)-Dissolved (mg/L)	0.0033	0.0064		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030		
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0		
	Chemical Oxygen Demand (mg/L)	<10	<10		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version: FINAL

Qualifiers for Sample Submission Listed:

Qualifier Description **EHR** Exceeded Recommended Holding Time prior to receipt at the lab. - BOD, NO3/NO2, PO4 went past hold time prior to receipt at QC Samples with Qualifiers & Comments: QC Type Description Applies to Sample Number(s) Parameter Qualifier **Qualifiers for Individual Parameters Listed:** Qualifier Description DLHC Detection Limit Raised: Dilution required due to high concentration of test analyte(s). DLM Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Test Method References:

HTC

ALS Test Code	Matrix	Test Description	Method Reference**	
BE-D-L-CCMS-CL	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)	

Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-CL Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-L-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry

Samples are analyzed using the closed reflux colourimetric method

F-L-IC-CL Water Fluoride APHA 4110 B-Ion Chromatography

HARDNESS-CALC-CL Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents.

Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-CL Water Dissolved Mercury in Water by CVAAS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

HG-T-CVAA-CL Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

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Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-CL Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH/EC/ALK-CL Water pH, Conductivity and Total Alkalinity APHA 4500H,2510,2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.

Alkalinity measurement is based on the sample's capacity to neutralize acid

Conductivity measurement is based on the sample's capacity to convey an electric current

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-L-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TSS-L-CL Water Total Suspended Solids APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour 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.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L2549508 Report Date: 27-JAN-21 Page 1 of 15

Client: Sperling Hansen Associates Inc.

#8 - 1225 East Keith Road North Vancouver BC V7J 1J3

Contact: Scott Garthwaite

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BE-D-L-CCMS-CL	Water							
Batch R5357483								
WG3478433-2 LCS Beryllium (Be)-Dissolved	i	TMRM	95.0		%		80-120	25-JAN-21
WG3478433-6 LCS Beryllium (Be)-Dissolved	Í	TMRM	105.2		%		80-120	25-JAN-21
WG3478433-1 MB Beryllium (Be)-Dissolved	i		<0.000020)	mg/L		0.00002	25-JAN-21
Beryllium (Be)-Dissolved	i		<0.000020)	mg/L		0.00002	25-JAN-21
WG3478433-5 MB Beryllium (Be)-Dissolved	i		<0.000020)	mg/L		0.00002	25-JAN-21
BE-T-L-CCMS-CL	Water							
Batch R5356216								
WG3476527-2 LCS Beryllium (Be)-Total		TMRM	100.2		%		80-120	21-JAN-21
WG3476527-1 MB Beryllium (Be)-Total			<0.000020)	mg/L		0.00002	21-JAN-21
BOD-BC-CL	Water							
Batch R5357178								
WG3477949-2 LCS Biochemical Oxygen De	mand		92.6		%		85-115	19-JAN-21
WG3477949-5 LCS Biochemical Oxygen De	mand		97.9		%		85-115	19-JAN-21
WG3477949-1 MB Biochemical Oxygen De	mand		<2.0		mg/L		2	19-JAN-21
WG3477949-4 MB Biochemical Oxygen De	mand		<2.0		mg/L		2	19-JAN-21
C-TOT-ORG-LOW-CL	Water							
Batch R5358143								
WG3479119-2 LCS Total Organic Carbon			108.6		%		80-120	26-JAN-21
WG3479119-1 MB Total Organic Carbon			<0.50		mg/L		0.5	26-JAN-21
CL-L-IC-N-CL	Water							
Batch R5356914								
WG3477689-7 DUP Chloride (Cl)		L2549508-7 0.34	0.35		mg/L	2.9	20	19-JAN-21
WG3477689-2 LCS Chloride (CI)			105.8		%		85-115	19-JAN-21
WG3477689-6								



Workorder: L2549508

Report Date: 27-JAN-21 Page 2 of 15

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-CL	Water							
Batch R5	356914							
WG3477689-6 Chloride (Cl)	LCS		104.6		%		85-115	19-JAN-21
WG3477689-1 Chloride (Cl)	МВ		<0.10		mg/L		0.1	19-JAN-21
WG3477689-5 Chloride (CI)	MB		<0.10		mg/L		0.1	19-JAN-21
WG3477689-8 Chloride (Cl)	MS	L2549508-7	118.4		%		75-125	19-JAN-21
COD-T-COL-CL	Water							
Batch R5	355831							
WG3476463-2 Chemical Oxyge			98.8		%		85-115	20-JAN-21
WG3476463-1 Chemical Oxyge	MB en Demand		<10		mg/L		10	20-JAN-21
F-L-IC-CL	Water							
Batch R5	356914							
WG3477689-7 Fluoride (F)	DUP	L2549508-7 0.041	0.039		mg/L	6.8	20	19-JAN-21
WG3477689-2 Fluoride (F)	LCS		104.9		%		85-115	19-JAN-21
WG3477689-6 Fluoride (F)	LCS		103.4		%		85-115	19-JAN-21
WG3477689-1 Fluoride (F)	МВ		<0.020		mg/L		0.02	19-JAN-21
WG3477689-5 Fluoride (F)	МВ		<0.020		mg/L		0.02	19-JAN-21
WG3477689-8 Fluoride (F)	MS	L2549508-7	114.4		%		75-125	19-JAN-21
HG-D-CVAA-CL	Water							
Batch R5	356211							
WG3476786-2 Mercury (Hg)-Di	LCS		100.0		%		80-120	21-JAN-21
WG3476786-6 Mercury (Hg)-Di			103.0		%		80-120	21-JAN-21
WG3476786-1 Mercury (Hg)-Di	MB issolved		<0.000005	С	mg/L		0.000005	21-JAN-21
WG3476786-5	MB issolved							



Workorder: L2549508 Report Date: 27-JAN-21 Page 3 of 15

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-CVAA-CL	Water							
Batch R5358111 WG3479000-3 DUP Mercury (Hg)-Dissolved		L2549508-12 <0.0000050	<0.000005	C RPD-NA	mg/L	N/A	20	26-JAN-21
WG3479000-2 LCS Mercury (Hg)-Dissolved			102.0		%		80-120	26-JAN-21
WG3479000-1 MB Mercury (Hg)-Dissolved			<0.000005	GC .	mg/L		0.000005	26-JAN-21
WG3479000-4 MS Mercury (Hg)-Dissolved		L2549508-12	92.4		%		70-130	26-JAN-21
HG-T-CVAA-CL	Water							
Batch R5356211 WG3476783-2 LCS								
Mercury (Hg)-Total			96.3		%		80-120	21-JAN-21
WG3476783-1 MB Mercury (Hg)-Total			<0.000005	GC .	mg/L		0.000005	21-JAN-21
MET-D-CCMS-CL	Water							
Batch R5357483								
WG3478433-2 LCS Aluminum (Al)-Dissolved	1	TMRM	102.1		%		80-120	25-JAN-21
Antimony (Sb)-Dissolved			102.1		%		80-120	25-JAN-21 25-JAN-21
Arsenic (As)-Dissolved	•		104.0		%		80-120	25-JAN-21
Barium (Ba)-Dissolved			106.1		%		80-120	25-JAN-21
Bismuth (Bi)-Dissolved			104.4		%		80-120	25-JAN-21
Boron (B)-Dissolved			101.6		%		80-120	25-JAN-21
Cadmium (Cd)-Dissolve	d		103.0		%		80-120	25-JAN-21
Calcium (Ca)-Dissolved			102.5		%		80-120	25-JAN-21
Chromium (Cr)-Dissolve	d		103.4		%		80-120	25-JAN-21
Cobalt (Co)-Dissolved			102.5		%		80-120	25-JAN-21
Copper (Cu)-Dissolved			103.5		%		80-120	25-JAN-21
Iron (Fe)-Dissolved			98.2		%		80-120	25-JAN-21
Lead (Pb)-Dissolved			104.3		%		80-120	25-JAN-21
Lithium (Li)-Dissolved			101.8		%		80-120	25-JAN-21
Magnesium (Mg)-Dissolv	ved		111.8		%		80-120	25-JAN-21
Manganese (Mn)-Dissol	ved		106.7		%		80-120	25-JAN-21
Molybdenum (Mo)-Disso	olved		103.5		%		80-120	25-JAN-21
Nickel (Ni)-Dissolved			100.6		%		80-120	25-JAN-21
Phosphorus (P)-Dissolve	ed		103.0		%		70-130	25-JAN-21



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MET-D-CCMS-CL Water	Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Potassium (K)-Dissolved	MET-D-CCMS-CL	Water							
Potassium (K)-Dissolved	Batch R5357483	3							
Selenium (Se)-Dissolved 99.4 % 60-140 25-JAN-21 Silicon (Si)-Dissolved 108.2 % 60-140 25-JAN-21 Silver (Ag)-Dissolved 108.8 80-120 25-JAN-21 Sodium (Na)-Dissolved 108.8 % 80-120 25-JAN-21 Strontium (Sr)-Dissolved 101.8 % 80-120 25-JAN-21 Sulfur (S)-Dissolved 108.5 % 80-120 25-JAN-21 Thillium (Ti)-Dissolved 108.8 % 80-120 25-JAN-21 Tim (Sr)-Dissolved 106.6 % 80-120 25-JAN-21 Tiranium (U)-Dissolved 99.98 % 80-120 25-JAN-21 Urandium (V)-Dissolved 97.2 % 80-120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zr)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zr)-Dissolved 102.7 % 80-120 25-JAN-21 Auranium (Al)-Dissolved 102.7 %		1	TMRM	440.0		0/			
Silicon (Si)-Dissolved 108.2 % 60.140 25-JAN-21 Silver (Ag)-Dissolved 100.9 % 80.120 25-JAN-21 Sodium (Na)-Dissolved 100.8 % 80.120 25-JAN-21 Sodium (Na)-Dissolved 108.8 % 80.120 25-JAN-21 Surfur (S)-Dissolved 101.8 % 80.120 25-JAN-21 Surfur (S)-Dissolved 108.8 % 80.120 25-JAN-21 Thallium (Ti)-Dissolved 108.8 % 80.120 25-JAN-21 Tim (Sn)-Dissolved 106.6 % 80.120 25-JAN-21 Tim (Sn)-Dissolved 106.6 % 80.120 25-JAN-21 Tim (Cn)-Dissolved 99.98 % 80.120 25-JAN-21 Uranium (U)-Dissolved 99.98 % 80.120 25-JAN-21 Vanadium (V)-Dissolved 97.2 % 80.120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 102.7 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 93.5 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 102.7 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 102.7 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 103.1 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 103.1 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 107.9 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 105.3 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 105.8 % 80.120 25-JAN-21 Zirco (Zn)-Dissolved 105.8 % 80.120 25-JAN-21 Circo (Zn)-Dissolved 105.8 % 80.120 25-JAN-21 Circo (Zn)-Dissolved 105.8 % 80.120 25-JAN-21 Linium (Li)-Dissolved 105.8 % 80.120 25-JAN-21 Linium (
Silver (Ag)-Dissolved	` ,	ed							
Sodium (Na)-Dissolved									
Strontium (Sr)-Dissolved	, ,,								
Sulfur (S)-Dissolved 108.5 % 80-120 25-JAN-21 Thallium (TI)-Dissolved 108.8 % 80-120 25-JAN-21 Tin (Sn)-Dissolved 106.6 % 80-120 25-JAN-21 Titanium (Ti)-Dissolved 99.98 % 80-120 25-JAN-21 Uranium (U)-Dissolved 97.2 % 80-120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zn)-Dissolved 102.7 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 105.3 % 80-120 25-JAN-21 Barium (Bi)-Dissolved 105.3 % 80-120 25-JAN-21 Barium (Bi)-Dissolved 105.3	, ,								
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Tin (Sn)-Dissolved 106.6 % 80-120 25-JAN-21 Titanium (Ti)-Dissolved 99.98 % 80-120 25-JAN-21 Uranium (U)-Dissolved 97.2 % 80-120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zn)-Dissolved 105.3 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS TMRM Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 105.3 % 80-120 25-JAN-21 Barlum (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 100.4 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 100.4 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 105.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 105.8 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 105.8 % 80-120 25-JAN-21	` '							80-120	
Titanium (Ti)-Dissolved 99.98 % 80-120 25-JAN-21 Uranium (U)-Dissolved 97.2 % 80-120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zn)-Dissolved 102.7 % 80-120 25-JAN-21 Zirconium (Zn)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS TMRM Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Birmuth (Bi)-Dissolved 105.3 % 80-120 25-JAN-21 Boron (B)-Dissolved 109.9 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 100.4 % 80-120 25-JAN-21 <	Thallium (TI)-Dissolved	i						80-120	25-JAN-21
Uranium (U)-Dissolved 97.2 % 80-120 25-JAN-21 Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zn)-Dissolved 102.7 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS TMRM Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 101.7 % 80-120 25-JAN-21 Cadium (Cd)-Dissolved 104.6 % 80-120 25-JAN-21 Cadium (Cd)-Dissolved 101.8 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 <td< td=""><td>` ,</td><td></td><td></td><td></td><td></td><td></td><td></td><td>80-120</td><td>25-JAN-21</td></td<>	` ,							80-120	25-JAN-21
Vanadium (V)-Dissolved 105.3 % 80-120 25-JAN-21 Zinc (Zn)-Dissolved 102.7 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS TMRM No.120 25-JAN-21 Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chormium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8	Titanium (Ti)-Dissolved	d		99.98				80-120	25-JAN-21
Zinc (Zn)-Dissolved 102.7 % 80-120 25-JAN-21 Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS TMRM Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Born (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 99.5 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.6 % 80-120 <td< td=""><td>Uranium (U)-Dissolved</td><td></td><td></td><td>97.2</td><td></td><td></td><td></td><td>80-120</td><td>25-JAN-21</td></td<>	Uranium (U)-Dissolved			97.2				80-120	25-JAN-21
Zirconium (Zr)-Dissolved 93.5 % 80-120 25-JAN-21 WG3478433-6 LCS Aluminum (Al)-Dissolved TMRM 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chomium (Cf)-Dissolved 101.8 % 80-120 25-JAN-21 Copat (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lead (Pb)-Dissolved	Vanadium (V)-Dissolve	ed		105.3		%		80-120	25-JAN-21
WG3478433-6 LCS TMRM Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 101.0 % 80-120 25-JAN-21 <td>Zinc (Zn)-Dissolved</td> <td></td> <td></td> <td>102.7</td> <td></td> <td>%</td> <td></td> <td>80-120</td> <td>25-JAN-21</td>	Zinc (Zn)-Dissolved			102.7		%		80-120	25-JAN-21
Aluminum (Al)-Dissolved 101.0 % 80-120 25-JAN-21 Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved <t< td=""><td>Zirconium (Zr)-Dissolve</td><td>ed</td><td></td><td>93.5</td><td></td><td>%</td><td></td><td>80-120</td><td>25-JAN-21</td></t<>	Zirconium (Zr)-Dissolve	ed		93.5		%		80-120	25-JAN-21
Antimony (Sb)-Dissolved 107.9 % 80-120 25-JAN-21 Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Birmuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Lopper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 110.6 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.8 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21			TMRM			0/			
Arsenic (As)-Dissolved 103.1 % 80-120 25-JAN-21 Barium (Ba)-Dissolved 105.3 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Bismuth (Bi)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Long (Fe)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 101.8 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 104.6 % 80-120 25-JAN-21	` ,								
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Bismuth (Bi)-Dissolved 109.9 % 80-120 25-JAN-21 Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 101.8 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	` ,							80-120	25-JAN-21
Boron (B)-Dissolved 115.7 % 80-120 25-JAN-21 Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	` '							80-120	25-JAN-21
Cadmium (Cd)-Dissolved 94.6 % 80-120 25-JAN-21 Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21				109.9				80-120	25-JAN-21
Calcium (Ca)-Dissolved 100.4 % 80-120 25-JAN-21 Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Boron (B)-Dissolved			115.7		%		80-120	25-JAN-21
Chromium (Cr)-Dissolved 101.8 % 80-120 25-JAN-21 Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Cadmium (Cd)-Dissolv	red		94.6		%		80-120	25-JAN-21
Cobalt (Co)-Dissolved 102.2 % 80-120 25-JAN-21 Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	, ,			100.4		%		80-120	25-JAN-21
Copper (Cu)-Dissolved 101.8 % 80-120 25-JAN-21 Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Chromium (Cr)-Dissolv	red .		101.8		%		80-120	25-JAN-21
Iron (Fe)-Dissolved 89.6 % 80-120 25-JAN-21 Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Cobalt (Co)-Dissolved			102.2		%		80-120	25-JAN-21
Lead (Pb)-Dissolved 110.0 % 80-120 25-JAN-21 Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Copper (Cu)-Dissolved	l		101.8		%		80-120	25-JAN-21
Lithium (Li)-Dissolved 99.5 % 80-120 25-JAN-21 Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Iron (Fe)-Dissolved			89.6		%		80-120	25-JAN-21
Magnesium (Mg)-Dissolved 110.6 % 80-120 25-JAN-21 Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Lead (Pb)-Dissolved			110.0		%		80-120	25-JAN-21
Manganese (Mn)-Dissolved 105.8 % 80-120 25-JAN-21 Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Lithium (Li)-Dissolved			99.5		%		80-120	25-JAN-21
Molybdenum (Mo)-Dissolved 101.8 % 80-120 25-JAN-21 Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Magnesium (Mg)-Disso	olved		110.6		%		80-120	25-JAN-21
Nickel (Ni)-Dissolved 104.6 % 80-120 25-JAN-21	Manganese (Mn)-Disso	olved		105.8		%		80-120	25-JAN-21
	Molybdenum (Mo)-Diss	solved		101.8		%		80-120	25-JAN-21
Phosphorus (P)-Dissolved 99.6 % 70-130 25-JAN-21	Nickel (Ni)-Dissolved			104.6		%		80-120	25-JAN-21
	Phosphorus (P)-Dissol	ved		99.6		%		70-130	25-JAN-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R5357483								
WG3478433-6 LCS		TMRM	100.1		0/			
Potassium (K)-Dissolved			103.4 98.1		%		80-120	25-JAN-21
Selenium (Se)-Dissolved Silicon (Si)-Dissolved			108.1		%		80-120	25-JAN-21
Silver (Ag)-Dissolved			106.1				60-140	25-JAN-21
ν ο,			101.6		%		80-120	25-JAN-21
Sodium (Na)-Dissolved					%		80-120	25-JAN-21
Strontium (Sr)-Dissolved			114.8		%		80-120	25-JAN-21
Sulfur (S)-Dissolved			86.5		%		80-120	25-JAN-21
Thallium (TI)-Dissolved			106.3		%		80-120	25-JAN-21
Tin (Sn)-Dissolved			105.7		%		80-120	25-JAN-21
Titanium (Ti)-Dissolved			105.7		%		80-120	25-JAN-21
Uranium (U)-Dissolved			104.6		%		80-120	25-JAN-21
Vanadium (V)-Dissolved			102.2		%		80-120	25-JAN-21
Zinc (Zn)-Dissolved			101.5		%		80-120	25-JAN-21
Zirconium (Zr)-Dissolved			94.3		%		80-120	25-JAN-21
WG3478433-1 MB			-0.0010		ma/l		0.004	05 1411 04
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	25-JAN-21
Aluminum (Al)-Dissolved					mg/L		0.001	25-JAN-21
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Bismuth (Bi)-Dissolved			<0.00005		mg/L		0.00005	25-JAN-21
Bismuth (Bi)-Dissolved			<0.00005	0	mg/L		0.00005	25-JAN-21
Boron (B)-Dissolved			<0.010		mg/L		0.01	25-JAN-21
Boron (B)-Dissolved			<0.010		mg/L		0.01	25-JAN-21
Cadmium (Cd)-Dissolved			<0.00000		mg/L		0.000005	25-JAN-21
Cadmium (Cd)-Dissolved			<0.00000	50	mg/L		0.000005	25-JAN-21
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	25-JAN-21
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	25-JAN-21
Chromium (Cr)-Dissolved			<0.00010	1	mg/L		0.0001	25-JAN-21
Chromium (Cr)-Dissolved			<0.00010	1	mg/L		0.0001	25-JAN-21
Cobalt (Co)-Dissolved			<0.00010	1	mg/L		0.0001	25-JAN-21



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Test Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL Water							
Batch R5357483							
WG3478433-1 MB		0.00040					
Cobalt (Co)-Dissolved		<0.00010		mg/L		0.0001	25-JAN-21
Copper (Cu)-Dissolved		<0.00020		mg/L		0.0002	25-JAN-21
Copper (Cu)-Dissolved		<0.00020		mg/L		0.0002	25-JAN-21
Iron (Fe)-Dissolved		<0.010		mg/L		0.01	25-JAN-21
Iron (Fe)-Dissolved		<0.010		mg/L		0.01	25-JAN-21
Lead (Pb)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Lead (Pb)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Lithium (Li)-Dissolved		<0.0010		mg/L		0.001	25-JAN-21
Lithium (Li)-Dissolved		<0.0010		mg/L		0.001	25-JAN-21
Magnesium (Mg)-Dissolved		<0.0050		mg/L		0.005	25-JAN-21
Magnesium (Mg)-Dissolved		<0.0050		mg/L		0.005	25-JAN-21
Manganese (Mn)-Dissolved		<0.00010		mg/L		0.0001	25-JAN-21
Manganese (Mn)-Dissolved		<0.00010		mg/L		0.0001	25-JAN-21
Molybdenum (Mo)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Molybdenum (Mo)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Nickel (Ni)-Dissolved		<0.00050		mg/L		0.0005	25-JAN-21
Nickel (Ni)-Dissolved		<0.00050		mg/L		0.0005	25-JAN-21
Phosphorus (P)-Dissolved		<0.050		mg/L		0.05	25-JAN-21
Phosphorus (P)-Dissolved		< 0.050		mg/L		0.05	25-JAN-21
Potassium (K)-Dissolved		< 0.050		mg/L		0.05	25-JAN-21
Potassium (K)-Dissolved		< 0.050		mg/L		0.05	25-JAN-21
Selenium (Se)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Selenium (Se)-Dissolved		<0.000050		mg/L		0.00005	25-JAN-21
Silicon (Si)-Dissolved		< 0.050		mg/L		0.05	25-JAN-21
Silicon (Si)-Dissolved		< 0.050		mg/L		0.05	25-JAN-21
Silver (Ag)-Dissolved		<0.000010		mg/L		0.00001	25-JAN-21
Silver (Ag)-Dissolved		<0.000010		mg/L		0.00001	25-JAN-21
Sodium (Na)-Dissolved		<0.050		mg/L		0.05	25-JAN-21
Sodium (Na)-Dissolved		<0.050		mg/L		0.05	25-JAN-21
Strontium (Sr)-Dissolved		<0.00020		mg/L		0.0002	25-JAN-21
Strontium (Sr)-Dissolved		<0.00020		mg/L		0.0002	25-JAN-21
Sulfur (S)-Dissolved		<0.50		mg/L		0.5	25-JAN-21
Sulfur (S)-Dissolved		<0.50		mg/L		0.5	25-JAN-21
Thallium (TI)-Dissolved		<0.000010		mg/L		0.00001	25-JAN-21



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Metro-DCMS-CL Water Batch R5357438 WG4374334-1 MB Theilium (Ti)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Tin (Sin)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Tin (Sin)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Tin (Sin)-Dissolved <0.00030 mg/L 0.0001 25-JAN-21 Tinanium (Ti)-Dissolved <0.00030 mg/L 0.0003 25-JAN-21 Tinanium (Ti)-Dissolved <0.00030 mg/L 0.0003 25-JAN-21 Tinanium (Ti)-Dissolved <0.00030 mg/L 0.0003 25-JAN-21 Uranium (U)-Dissolved <0.000010 mg/L 0.0003 25-JAN-21 Uranium (U)-Dissolved <0.000010 mg/L 0.00001 25-JAN-21 Uranium (U)-Dissolved <0.000010 mg/L 0.00005 25-JAN-21 Uranium (U)-Dissolved <0.000000 mg/L 0.00005 25-JAN-21 Uranium (U)-Dissolved <0.000000 mg/L 0.00005 25-JAN-21 Uranium (U)-Dissolved <0.000000 mg/L 0.0000 25-JAN-21 Uranium (U)-Dissolved <0.00000 mg/L 0.0000 25-JAN-21 Uranium (U)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Uranium (U)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Uranium (U)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Uranium (U)-Dissolved <0.00000 mg/L 0.0000 25-JAN-21 Uranium (U)-Dissolved <0.000000 mg/L 0.0000 25-JAN-21 Uranium (U)-Dissolved <0.000000 mg/L 0.0001 25-JAN-21 Uranium (U)-Dissolved <0.00010 mg/L 0.0000 25-JAN-21 Uranium (U)-Dissolved	Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
WO3478433-1 MB Thalium (TI)-Dissolved	MET-D-CCMS-CL	Water							
Thallium (TI)-Dissolved	Batch R5357483	3							
Tin (Sn)-Dissolved		J		0.000040		A			
Tin (Sn)-Dissolved	` '	ı				-			
Titanium (Ti)-Dissolved <0.00030	, ,								
Titanium (Ti)-Dissolved		J				-			
Uranium (U)-Dissolved	()					-			
Uranium (U)-Dissolved	` ,					-			
Vanadium (V)-Dissolved <0.00050	()					-			
Vanadium (V)-Dissolved <0.00050	, ,					_			
Zinc (Zn)-Dissolved <0.0010	. ,					-			
Zinc (Zn)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Zirconium (Zr)-Dissolved <0.00020	` '	ea							
Zirconium (Zr)-Dissolved <0.00020 mg/L 0.0002 25-JAN-21 Zirconium (Zr)-Dissolved <0.00020	• •					-			
Zirconium (Zr)-Dissolved <0.00020 mg/L 0.0002 25-JAN-21 WG3478433-5 MB MB Aluminum (Al)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Antimony (Sb)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Arsenic (As)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Barium (Ba)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Bismuth (Bi)-Dissolved <0.000050 mg/L 0.00005 25-JAN-21 Boron (B)-Dissolved <0.0010 mg/L 0.00005 25-JAN-21 Cadmium (Cd)-Dissolved <0.000050 mg/L 0.000005 25-JAN-21 Calcium (Ca)-Dissolved <0.0050 mg/L 0.005 25-JAN-21 Chromium (Cr)-Dissolved <0.0050 mg/L 0.0001 25-JAN-21 Cobalt (Ca)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Copper (Cu)-Dissolved <0.00010 mg/L 0.0002 25-JAN-21 Lead (Pb)-Dissolved <0.00005	` ,					-			
WG3478433-5 MB Aluminum (Al)-Dissolved <0.0010 mg/L 0.001 25-JAN-21 Antimony (Sb)-Dissolved <0.00010	` '					-			25-JAN-21
Aluminum (Al)-Dissolved <0.0010	Zirconium (Zr)-Dissolv	ed		<0.00020		mg/L		0.0002	25-JAN-21
Antimony (Sb)-Dissolved		ad		-0.0010		ma/l		0.004	05 100 04
Arsenic (As)-Dissolved <0.00010	` '					-			
Barium (Ba)-Dissolved <0.00010	, ,								
Bismuth (Bi)-Dissolved <0.000050 mg/L 0.00005 25-JAN-21 Boron (B)-Dissolved <0.010	` ,					-			
Boron (B)-Dissolved <0.010	` ,								
Cadmium (Cd)-Dissolved <0.000005C mg/L 0.000005 25-JAN-21 Calcium (Ca)-Dissolved <0.050	, ,					-			
Calcium (Ca)-Dissolved <0.050 mg/L 0.05 25-JAN-21 Chromium (Cr)-Dissolved <0.00010	,					-			
Chromium (Cr)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Cobalt (Co)-Dissolved <0.00010	` ,				C				
Cobalt (Co)-Dissolved <0.00010 mg/L 0.0001 25-JAN-21 Copper (Cu)-Dissolved <0.00020						-			
Copper (Cu)-Dissolved <0.00020 mg/L 0.0002 25-JAN-21 Iron (Fe)-Dissolved <0.010	, ,	/ed				-			
Iron (Fe)-Dissolved <0.010						-		0.0001	25-JAN-21
Lead (Pb)-Dissolved <0.000050	., , ,	i				-			
Lithium (Li)-Dissolved <0.0010	` ,					mg/L		0.01	25-JAN-21
Magnesium (Mg)-Dissolved <0.0050						-			25-JAN-21
Manganese (Mn)-Dissolved <0.00010								0.001	25-JAN-21
Molybdenum (Mo)-Dissolved <0.000050	, ,,			<0.0050		mg/L		0.005	25-JAN-21
Nickel (Ni)-Dissolved <0.00050 mg/L 0.0005 25-JAN-21 Phosphorus (P)-Dissolved <0.050	Manganese (Mn)-Disse	olved		<0.00010		mg/L		0.0001	25-JAN-21
Phosphorus (P)-Dissolved <0.050 mg/L 0.05 25-JAN-21	Molybdenum (Mo)-Diss	solved		<0.000050	1	mg/L		0.00005	25-JAN-21
•	Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	25-JAN-21
Potassium (K)-Dissolved <0.050 mg/L 0.05 25-JAN-21	Phosphorus (P)-Dissol	ved		<0.050		mg/L		0.05	25-JAN-21
	Potassium (K)-Dissolve	ed		<0.050		mg/L		0.05	25-JAN-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R5357483 WG3478433-5 MB								
Selenium (Se)-Dissolved	1		<0.000050)	mg/L		0.00005	25-JAN-21
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	25-JAN-21
Silver (Ag)-Dissolved			<0.000010)	mg/L		0.00001	25-JAN-21
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	25-JAN-21
Strontium (Sr)-Dissolved	1		<0.00020		mg/L		0.0002	25-JAN-21
Sulfur (S)-Dissolved			<0.50	_	mg/L		0.5	25-JAN-21
Thallium (TI)-Dissolved			<0.000010)	mg/L		0.00001	25-JAN-21
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	25-JAN-21
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	25-JAN-21
Uranium (U)-Dissolved			<0.000010)	mg/L		0.00001	25-JAN-21
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	25-JAN-21
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	25-JAN-21
Zirconium (Zr)-Dissolved	t		<0.00020		mg/L		0.0002	25-JAN-21
MET-T-CCMS-CL	Water							
Batch R5356216								
WG3476527-2 LCS Aluminum (Al)-Total		TMRM	108.0		%		90 400	21-JAN-21
Antimony (Sb)-Total			103.6		%		80-120	21-JAN-21 21-JAN-21
Arsenic (As)-Total			103.8		%		80-120	
			111.3		%		80-120	21-JAN-21
Barium (Ba)-Total Bismuth (Bi)-Total			103.1		%		80-120	21-JAN-21
` '							80-120	21-JAN-21
Boron (B)-Total			104.6		%		80-120	21-JAN-21
Cadmium (Cd)-Total			105.4		%		80-120	21-JAN-21
Calcium (Ca)-Total			101.8		%		80-120	21-JAN-21
Chromium (Cr)-Total			103.4		%		80-120	21-JAN-21
Cobalt (Co)-Total			104.9		%		80-120	21-JAN-21
Copper (Cu)-Total			103.9		%		80-120	21-JAN-21
Iron (Fe)-Total			97.0		%		80-120	21-JAN-21
Lead (Pb)-Total			105.3		%		80-120	21-JAN-21
Lithium (Li)-Total			101.7		%		80-120	21-JAN-21
Magnesium (Mg)-Total			113.9		%		80-120	21-JAN-21
Manganese (Mn)-Total			106.6		%		80-120	21-JAN-21
Molybdenum (Mo)-Total			103.5		%		80-120	21-JAN-21
Nickel (Ni)-Total			102.9		%		80-120	21-JAN-21



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MET-T-CCMS-CL	Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MO3476527-2 LCS	MET-T-CCMS-CL	Water							
Prosphorus (P)-Total 109.9 % 80.120 21-JAN-21 Potassium (K)-Total 109.5 % 80.120 21-JAN-21 Sileon (SI)-Total 102.0 % 80.120 21-JAN-21 Sileon (SI)-Total 102.0 % 80.120 21-JAN-21 Sileon (SI)-Total 104.3 % 60.140 21-JAN-21 Sileon (SI)-Total 97.7 % 80.120 21-JAN-21 Sileon (SI)-Total 108.3 % 80.120 21-JAN-21 Sodium (Na)-Total 108.3 % 80.120 21-JAN-21 Strontium (SI)-Total 105.9 % 80.120 21-JAN-21 Strontium (SI)-Total 105.9 % 80.120 21-JAN-21 Total 106.2 % 80.120 21-JAN-21 Total 106.2 % 80.120 21-JAN-21 Trialium (TI)-Total 104.4 % 80.120 21-JAN-21 Trialium (TI)-Total 102.9 % 80.120 21-JAN-21 Trianium (TI)-Total 106.1 % 80.120 21-JAN-21 Uranium (U)-Total 108.6 % 80.120 21-JAN-21 Uranium (U)-Total 103.6 % 80.120 21-JAN-21 Uranium (U)-Total 103.6 % 80.120 21-JAN-21 Uranium (U)-Total 102.3 % 80.120 21-JAN-21 Uranium (J)-Total 102.7 % 80.120 21-JAN-21 Uranium (SI)-Total 100.0000 mg/L 0.0000 21-JAN-21 Ansenic (As)-Total 100.0000 mg/L 0.0000 21-JAN-21 Ansenic (As)-Total 100.0000 mg/L 0.0000 21-JAN-21 Barium (Ba)-Total 100.0000 mg/L 0.0000 21-JAN-21 Barium (Ba)-Total 100.0000 mg/L 0.0000 21-JAN-21 Cobalt (Co)-Total 100.0000 mg/L 0.0000 21-JAN-21 Cobalt (Co)-Total 100.0000 mg/L 0.0000 21-JAN-21 Cobalt (Co)-Total 100.0000 mg/L 0.0000 21-JAN-21 Limium (L)-Total 100.0000 mg	Batch R5356216	;							
Potassium (K)-Total 109.5 % 80-120 21-JAN-21 Selenium (Se)-Total 102.0 % 80-120 21-JAN-21 Silicon (Si)-Total 104.3 % 60-140 21-JAN-21 Silver (Ag)-Total 97.7 % 80-120 21-JAN-21 Sodium (Na)-Total 108.3 % 80-120 21-JAN-21 Strontium (Sr)-Total 105.9 % 80-120 21-JAN-21 Sulfur (S)-Total 106.2 % 80-120 21-JAN-21 Thallium (Ti)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Tin (Sn)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (Y-)-Total 103.6 % 80-120 21-JAN-21 Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Wasadium (Y-)-Total 102.3 % 80-120 21-JAN-			TMRM						
Selenium (Se)-Total 102.0 % 80-120 21-JAN-21 Silicon (Si)-Total 104.3 % 60-140 21-JAN-21 Silver (Ag)-Total 97.7 % 80-120 21-JAN-21 Sodium (Na)-Total 108.3 % 80-120 21-JAN-21 Strontium (Sr)-Total 105.9 % 80-120 21-JAN-21 Sulfur (S)-Total 106.2 % 80-120 21-JAN-21 Thallium (TI)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Tinanium (T)-Total 106.1 % 80-120 21-JAN-21 Uranium (V)-Total 103.6 % 80-120 21-JAN-21 Uranium (V)-Total 107.3 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Vanadium (V)-Total 107.7 % 80-120 21-J									
Silicon (Si)-Total 104.3 % 60-140 21-JAN-21 Silver (Ag)-Total 97.7 % 80-120 21-JAN-21 Sodium (Na)-Total 108.3 % 80-120 21-JAN-21 Strontium (Sr)-Total 106.9 % 80-120 21-JAN-21 Sulfur (S)-Total 106.2 % 80-120 21-JAN-21 Thallium (Ti)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Tiranium (Ti)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (Y)-Total 107.3 % 80-120 21-JAN-21 Vanadium (Y)-Total 102.3 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (A)-Total 0.003 mg/L 0.003 21-JAN-21 Asheric (As)-Total 0.00010 mg/L 0.0001 21-JAN-21 Assenic (As)-Total 0.00010								80-120	
Silver (Ag)-Total 97.7 % 80-120 21-JAN-21 Sodium (Na)-Total 108.3 % 80-120 21-JAN-21 Strontium (Sr)-Total 105.9 % 80-120 21-JAN-21 Suffur (S)-Total 106.2 % 80-120 21-JAN-21 Thallium (Ti)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Titanium (Ti)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zinconium (Zr)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG347527-1 MB Aluminum (A)-Total <0.003								80-120	21-JAN-21
Sodium (Na)-Total 108.3								60-140	21-JAN-21
Strontium (Sr)-Total 105.9				97.7				80-120	21-JAN-21
Sulfur (S)-Total 106.2 % 80-120 21-JAN-21 Thallium (TI)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Titanium (TI)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (Al)-Total <0.0030	, ,			108.3		%		80-120	21-JAN-21
Thailium (TI)-Total 104.4 % 80-120 21-JAN-21 Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Titanium (Ti)-Total 106.1 % 80-120 21-JAN-21 Urandium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (Al)-Total <0.0030	Strontium (Sr)-Total			105.9		%		80-120	21-JAN-21
Tin (Sn)-Total 102.9 % 80-120 21-JAN-21 Titanium (Ti)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB M	Sulfur (S)-Total			106.2		%		80-120	21-JAN-21
Titanium (Ti)-Total 106.1 % 80-120 21-JAN-21 Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (Al)-Total <0.0030	Thallium (TI)-Total			104.4		%		80-120	21-JAN-21
Uranium (U)-Total 103.6 % 80-120 21-JAN-21 Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (Al)-Total <0.0030	Tin (Sn)-Total			102.9		%		80-120	21-JAN-21
Vanadium (V)-Total 107.3 % 80-120 21-JAN-21 Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB MB MIMINIMARY NMG 21-JAN-21 Antimony (Sb)-Total <0.00010	Titanium (Ti)-Total			106.1		%		80-120	21-JAN-21
Zinc (Zn)-Total 102.3 % 80-120 21-JAN-21 Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB MB MB MB Aluminum (Al)-Total <0.0030 mg/L 0.003 21-JAN-21 Antimony (Sb)-Total <0.00010 mg/L 0.0001 21-JAN-21 Arsenic (As)-Total <0.00010 mg/L 0.0001 21-JAN-21 Barium (Ba)-Total <0.00010 mg/L 0.0001 21-JAN-21 Bismuth (Bi)-Total <0.000050 mg/L 0.0005 21-JAN-21 Boron (B)-Total <0.010 mg/L 0.0005 21-JAN-21 Cadmium (Cd)-Total <0.000050 mg/L 0.00005 21-JAN-21 Calcium (Ca)-Total <0.050 mg/L 0.05 21-JAN-21 Cobalt (Co)-Total <0.0001 mg/L 0.0001 21-JAN-21 Copper (Cu)-Total <0.0005 mg/L 0.0005 21-JAN-21 Lead (Pb)-Total <0.0010 mg/L	Uranium (U)-Total			103.6		%		80-120	21-JAN-21
Zirconium (Zr)-Total 102.7 % 80-120 21-JAN-21 WG3476527-1 MB Aluminum (Al)-Total <0.0030	Vanadium (V)-Total			107.3		%		80-120	21-JAN-21
WG3476527-1 MB Aluminum (Al)-Total <0.0030	Zinc (Zn)-Total			102.3		%		80-120	21-JAN-21
Aluminum (Al)-Total <0.0030	Zirconium (Zr)-Total			102.7		%		80-120	21-JAN-21
Antimony (Sb)-Total	WG3476527-1 MB								
Arsenic (As)-Total <0.00010	Aluminum (Al)-Total			< 0.0030		mg/L		0.003	21-JAN-21
Barium (Ba)-Total <0.00010	, , ,			<0.00010		mg/L		0.0001	21-JAN-21
Bismuth (Bi)-Total <0.000050	Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-JAN-21
Boron (B)-Total <0.010	Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-JAN-21
Cadmium (Cd)-Total <0.000005C	Bismuth (Bi)-Total			<0.000050)	mg/L		0.00005	21-JAN-21
Calcium (Ca)-Total <0.050	Boron (B)-Total			<0.010		mg/L		0.01	21-JAN-21
Chromium (Cr)-Total <0.00010 mg/L 0.0001 21-JAN-21 Cobalt (Co)-Total <0.00010	Cadmium (Cd)-Total			<0.000005	iC .	mg/L		0.000005	21-JAN-21
Cobalt (Co)-Total <0.00010 mg/L 0.0001 21-JAN-21 Copper (Cu)-Total <0.00050	Calcium (Ca)-Total			<0.050		mg/L		0.05	21-JAN-21
Copper (Cu)-Total <0.00050	Chromium (Cr)-Total			<0.00010		mg/L		0.0001	21-JAN-21
Iron (Fe)-Total <0.010	Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-JAN-21
Lead (Pb)-Total <0.000050	Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-JAN-21
Lithium (Li)-Total <0.0010	Iron (Fe)-Total			<0.010		mg/L		0.01	21-JAN-21
Magnesium (Mg)-Total <0.0050	Lead (Pb)-Total			<0.000050	1	mg/L		0.00005	21-JAN-21
Manganese (Mn)-Total <0.00010	Lithium (Li)-Total			<0.0010		mg/L		0.001	21-JAN-21
Manganese (Mn)-Total <0.00010	Magnesium (Mg)-Total			<0.0050		mg/L		0.005	21-JAN-21
•	Manganese (Mn)-Total			<0.00010		mg/L		0.0001	
	Molybdenum (Mo)-Tota	al		<0.000050)	mg/L		0.00005	21-JAN-21
	Nickel (Ni)-Total			<0.00050				0.0005	21-JAN-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5356216 WG3476527-1 MB			0.050				0.07	
Phosphorus (P)-Total			<0.050		mg/L		0.05	21-JAN-21
Potassium (K)-Total			<0.050		mg/L		0.05	21-JAN-21
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-JAN-21
Silicon (Si)-Total			<0.050		mg/L		0.05	21-JAN-21
Silver (Ag)-Total			<0.000010		mg/L		0.00001	21-JAN-21
Sodium (Na)-Total			<0.050		mg/L		0.05	21-JAN-21
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	21-JAN-21
Sulfur (S)-Total			<0.50		mg/L		0.5	21-JAN-21
Thallium (TI)-Total			<0.000010	1	mg/L		0.00001	21-JAN-21
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-JAN-21
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-JAN-21
Uranium (U)-Total			<0.000010	1	mg/L		0.00001	21-JAN-21
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-JAN-21
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-JAN-21
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-JAN-21
NH3-L-F-CL	Water							
Batch R5356695 WG3477416-2 LCS Ammonia as N			93.9		%		85-115	22-JAN-21
WG3477416-1 MB Ammonia as N			<0.0050		mg/L		0.005	22-JAN-21
NO2-L-IC-N-CL	Water							
Batch R5356914								
WG3477689-7 DUP Nitrite (as N)		L2549508-7 <0.0010	<0.0010	RPD-NA	mg/L	N/A	20	19-JAN-21
WG3477689-2 LCS Nitrite (as N)			105.8		%		90-110	19-JAN-21
WG3477689-6 LCS Nitrite (as N)			101.5		%		90-110	19-JAN-21
WG3477689-1 MB Nitrite (as N)			<0.0010		mg/L		0.001	19-JAN-21
WG3477689-5 MB Nitrite (as N)			<0.0010		mg/L		0.001	19-JAN-21
WG3477689-8 MS Nitrite (as N)		L2549508-7	112.9		%		75-125	19-JAN-21
NO3-L-IC-N-CL	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-L-IC-N-CL	Water							
Batch R535	6914							
WG3477689-7 D Nitrate (as N)	OUP	L2549508-7 0.0364	0.0361		mg/L	0.8	20	19-JAN-21
WG3477689-2 L	cs							
Nitrate (as N)			106.4		%		90-110	19-JAN-21
WG3477689-6 L Nitrate (as N)	cs		104.5		%		90-110	19-JAN-21
WG3477689-1 Nitrate (as N)	1B		<0.0050		mg/L		0.005	19-JAN-21
WG3477689-5 N Nitrate (as N)	IB		<0.0050		mg/L		0.005	19-JAN-21
WG3477689-8 Nitrate (as N)	ıs	L2549508-7	118.1		%		75-125	19-JAN-21
PH/EC/ALK-CL	Water		-					10 0/11 21
Batch R535	5666							
WG3476222-18 D	UP	L2549508-6						
рН		8.08	8.08	J	рН	0.00	0.2	19-JAN-21
Conductivity (EC)		142	142		uS/cm	0.1	10	19-JAN-21
Bicarbonate (HCO	3)	92.6	90.6		mg/L	2.1	20	19-JAN-21
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	20	19-JAN-21
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	20	19-JAN-21
Alkalinity, Total (as	CaCO3)	75.9	74.3		mg/L	2.1	20	19-JAN-21
WG3476222-14 L	cs							
Conductivity (EC)			98.0		%		90-110	19-JAN-21
Alkalinity, Total (as	ŕ		101.9		%		85-115	19-JAN-21
WG3476222-17 L Conductivity (EC)	CS		98.7		%		90-110	19-JAN-21
Alkalinity, Total (as	CaCO3)		100.9		%		85-115	19-JAN-21
WG3476222-13 N								
Conductivity (EC)			<2.0		uS/cm		2	19-JAN-21
Bicarbonate (HCO	3)		<5.0		mg/L		5	19-JAN-21
Carbonate (CO3)			<5.0		mg/L		5	19-JAN-21
Hydroxide (OH)			<5.0		mg/L		5	19-JAN-21
Alkalinity, Total (as	CaCO3)		<2.0		mg/L		2	19-JAN-21
WG3476222-16 N	1B							
Conductivity (EC)			<2.0		uS/cm		2	19-JAN-21
Bicarbonate (HCO	3)		<5.0		mg/L		5	19-JAN-21
Carbonate (CO3)			<5.0		mg/L		5	19-JAN-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-CL	Water							
Batch R5355666								
WG3476222-16 MB Hydroxide (OH)			<5.0		mg/L		5	19-JAN-21
Alkalinity, Total (as CaC	CO3)		<2.0		mg/L		2	19-JAN-21
PO4-DO-L-COL-CL	Water							
Batch R5354317 WG3475411-10 LCS Orthophosphate-Dissolv			96.3		%		80-120	19-JAN-21
WG3475411-6 LCS Orthophosphate-Dissolv	ved (as P)		94.5		%		80-120	19-JAN-21
WG3475411-5 MB Orthophosphate-Dissolv	ved (as P)		<0.0010		mg/L		0.001	19-JAN-21
WG3475411-9 MB Orthophosphate-Dissolv	ved (as P)		<0.0010		mg/L		0.001	19-JAN-21
SO4-L-IC-N-CL	Water							
Batch R5356914								
WG3477689-7 DUP Sulfate (SO4)		L2549508-7 3.50	3.52		mg/L	0.4	20	19-JAN-21
WG3477689-2 LCS Sulfate (SO4)			106.0		%		85-115	19-JAN-21
WG3477689-6 LCS Sulfate (SO4)			104.9		%		85-115	19-JAN-21
WG3477689-1 MB Sulfate (SO4)			<0.050		mg/L		0.05	19-JAN-21
WG3477689-5 MB Sulfate (SO4)			<0.050		mg/L		0.05	19-JAN-21
WG3477689-8 MS Sulfate (SO4)		L2549508-7	119.0		%		75-125	19-JAN-21
TSS-L-CL	Water							
Batch R5354717								
WG3475652-2 LCS Total Suspended Solids	3		90.4		%		85-115	19-JAN-21
WG3475652-1 MB Total Suspended Solids	3		<1.0		mg/L		1	19-JAN-21
Batch R5355961								
WG3475471-8 LCS Total Suspended Solids	S		100.8		%		85-115	20-JAN-21
WG3475471-7 MB Total Suspended Solids	3		<1.0		mg/L		1	20-JAN-21

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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Hold Time Exceedances:

NO Decil of Decil 198	Sample	O P D	D. (. D	D UT	A = (1 1 2 T	1111	0
ALS Product Description	ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrate in Water by IC (Low	Level)						
	1	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	2	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
	3	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	4	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
	5	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	6	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	7	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	8	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	9	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	10	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	11	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	12	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
Nitrite in Water by IC (Low	Level)						
•	1	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	2	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
	3	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	4	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
	5	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	6	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	7	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	8	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	9	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	10	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	11	13-JAN-21 12:00	19-JAN-21 10:00	3	6	days	EHTR
	12	14-JAN-21 12:00	19-JAN-21 10:00	3	5	days	EHTR
Orthophosphate-Dissolved	(as P)						
	1	13-JAN-21 12:00	19-JAN-21 15:02	3	6	days	EHTR
	2	14-JAN-21 12:00	19-JAN-21 15:04	3	5	days	EHTR
	3	13-JAN-21 12:00	19-JAN-21 15:06	3	6	days	EHTR
	4	14-JAN-21 12:00	19-JAN-21 15:06	3	5	days	EHTR
	5	13-JAN-21 12:00	19-JAN-21 15:06	3	6	days	EHTR
	6	13-JAN-21 12:00	19-JAN-21 15:09	3	6	days	EHTR
	7	13-JAN-21 12:00	19-JAN-21 15:09	3	6	days	EHTR
	8	13-JAN-21 12:00	19-JAN-21 15:09	3	6	days	EHTR
	9	13-JAN-21 12:00	19-JAN-21 15:11	3	6	days	EHTR
	10	13-JAN-21 12:00	19-JAN-21 15:11	3	6	days	EHTR
	11	13-JAN-21 12:00	19-JAN-21 15:11	3	6	days	EHTR
	12	14-JAN-21 12:00	19-JAN-21 15:13	3	5	days	EHTR

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2549508 were received on 19-JAN-21 08:50.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Fo





Canada Toll Free: 1 800 668 9878

L2549508-COFC

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Report To	Contact and company name below will ap	pear on the final report	Calast Bases 6	Reports / F			<u> </u>			_				queste									
Company:	Sperling Hansen Associates Inc.		Select Report F		EXCEL , C	` '	1	_	-					arges ap									
Contact:	Scott Garthwaite		4	I Reports with COA			=	4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum						İ	AFFIX ALS BARCODE LABEL HERE			-RF					
Phone:	778-471-7088		4-	Tage			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						(ALS use only)			.,,,,,							
	Company address below will appear on the \mathfrak{k}_{\parallel}	nal report		t Distribution: DEPARE 1				1 day (E) if received by 3pm M-F - 100% rush surcharge minimum															
Street:	1225 East Keith Road			sgarthwaite@sper			Sa fee	Same day [E2] if received by 10am M-S - 200% rush surcharge. Addition fees may apply to rush requests on weekends, statutory holidays and non						litional non-									
City/Province:	North Vancouver, B.C.	·	Email 2	chetherington@sp	erlinghansen.co	m	rol	routine tests															
Postal Code:	V7J 1J3		Email 3			-		Date ar	nd Time											nm am/	pm		
Invoice To	Same as Report To YES	☑ NO	L	Invoice Re	ecipients		<u></u>			For	all tests	with rus	h TATs (equestec	, plea	se contac	t your Af	f to cor	firm ava	ilability.			
	Copy of Invoice with Report	□ NO	Select Invoice	Distribution: 🗵 EN	MAIL MAIL	FAX								Analy	sis	Reque	st						
Company:			Email 1 or Fax	rhajjafari@spertin	ghansen.com		RS			ndicate	Filtered	(F), Pi	eserve	(P) or f	iltere	d and Pr	eserved	(F/P) b	elow			ü	(S)
Contact:			Email 2] 🖳	L] '	볼	ğ
	Project Information		Oi	I and Gas Require	d Fields (client	use)	AINERS	1 .	d												اما	ឲ្	je j
ALS Account	# / Quote #:		AFE/Cost Center:		PO#		15														ובו	2	s)
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ALS Lab Wor	k Order# (ALS'use only):		ALS Contact:	Dean Watt	Sampler: Ty	m . 1	NUMBER		Fotal Alkalinity		Dissolved Metals	als (P)				orthophosphorous					SAMPLES	EXTENDED (SUSPECTED HAZARD (see notes)
ALS Sample #	Sample Identification	n and/or Coordinates	<u> </u>	Date	Time	CRNG	1 🖁	_o	∦a		Pe	Fotal Metals	Ammonia			ğ		ŀ	İ		탈	I Z I	E
(ALS use only)	› (This description will		ر. پورون	(dd-mmm-yy)	(hh:mm)	Sample Type	13	hions	lag	158	isso	ga	Ě		2	₹	g	9 8			١٨		S
1	E257246	- PP		13-01-21	1	Surface Water	 -	╀~	-	-	-	-	×		\rightarrow		X			+	۳	۳	<u>8</u>
 	E257244			ļ./	1	 	+	*	>	Υ		×	-	-	4	×		-1-		+			$\vdash \vdash$
				14-01-21		Groundwater	5	X	×	×	×		×			×	×			↓	<u> </u>	<u>:</u>	
3	E257247	·	·	13-01-21		Surface Water	5	X	.>	×		*	く	,		<u> </u>	X	<u> </u>	Ι`_		$oxed{oxed}$		
9	E257237			14-01-21		Groundwater	5	×	7	*	×	1	×	3	<	X	×	×					
5	E257235			13-01-21	74	Groundwater	5	K	у	×	X		¥		ĸ	×	×	*					
6	E257250			13-01-21		Surface Water	5	٠,٢٠	×	×		x	×	7	,	7	×	×			-		
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8	E257239			13-01-21		Groundwater	5	X	>	x	×		×	1	×	X	×	×					
٩	E257245			13 - 01 -21		Surface Water	5	X	×	×		×	×		;	X	×			1	-		
10.	E257242			13-01-21		Groundwater	5	1	>	1	×		x	_		×	×		+	+		\Box	
(1	E257236	į .		13 - 01-21	,	Groundwater	5	~	7	×	×		×		7	×	×	-	1	1			\neg
12	E257238			14-01-21		Groundwater	5	F	*	7	X		×	,	(×	×	7					
Drinkina	Water (DW) Samples ¹ (client use)	Notes / Specify		evaluation by selecting	ng from drop-dow	n below					Š	AMP	LE RE	CEIPT	DET	AILS (ALS u	se on	y)				
		<u> </u>		xcel COC only)			Cooli	ing Me	thod:		NONE		ICE	ICE	PACK	s 🗌	FROZE	1		COOLING	INITI	ATED	
		British Columbia Contar		•	7		Subn	nissio	n Com	ment	s ident	ified c	n San	ple Re	ceip	t Notifi	cation:	[YES		NO		
_		British Columbia Approv	red and Working	Water Quality Guid	lelines (MAY, 20	15)	Cool	er Cus						☐ N/A		Sample						_ N	I/A
Are samples for	human consumption/ use?	,					<u> </u>	IN مر	IITIAL (COOLE	R TEM	ERAT	JRES 4	>	1		FINAL	COOL	ER TEN	/PERAT	JRES º	С	\Box
Y	ES 🗹 NO .							7		لعمد					_					<u> </u>			
5.4	SHIPMENT RELEASE (client use			NITIAL SHIPMENT	, , , , , , , , , , , , , , , , , , ,	LS use only)																	
Released by:	Wind 18/01/2	• 1	Received by:	10	Date:	19	Time	4)	ived	oy:			D	ate:						Time:		
REFER TO BACK	PAGE FOR ALS LOCATIONS AND SAMPLIN	G INFORMATION		(WHI	E - LABORATOR	Y COPY YELL	-ow:≺	CLIEN	T CO	Ϋ́												AUG 2020	O FRONT



Sperling Hansen Associates Inc.

ATTN: Scott Garthwaite #8 - 1225 East Keith Road North Vancouver BC V7J 1J3 Date Received: 04-MAY-21

Report Date: 14-MAY-21 16:34 (MT)

Version: FINAL

Client Phone: 604-986-7723

Certificate of Analysis

Lab Work Order #: L2583674

Project P.O. #:

NOT SUBMITTED

Job Reference:

20050 FERNIE

C of C Numbers: Legal Site Desc:

Patryk Wojciak, B.Sc., P.Chem. Account Manager

 $[This\ report\ shall\ not\ be\ reproduced\ except\ in\ full\ without\ the\ written\ authority\ of\ the\ Laboratory.]$

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company



L2583674 CONTD.... PAGE 2 of 13

PAGE 2 of 13 14-MAY-21 16:34 (MT)

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-1 SURFACE WATE 29-APR-21 08:00 E257246	L2583674-2 GROUND WATE 29-APR-21 08:00 E257244	L2583674-3 SURFACE WATE 29-APR-21 08:00 E257247	L2583674-4 GROUND WATE 29-APR-21 08:00 E257237	L2583674-5 GROUND WATE 29-APR-21 08:00 E257235
Grouping	Analyte	-				
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	85.3	190	50.9	496	253
	Temperature (Degree C)	20.2	20.0	19.9	19.9	19.9
	Total Suspended Solids (mg/L)	<1.0	371	9.7	12.4	429
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	98.5	190	55.6	406	245
	Ammonia as N (mg/L)	<0.0050	0.0086	0.0079	0.229	0.377
	Bicarbonate (HCO3) (mg/L)	120	222	67.8	496	299
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	0.52	8.33	0.25	7.44	2.29
	Conductivity (EC) (uS/cm)	192	375	114	725	449
	Fluoride (F) (mg/L)	0.049	0.067	0.047	0.040	<0.020
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	0.0484	0.0087	0.0803	0.875	0.0051
	Nitrate (as N) (mg/L)	0.0484	0.0087	0.0803	0.871	0.0051
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	0.0043	<0.0010
	pH (pH)	8.13	8.39	7.82	7.95	8.17
	Orthophosphate-Dissolved (as P) (mg/L)	0.0066	0.0022	0.0066	0.0035	<0.0010
	Sulfate (SO4) (mg/L)	3.82	11.4	2.79	17.3	4.48
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	4.39	9.5	7.31	6.09	<5.0
Total Metals	Aluminum (Al)-Total (mg/L)	0.0896		0.449		
	Antimony (Sb)-Total (mg/L)	0.00012		0.00014		
	Arsenic (As)-Total (mg/L)	0.00023		0.00036		
	Barium (Ba)-Total (mg/L)	0.213		0.155		
	Beryllium (Be)-Total (mg/L)	<0.000020		0.000031		
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.0000350		0.0000720		
	Calcium (Ca)-Total (mg/L)	26.2		14.7		
	Chromium (Cr)-Total (mg/L)	0.00020		0.00065		
	Cobalt (Co)-Total (mg/L)	<0.00010		0.00019		
	Copper (Cu)-Total (mg/L)	0.00065		0.00114		
	Iron (Fe)-Total (mg/L)	0.067		0.424		
	Lead (Pb)-Total (mg/L)	0.000053		0.000326		
	Lithium (Li)-Total (mg/L)	0.0056		0.0050		
	Magnesium (Mg)-Total (mg/L)	4.80		3.45		
	Manganese (Mn)-Total (mg/L)	0.00118		0.0109		
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.0000050		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2583674 CONTD....

PAGE 3 of 13 14-MAY-21 16:34 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-6 SURFACE WATE 28-APR-21 08:00 E257250	L2583674-7 GROUND WATE 28-APR-21 08:00 E257239	L2583674-8 SURFACE WATE 28-APR-21 08:00 E257245	L2583674-9 GROUND WATE 28-APR-21 08:00 E257242	L2583674-10 SURFACE WATE 29-APR-21 08:00 E257243
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	97.6 HTC	129	50.1	306	63.1
	Temperature (Degree C)	19.9	19.9	20.0	20.3	20.5
	Total Suspended Solids (mg/L)	3.7	2150	28.5	52.6	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	110	136	53.3	297	66.6
	Ammonia as N (mg/L)	0.0055	0.0100	0.0073	0.0597	0.0084
	Bicarbonate (HCO3) (mg/L)	134	166	65.0	363	81.3
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	0.30	0.74	0.15	1.76	0.21
	Conductivity (EC) (uS/cm)	210	258	106	515	131
	Fluoride (F) (mg/L)	0.042	0.039	0.027	0.028	0.026
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	0.0066	0.0428	0.0670	<0.0051	<0.0051
	Nitrate (as N) (mg/L)	0.0066	0.0428	0.0670	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	pH (pH)	8.22	8.29	7.75	8.09	7.96
	Orthophosphate-Dissolved (as P) (mg/L)	0.0047	0.0044	0.0075	<0.0010	0.0048
	Sulfate (SO4) (mg/L)	3.20	5.37	1.54	2.59	2.44
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	6.01	30.0	8.53	4.54	5.85
Total Metals	Aluminum (Al)-Total (mg/L)	0.303		2.13		
	Antimony (Sb)-Total (mg/L)	<0.00010		0.00013		
	Arsenic (As)-Total (mg/L)	0.00031		0.00092		
	Barium (Ba)-Total (mg/L)	0.133		0.122		
	Beryllium (Be)-Total (mg/L)	<0.000020		0.000130		
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.0000223		0.0000393		
	Calcium (Ca)-Total (mg/L)	31.2		16.3		
	Chromium (Cr)-Total (mg/L)	0.00042		0.00212		
	Cobalt (Co)-Total (mg/L)	<0.00010		0.00079		
	Copper (Cu)-Total (mg/L)	0.00065		0.00216		
	Iron (Fe)-Total (mg/L)	0.245		2.02		
	Lead (Pb)-Total (mg/L)	0.000170		0.00126		
	Lithium (Li)-Total (mg/L)	0.0031		0.0038		
	Magnesium (Mg)-Total (mg/L)	4.74		2.30		
	Manganese (Mn)-Total (mg/L)	0.00942		0.0286		
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.000050		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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14-MAY-21 16:34 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-11 SURFACE WATE 28-APR-21 08:00 E257240	L2583674-12 GROUND WATE 29-APR-21 08:00 E257236	L2583674-13 GROUND WATE 29-APR-21 08:00 E257238	
Grouping	Analyte				
WATER					
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 94.5	242	292	
	Temperature (Degree C)	20.3	20.1	20.1	
	Total Suspended Solids (mg/L)	3.1			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	106	254	233	
	Ammonia as N (mg/L)	<0.0050	0.273	0.0664	
	Bicarbonate (HCO3) (mg/L)	129	301	284	
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	
	Chloride (CI) (mg/L)	0.29	1.98	7.56	
	Conductivity (EC) (uS/cm)	207	460	473	
	Fluoride (F) (mg/L)	0.036	0.033	0.039	
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	
	Nitrate and Nitrite (as N) (mg/L)	0.0108	<0.0051	<0.0051	
	Nitrate (as N) (mg/L)	0.0108	<0.0050	<0.0050	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	
	pH (pH)	8.21	8.35	7.98	
	Orthophosphate-Dissolved (as P) (mg/L)	0.0018	<0.0010	<0.0010	
	Sulfate (SO4) (mg/L)	3.19	4.45	14.9	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	5.22	4.13	2.79	
Total Metals	Aluminum (Al)-Total (mg/L)	0.260			
	Antimony (Sb)-Total (mg/L)	<0.00010			
	Arsenic (As)-Total (mg/L)	0.00025			
	Barium (Ba)-Total (mg/L)	0.123			
	Beryllium (Be)-Total (mg/L)	<0.000020			
	Bismuth (Bi)-Total (mg/L)	<0.000050			
	Boron (B)-Total (mg/L)	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.0000186			
	Calcium (Ca)-Total (mg/L)	30.1			
	Chromium (Cr)-Total (mg/L)	0.00027			
	Cobalt (Co)-Total (mg/L)	<0.00010			
	Copper (Cu)-Total (mg/L)	0.00053			
	Iron (Fe)-Total (mg/L)	0.188			
	Lead (Pb)-Total (mg/L)	0.000104			
	Lithium (Li)-Total (mg/L)	0.0030			
	Magnesium (Mg)-Total (mg/L)	4.70			
	Manganese (Mn)-Total (mg/L)	0.00562			
	Mercury (Hg)-Total (mg/L)	<0.000050			

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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14-MAY-21 16:34 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-1 SURFACE WATE 29-APR-21 08:00 E257246	L2583674-2 GROUND WATE 29-APR-21 08:00 E257244	L2583674-3 SURFACE WATE 29-APR-21 08:00 E257247	L2583674-4 GROUND WATE 29-APR-21 08:00 E257237	L2583674-5 GROUND WATE 29-APR-21 08:00 E257235
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000429		0.000401		
	Nickel (Ni)-Total (mg/L)	<0.00050		0.00099		
	Phosphorus (P)-Total (mg/L)	<0.050		<0.050		
	Potassium (K)-Total (mg/L)	0.61		0.57		
	Selenium (Se)-Total (mg/L)	0.000477		0.000490		
	Silicon (Si)-Total (mg/L)	2.15		2.40		
	Silver (Ag)-Total (mg/L)	<0.00010		0.000025		
	Sodium (Na)-Total (mg/L)	1.58		1.16		
	Strontium (Sr)-Total (mg/L)	0.0966		0.0654		
	Sulfur (S)-Total (mg/L)	1.47		1.11		
	Thallium (TI)-Total (mg/L)	<0.00010		0.000017		
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Total (mg/L)	0.00131		0.00491		
	Uranium (U)-Total (mg/L)	0.000279		0.000146		
	Vanadium (V)-Total (mg/L)	0.00064		0.00170		
	Zinc (Zn)-Total (mg/L)	<0.0030		0.0039		
	Zirconium (Zr)-Total (mg/L)	<0.00030		<0.00030		
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0016		0.0022	0.0027
	Antimony (Sb)-Dissolved (mg/L)		<0.00010		0.00021	<0.00010
	Arsenic (As)-Dissolved (mg/L)		<0.00010		0.00033	0.00404
	Barium (Ba)-Dissolved (mg/L)		0.0982		0.329	0.715
	Beryllium (Be)-Dissolved (mg/L)		<0.000020		<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050		<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)		0.023		0.138	0.027
	Cadmium (Cd)-Dissolved (mg/L)		0.0000387		0.000209	0.000411
	Calcium (Ca)-Dissolved (mg/L)		54.5		162	83.0
	Chromium (Cr)-Dissolved (mg/L)		<0.00010		0.00011	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		<0.00010		0.00019	0.00269
	Copper (Cu)-Dissolved (mg/L)		0.00038		0.00255	0.00098
	Iron (Fe)-Dissolved (mg/L)		<0.010		0.011	2.17
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050	0.000131
	Lithium (Li)-Dissolved (mg/L)		0.0125		0.0047	0.0057
	Magnesium (Mg)-Dissolved (mg/L)		13.1		22.4	11.1
	Manganese (Mn)-Dissolved (mg/L)		0.00047		0.00271	2.35
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050		<0.000050	<0.0000050

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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14-MAY-21 16:34 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-6 SURFACE WATE 28-APR-21 08:00 E257250	L2583674-7 GROUND WATE 28-APR-21 08:00 E257239	L2583674-8 SURFACE WATE 28-APR-21 08:00 E257245	L2583674-9 GROUND WATE 28-APR-21 08:00 E257242	L2583674-10 SURFACE WATE 29-APR-21 08:00 E257243
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000632		0.000238		
	Nickel (Ni)-Total (mg/L)	0.00057		0.00224		
	Phosphorus (P)-Total (mg/L)	<0.050		0.089		
	Potassium (K)-Total (mg/L)	0.78		1.29		
	Selenium (Se)-Total (mg/L)	0.000131		0.000139		
	Silicon (Si)-Total (mg/L)	3.66		5.61		
	Silver (Ag)-Total (mg/L)	<0.000010		0.000030		
	Sodium (Na)-Total (mg/L)	1.50		1.14		
	Strontium (Sr)-Total (mg/L)	0.154		0.0996		
	Sulfur (S)-Total (mg/L)	1.16		0.55		
	Thallium (TI)-Total (mg/L)	0.000011		0.000051		
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Total (mg/L)	0.00381		0.0149		
	Uranium (U)-Total (mg/L)	0.000133		0.000095		
	Vanadium (V)-Total (mg/L)	0.00091		0.00453		
	Zinc (Zn)-Total (mg/L)	<0.0030		0.0096		
	Zirconium (Zr)-Total (mg/L)	<0.00030		0.00031		
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0262		0.0032	0.156
	Antimony (Sb)-Dissolved (mg/L)		0.00011		<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)		0.00015		0.00091	0.00017
	Barium (Ba)-Dissolved (mg/L)		0.154		0.562	0.100
	Beryllium (Be)-Dissolved (mg/L)		<0.000020		<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050		<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)		0.013		0.038	<0.010
	Cadmium (Cd)-Dissolved (mg/L)		0.0000198		0.00208	0.0000071
	Calcium (Ca)-Dissolved (mg/L)		42.7		101	20.8
	Chromium (Cr)-Dissolved (mg/L)		<0.00010		<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		<0.00010		0.00578	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00279		0.00064	0.00060
	Iron (Fe)-Dissolved (mg/L)		0.022		0.484	0.063
	Lead (Pb)-Dissolved (mg/L)		0.000062		<0.000050	0.000098
	Lithium (Li)-Dissolved (mg/L)		0.0074		0.0051	0.0013
	Magnesium (Mg)-Dissolved (mg/L)		5.56		12.8	2.70
	Manganese (Mn)-Dissolved (mg/L)		0.00123		2.02 RRV	0.00173
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050		<0.0000050	<0.0000050

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-11 SURFACE WATE 28-APR-21 08:00 E257240	L2583674-12 GROUND WATE 29-APR-21 08:00 E257236	L2583674-13 GROUND WATE 29-APR-21 08:00 E257238	
Grouping	Analyte				
WATER					
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000637			
	Nickel (Ni)-Total (mg/L)	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.050			
	Potassium (K)-Total (mg/L)	0.75			
	Selenium (Se)-Total (mg/L)	0.000134			
	Silicon (Si)-Total (mg/L)	3.56			
	Silver (Ag)-Total (mg/L)	<0.000010			
	Sodium (Na)-Total (mg/L)	1.51			
	Strontium (Sr)-Total (mg/L)	0.153			
	Sulfur (S)-Total (mg/L)	1.09			
	Thallium (TI)-Total (mg/L)	0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.00328			
	Uranium (U)-Total (mg/L)	0.000125			
	Vanadium (V)-Total (mg/L)	0.00076			
	Zinc (Zn)-Total (mg/L)	<0.0030			
	Zirconium (Zr)-Total (mg/L)	<0.00030			
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	
	Dissolved Metals Filtration Location		FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0125	0.0011	
	Antimony (Sb)-Dissolved (mg/L)		<0.00010	<0.00010	
	Arsenic (As)-Dissolved (mg/L)		0.00403	0.00011	
	Barium (Ba)-Dissolved (mg/L)		0.654	0.350	
	Beryllium (Be)-Dissolved (mg/L)		<0.000020	<0.000020	
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	
	Boron (B)-Dissolved (mg/L)		0.024	0.020	
	Cadmium (Cd)-Dissolved (mg/L)		0.0000812	0.0000548	
	Calcium (Ca)-Dissolved (mg/L)		78.5	84.7	
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	<0.00010	
	Cobalt (Co)-Dissolved (mg/L)		0.00258	0.00013	
	Copper (Cu)-Dissolved (mg/L)		0.00064	<0.00020	
	Iron (Fe)-Dissolved (mg/L)		2.15	<0.010	
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)		0.0067	0.0095	
	Magnesium (Mg)-Dissolved (mg/L)		11.2	19.4	
	Manganese (Mn)-Dissolved (mg/L)		1.97	1.13 RRV	
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050	<0.0000050	

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-1 SURFACE WATE 29-APR-21 08:00 E257246	L2583674-2 GROUND WATE 29-APR-21 08:00 E257244	L2583674-3 SURFACE WATE 29-APR-21 08:00 E257247	L2583674-4 GROUND WATE 29-APR-21 08:00 E257237	L2583674-5 GROUND WATE 29-APR-21 08:00 E257235
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)		0.000379		0.000159	0.00104
	Nickel (Ni)-Dissolved (mg/L)		<0.00050		0.00158	0.00414
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		0.69		9.19	1.70
	Selenium (Se)-Dissolved (mg/L)		0.000412		0.000209	<0.000050
	Silicon (Si)-Dissolved (mg/L)		3.42		5.39	4.43
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)		3.03		9.64	4.06
	Strontium (Sr)-Dissolved (mg/L)		0.339		0.610	0.290
	Sulfur (S)-Dissolved (mg/L)		4.40		7.37	1.96
	Thallium (TI)-Dissolved (mg/L)		<0.000010		0.000034	0.000103
	Tin (Sn)-Dissolved (mg/L)		<0.00010		0.00015	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.000232		0.00227	0.000537
	Vanadium (V)-Dissolved (mg/L)		<0.00050		<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		<0.0010		0.0031	0.0046
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Chemical Oxygen Demand (mg/L)	14	43	17	16	34

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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ALS ENVIRONMENTAL ANALYTICAL REPORT

L2583674-6 L2583674-7 L2583674-8 L2583674-9 L2583674-10 Sample ID **GROUND WATE** Description SURFACE WATE GROUND WATE SURFACE WATE SURFACE WATE 28-APR-21 28-APR-21 29-APR-21 Sampled Date 28-APR-21 28-APR-21 08:00 08:00 08:00 08:00 Sampled Time 08:00 E257250 E257239 E257245 E257242 E257243 Client ID Grouping Analyte **WATER Dissolved Metals** Molybdenum (Mo)-Dissolved (mg/L) 0.000634 0.000440 0.000192 Nickel (Ni)-Dissolved (mg/L) 0.00992 < 0.00050 < 0.00050 Phosphorus (P)-Dissolved (mg/L) < 0.050 < 0.050 < 0.050 Potassium (K)-Dissolved (mg/L) 0.64 1.59 0.54 Selenium (Se)-Dissolved (mg/L) 0.000231 < 0.000050 0.000083 Silicon (Si)-Dissolved (mg/L) 3.29 3.04 4.08 Silver (Ag)-Dissolved (mg/L) < 0.000010 < 0.000010 < 0.000010 Sodium (Na)-Dissolved (mg/L) 2.82 1.04 3.14 Strontium (Sr)-Dissolved (mg/L) 0.331 0.384 0.0773 Sulfur (S)-Dissolved (mg/L) 2.12 1.30 1.20 Thallium (TI)-Dissolved (mg/L) < 0.000010 0.000068 < 0.000010 Tin (Sn)-Dissolved (mg/L) < 0.00010 < 0.00010 < 0.00010 Titanium (Ti)-Dissolved (mg/L) 0.00033 < 0.00030 0.00197 Uranium (U)-Dissolved (mg/L) 0.000172 0.00107 0.000065 Vanadium (V)-Dissolved (mg/L) < 0.00050 < 0.00050 < 0.00050 Zinc (Zn)-Dissolved (mg/L) 0.0013 0.0087 <0.0010 Zirconium (Zr)-Dissolved (mg/L) < 0.00030 0.00056 < 0.00030 Aggregate Biochemical Oxygen Demand (mg/L) <2.0 <2.0 <2.0 <2.0 <2.0 **Organics** Chemical Oxygen Demand (mg/L) 11 90 29 15 14

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2583674-11 SURFACE WATE 28-APR-21 08:00 E257240	L2583674-12 GROUND WATE 29-APR-21 08:00 E257236	L2583674-13 GROUND WATE 29-APR-21 08:00 E257238	
Grouping	Analyte				
WATER					
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)		0.000862	0.00160	
	Nickel (Ni)-Dissolved (mg/L)		0.00534	0.00239	
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	
	Potassium (K)-Dissolved (mg/L)		1.57	1.23	
	Selenium (Se)-Dissolved (mg/L)		<0.000050	<0.000050	
	Silicon (Si)-Dissolved (mg/L)		4.13	5.04	
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)		3.85	4.56	
	Strontium (Sr)-Dissolved (mg/L)		0.287	0.286	
	Sulfur (S)-Dissolved (mg/L)		1.84	5.53	
	Thallium (TI)-Dissolved (mg/L)		0.000102	0.000045	
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)		<0.00030	<0.00030	
	Uranium (U)-Dissolved (mg/L)		0.000662	0.00147	
	Vanadium (V)-Dissolved (mg/L)		<0.00050	<0.00050	
	Zinc (Zn)-Dissolved (mg/L)		0.0036	<0.0010	
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030	<0.00030	
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	2.3	<2.0	
	Chemical Oxygen Demand (mg/L)	14	16	<10	

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Qualifiers	for Sam	ple Submi	ssion Listed:
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F257240

E257235

E257250

L2583674-11

L2583674-5

L2583674-6

L2583674-9

Qualifiers for Sample Submission Listed:								
Qualifier	Description							
EHR Exceeded Recommended Holding Time prior to receipt at the lab HOLD TIME FOR BOD, NO2,NO3,PO4 EXCEEDED UPON RECEIPT								
Qualifiers for Ir	ndividual Samples Listed	:						
Sample Number	Client Sample ID	Qualifier	Description					
L2583674-1	E257246	EHR	Exceeded Recommended Holding Time prior to receipt at the lab BOD went past hold time prior to receipt at ALS					
L2583674-10	E257243	EHR	Exceeded Recommended Holding Time prior to receipt at the lab BOD went past hold time prior to receipt at ALS					

			time prior to receipt at ALS
L2583674-12	E257236	EHR	Exceeded Recommended Holding Time prior to receipt at the lab BOD went past hold
			time prior to receipt at ALS
L2583674-13	E257238	EHR	Exceeded Recommended Holding Time prior to receipt at the lab BOD went past hold
			time prior to receipt at ALS

EHR

EHR

EHR

EHR

L2583674-2 E257244 EHR Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold time prior to receipt at ALS Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold L2583674-3 E257247 EHR time prior to receipt at ALS L2583674-4 E257237 EHR

Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold time prior to receipt at ALS Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold

Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold

time prior to receipt at ALS Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold time prior to receipt at ALS

Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold L2583674-7 E257239 **EHR** time prior to receipt at ALS L2583674-8 E257245 **EHR** Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold time prior to receipt at ALS

> Exceeded Recommended Holding Time prior to receipt at the lab. - BOD went past hold time prior to receipt at ALS

QC Samples with Qualifiers & Comments:

E257242

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)	
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2583674-10, -12, -13, -2, -4, -5, -7, -9	
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2583674-10, -12, -13, -2, -4, -5, -7, -9	
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2583674-10, -12, -13, -2, -4, -5, -7, -9	
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2583674-10, -12, -13, -2, -4, -5, -7, -9	
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2583674-10, -12, -13, -2, -4, -5, -7, -9	

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**				
BE-D-L-CCMS-CL	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)				

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-CL Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BOD-BC-CL Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode Water

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a

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dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-CL

Water

Total Organic Carbon

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-L-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry

Samples are analyzed using the closed reflux colourimetric method

F-L-IC-CL Water Fluoride APHA 4110 B-Ion Chromatography

HARDNESS-CALC-CL Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents.

Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-CL Water Dissolved Mercury in Water by CVAAS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction

with stannous chloride, and analyzed by CVAAS.

HG-T-CVAA-CL Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-CL Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH/EC/ALK-CL Water pH, Conductivity and Total Alkalinity APHA 4500H,2510,2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.

Alkalinity measurement is based on the sample's capacity to neutralize acid

Conductivity measurement is based on the sample's capacity to convey an electric current

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-L-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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TEMP-CLWaterTemperatureAPHA 2550-ThermometerTSS-L-CLWaterTotal Suspended SolidsAPHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour 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.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L2583674 Report Date: 14-MAY-21 Page 1 of 15

Client: Sperling Hansen Associates Inc.

#8 - 1225 East Keith Road North Vancouver BC V7J 1J3

Contact: Scott Garthwaite

Test	Matrix	Reference	Result Q	lualifier	Units	RPD	Limit	Analyzed
BE-D-L-CCMS-CL	Water							
Batch R5454857 WG3531421-10 LCS Beryllium (Be)-Dissolved		TMRM	104.2		%		80-120	08-MAY-21
WG3531421-9 MB Beryllium (Be)-Dissolved			<0.000020		mg/L		0.00002	08-MAY-21
BE-T-L-CCMS-CL	Water							
Batch R5453343 WG3530285-3 DUP Beryllium (Be)-Total		L2583674-11 <0.000020	<0.000020	RPD-NA	mg/L	N/A	20	07-MAY-21
WG3530285-2 LCS Beryllium (Be)-Total		TMRM	95.9		%		80-120	06-MAY-21
WG3530285-1 MB Beryllium (Be)-Total			<0.000020		mg/L		0.00002	06-MAY-21
BOD-BC-CL Batch R5455217 WG3531795-5 LCS	Water		27.0		0/			
Biochemical Oxygen Der WG3531795-4 MB Biochemical Oxygen Der			97.3		% mg/L		85-115 2	05-MAY-21 05-MAY-21
C-TOT-ORG-LOW-CL	Water							
Batch R5456314 WG3533268-3 DUP Total Organic Carbon		L2583674-13 2.79	2.79		mg/L	0.2	20	10-MAY-21
WG3533268-2 LCS Total Organic Carbon			106.3		%		80-120	10-MAY-21
WG3533268-1 MB Total Organic Carbon			<0.50		mg/L		0.5	10-MAY-21
WG3533268-4 MS Total Organic Carbon		L2583674-13	97.1		%		70-130	10-MAY-21
CL-L-IC-N-CL	Water							
Batch R5455239 WG3531965-15 DUP Chloride (Cl)		L2583674-13 7.56	7.55		mg/L	0.1	20	05-MAY-21
WG3531965-11 LCS Chloride (Cl)			100.2		%		85-115	05-MAY-21
WG3531965-14 LCS Chloride (CI)			100.2		%		85-115	05-MAY-21
WG3531965-2 LCS								



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Workorder: L2583674 Report Date: 14-MAY-21

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-CL	Water							
	455239							
WG3531965-2 Chloride (CI)	LCS		102.8		%		85-115	05-MAY-21
WG3531965-5 Chloride (CI)	LCS		100.6		%		85-115	05-MAY-21
WG3531965-8 Chloride (Cl)	LCS		101.0		%		85-115	05-MAY-21
WG3531965-1 Chloride (CI)	MB		<0.10		mg/L		0.1	05-MAY-21
WG3531965-10 Chloride (CI)	МВ		<0.10		mg/L		0.1	05-MAY-21
WG3531965-13 Chloride (CI)	МВ		<0.10		mg/L		0.1	05-MAY-21
WG3531965-4 Chloride (CI)	МВ		<0.10		mg/L		0.1	05-MAY-21
WG3531965-7 Chloride (Cl)	МВ		<0.10		mg/L		0.1	05-MAY-21
COD-T-COL-CL	Water							
	450898							
WG3529634-2 Chemical Oxyge	LCS en Demand		98.9		%		85-115	05-MAY-21
WG3529634-1 Chemical Oxyge	MB en Demand		<10		mg/L		10	05-MAY-21
F-L-IC-CL	Water							
	455239							
WG3531965-15 Fluoride (F)	DUP	L2583674-13 0.039	0.039		mg/L	0.5	20	05-MAY-21
WG3531965-11 Fluoride (F)	LCS		94.3		%		85-115	05-MAY-21
WG3531965-14 Fluoride (F)	LCS		92.6		%		85-115	05-MAY-21
WG3531965-2 Fluoride (F)	LCS		93.4		%		85-115	05-MAY-21
WG3531965-5 Fluoride (F)	LCS		94.5		%		85-115	05-MAY-21
WG3531965-8 Fluoride (F)	LCS		94.7		%		85-115	05-MAY-21
WG3531965-1 Fluoride (F)	МВ		<0.020		mg/L		0.02	05-MAY-21



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Test	Matrix	Reference	Result Qualifie	er Units	RPD	Limit	Analyzed
F-L-IC-CL	Water						
Batch R5455239 WG3531965-10 MB Fluoride (F)			<0.020	mg/L		0.02	05-MAY-21
WG3531965-13 MB Fluoride (F)			<0.020	mg/L		0.02	05-MAY-21
WG3531965-4 MB Fluoride (F)			<0.020	mg/L		0.02	05-MAY-21
WG3531965-7 MB Fluoride (F)			<0.020	mg/L		0.02	05-MAY-21
HG-D-CVAA-CL	Water						
Batch R5455905							
WG3532700-2 LCS Mercury (Hg)-Dissolved			101.0	%		80-120	11-MAY-21
WG3532700-1 MB Mercury (Hg)-Dissolved			<0.0000050	mg/L		0.000005	11-MAY-21
HG-T-CVAA-CL	Water						
Batch R5455905 WG3532703-2 LCS Mercury (Hg)-Total			94.3	%		80-120	11-MAY-21
WG3532703-1 MB Mercury (Hg)-Total			<0.0000050	mg/L		0.000005	11-MAY-21
MET-D-CCMS-CL	Water						
Batch R5454857 WG3531421-10 LCS		TMRM					
Aluminum (Al)-Dissolved			109.9	%		80-120	08-MAY-21
Antimony (Sb)-Dissolved			108.3	%		80-120	08-MAY-21
Arsenic (As)-Dissolved			103.7	%		80-120	08-MAY-21
Barium (Ba)-Dissolved			103.3	%		80-120	08-MAY-21
Bismuth (Bi)-Dissolved			101.0	%		80-120	08-MAY-21
Boron (B)-Dissolved	J		102.9	%		80-120	08-MAY-21
Cadmium (Cd)-Dissolved Calcium (Ca)-Dissolved	ı		103.3	%		80-120	08-MAY-21
Chromium (Cr)-Dissolved	٨		101.6 104.7	%		80-120	08-MAY-21
Cobalt (Co)-Dissolved	u		104.7	%		80-120	08-MAY-21
Copper (Cu)-Dissolved				%		80-120	08-MAY-21
., , ,			103.4			80-120	08-MAY-21
Iron (Fe)-Dissolved			105.9	%		80-120	08-MAY-21
Lead (Pb)-Dissolved			101.4	%		80-120	08-MAY-21



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Test Matrix	x Reference	Result Qualif	ier Units	RPD	Limit	Analyzed
MET-D-CCMS-CL Wate	r					
Batch R5454857						
WG3531421-10 LCS	TMRM					
Lithium (Li)-Dissolved		95.6	%		80-120	08-MAY-21
Magnesium (Mg)-Dissolved		106.3	%		80-120	08-MAY-21
Manganese (Mn)-Dissolved		105.4	%		80-120	08-MAY-21
Molybdenum (Mo)-Dissolved		106.2	%		80-120	08-MAY-21
Nickel (Ni)-Dissolved		104.1	%		80-120	08-MAY-21
Phosphorus (P)-Dissolved		113.8	%		70-130	08-MAY-21
Potassium (K)-Dissolved		104.8	%		80-120	08-MAY-21
Selenium (Se)-Dissolved		101.5	%		80-120	08-MAY-21
Silicon (Si)-Dissolved		106.7	%		60-140	08-MAY-21
Silver (Ag)-Dissolved		106.4	%		80-120	08-MAY-21
Sodium (Na)-Dissolved		103.5	%		80-120	08-MAY-21
Strontium (Sr)-Dissolved		106.0	%		80-120	08-MAY-21
Sulfur (S)-Dissolved		112.9	%		80-120	08-MAY-21
Thallium (TI)-Dissolved		102.7	%		80-120	08-MAY-21
Tin (Sn)-Dissolved		106.6	%		80-120	08-MAY-21
Titanium (Ti)-Dissolved		88.3	%		80-120	08-MAY-21
Uranium (U)-Dissolved		104.6	%		80-120	08-MAY-21
Vanadium (V)-Dissolved		106.6	%		80-120	08-MAY-21
Zinc (Zn)-Dissolved		103.4	%		80-120	08-MAY-21
Zirconium (Zr)-Dissolved		107.0	%		80-120	08-MAY-21
WG3531421-9 MB						
Aluminum (Al)-Dissolved		<0.0010	mg/L		0.001	08-MAY-21
Antimony (Sb)-Dissolved		<0.00010	mg/L		0.0001	08-MAY-21
Arsenic (As)-Dissolved		<0.00010	mg/L		0.0001	08-MAY-21
Barium (Ba)-Dissolved		<0.00010	mg/L		0.0001	08-MAY-21
Bismuth (Bi)-Dissolved		<0.000050	mg/L		0.00005	08-MAY-21
Boron (B)-Dissolved		<0.010	mg/L		0.01	08-MAY-21
Cadmium (Cd)-Dissolved		<0.0000050	mg/L		0.000005	08-MAY-21
Calcium (Ca)-Dissolved		<0.050	mg/L		0.05	08-MAY-21
Chromium (Cr)-Dissolved		<0.00010	mg/L		0.0001	08-MAY-21
Cobalt (Co)-Dissolved		<0.00010	mg/L		0.0001	08-MAY-21
Copper (Cu)-Dissolved		<0.00020	mg/L		0.0002	08-MAY-21
Iron (Fe)-Dissolved		<0.010	mg/L		0.01	08-MAY-21
Lead (Pb)-Dissolved			•			···· · · · ·



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R5454857								
WG3531421-9 MB								
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	08-MAY-21
Magnesium (Mg)-Dissolv			<0.0050		mg/L		0.005	08-MAY-21
Manganese (Mn)-Dissolv			<0.00010		mg/L		0.0001	08-MAY-21
Molybdenum (Mo)-Dissol	ved		<0.000050		mg/L		0.00005	08-MAY-21
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	08-MAY-21
Phosphorus (P)-Dissolve	d		<0.050		mg/L		0.05	08-MAY-21
Potassium (K)-Dissolved			<0.050		mg/L		0.05	08-MAY-21
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	08-MAY-21
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	08-MAY-21
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	08-MAY-21
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	08-MAY-21
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	08-MAY-21
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	08-MAY-21
Thallium (TI)-Dissolved			<0.000010		mg/L		0.00001	08-MAY-21
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	08-MAY-21
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	08-MAY-21
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	08-MAY-21
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	08-MAY-21
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	08-MAY-21
Zirconium (Zr)-Dissolved			<0.00020		mg/L		0.0002	08-MAY-21
MET-T-CCMS-CL	Water							
Batch R5453343								
WG3530285-3 DUP Aluminum (Al)-Total		L2583674-11 0.260	0.269		mg/L	3.3	20	07 MAY 24
Antimony (Sb)-Total		<0.00010	<0.00010	DDD NA	mg/L			07-MAY-21
Arsenic (As)-Total		0.00010	0.00010	RPD-NA	•	N/A	20	07-MAY-21
Barium (Ba)-Total		0.00023	0.00020		mg/L	4.3	20	07-MAY-21
Bismuth (Bi)-Total				DDD MA	mg/L	2.8	20	07-MAY-21
` ,		<0.000050	<0.000050		mg/L	N/A	20	07-MAY-21
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	07-MAY-21
Cadmium (Cd)-Total		0.0000186	0.0000151	J	mg/L	0.000003	0.00001	07-MAY-21
Calcium (Ca)-Total		30.1	30.3		mg/L	0.8	20	07-MAY-21
Chromium (Cr)-Total		0.00027	0.00029		mg/L	9.3	20	07-MAY-21
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-MAY-21
Copper (Cu)-Total		0.00053	0.00058		mg/L	8.6	20	07-MAY-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5453343								
WG3530285-3 DUP		L2583674-11	0.400		4			
Iron (Fe)-Total		0.188	0.183		mg/L	2.8	20	07-MAY-21
Lead (Pb)-Total		0.000104	0.000107		mg/L	3.2	20	07-MAY-21
Lithium (Li)-Total		0.0030	0.0031		mg/L	2.5	20	07-MAY-21
Magnesium (Mg)-Total		4.70	4.76		mg/L	1.3	20	07-MAY-21
Manganese (Mn)-Total		0.00562	0.00578		mg/L	2.9	20	07-MAY-21
Molybdenum (Mo)-Total		0.000637	0.000649		mg/L	1.9	20	07-MAY-21
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	07-MAY-21
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	07-MAY-21
Potassium (K)-Total		0.75	0.77		mg/L	2.2	20	07-MAY-21
Selenium (Se)-Total		0.000134	0.000149		mg/L	11	20	07-MAY-21
Silicon (Si)-Total		3.56	3.59		mg/L	0.7	20	07-MAY-21
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	07-MAY-21
Sodium (Na)-Total		1.51	1.53		mg/L	1.6	20	07-MAY-21
Strontium (Sr)-Total		0.153	0.156		mg/L	1.8	20	07-MAY-21
Sulfur (S)-Total		1.09	1.10		mg/L	0.6	20	07-MAY-21
Thallium (TI)-Total		0.000010	0.000010		mg/L	1.2	20	07-MAY-21
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-MAY-21
Titanium (Ti)-Total		0.00328	0.00293		mg/L	11	20	07-MAY-21
Uranium (U)-Total		0.000125	0.000131		mg/L	4.4	20	07-MAY-21
Vanadium (V)-Total		0.00076	0.00082		mg/L	7.5	20	07-MAY-21
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	07-MAY-21
Zirconium (Zr)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	07-MAY-21
WG3530285-2 LCS		TMRM						
Aluminum (Al)-Total			99.4		%		80-120	06-MAY-21
Antimony (Sb)-Total			97.2		%		80-120	06-MAY-21
Arsenic (As)-Total			93.4		%		80-120	06-MAY-21
Barium (Ba)-Total			100.1		%		80-120	06-MAY-21
Bismuth (Bi)-Total			91.6		%		80-120	06-MAY-21
Boron (B)-Total			100.3		%		80-120	06-MAY-21
Cadmium (Cd)-Total			93.0		%		80-120	06-MAY-21
Calcium (Ca)-Total			109.3		%		80-120	06-MAY-21
Chromium (Cr)-Total			97.9		%		80-120	06-MAY-21
Cobalt (Co)-Total			98.1		%		80-120	06-MAY-21
Copper (Cu)-Total			96.6		%		80-120	06-MAY-21



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MET-T-CCMS-CL	Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
WG3530285-2 LCS TMRM	MET-T-CCMS-CL	Water							
Iron (Fe)-Total	Batch R5453343	;							
Lead (Pb)-Total			TMRM						
Lithium (Li)-Total 106.4 % 80-120 06-MAY-21 Magnesium (Mg)-Total 107.0 % 80-120 06-MAY-21 Manganese (Mn)-Total 95.8 % 80-120 06-MAY-21 Molybdenum (Mo)-Total 94.2 % 80-120 06-MAY-21 Nickel (N)-Total 95.6 % 80-120 06-MAY-21 Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (Si)-Total 98.1 % 80-120 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Strontium (Sr)-Total 91.8 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120									
Magnesium (Mg)-Total 107.0 % 80-120 06-MAY-21 Manganese (Mn)-Total 95.8 % 80-120 06-MAY-21 Molybdenum (Mo)-Total 94.2 % 80-120 06-MAY-21 Nickel (Ni)-Total 95.6 % 80-120 06-MAY-21 Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Siliver (Ag)-Total 98.1 % 80-120 06-MAY-21 Siliver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Strintium (Sr)-Total 91.8 % 80-120 06-MAY-21 Tin (Sr)-Total 92.7 % 80-120 06-MAY-21 Uranium (T)-Total 92.7 % 80-120									06-MAY-21
Manganese (Mn)-Total 95.8 % 80-120 06-MAY-21 Molybdenum (Mo)-Total 94.2 % 80-120 06-MAY-21 Nickel (Ni)-Total 95.6 % 80-120 06-MAY-21 Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (S)-Total 98.1 % 80-120 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Storntium (Sr)-Total 90.8 % 80-120 06-MAY-21 Stuffur (S)-Total 90.8 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Thallium (TI)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06	` ,							80-120	
Molybdenum (Mo)-Total 94.2 % 80-120 06-MAY-21 Nickel (Ni)-Total 95.6 % 80-120 06-MAY-21 Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (S)-Total 98.1 % 80-120 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strottum (Sr)-Total 90.8 % 80-120 06-MAY-21 Strottum (Sr)-Total 86.2 % 80-120 06-MAY-21 Thallium (Tl)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Tl)-Total 92.7 % 80-120 06-MAY-21 Vanadium (V)-Total 91.1 % 80-120 06-MAY	\$ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \							80-120	
Nickel (Ni)-Total 95.6 % 80-120 06-MAY-21 Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (Si)-Total 98.1 % 60-140 06-MAY-21 Silicon (Si)-Total 98.1 % 80-120 06-MAY-21 Silicon (Si)-Total 90.6 % 80-120 06-MAY-21 Silicon (Si)-Total 90.6 % 80-120 06-MAY-21 Silicon (Si)-Total 112.1 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Tinallium (Ti)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 92.7 % 80-120 06-MAY-21 Vanadium (V)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zinc (Zn)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (A)-Total 90.00010 mg/L 0.0001 06-MAY-21 Arsenic (As)-Total 9.00010 mg/L 0.0001 06-MAY-21 Barium (Ba)-Total 9.00010 mg/L 0.0001 06-MAY-21 Barium (Ba)-Total 9.000050 mg/L 0.00005 06-MAY-21 Cadmium (Co)-Total 9.000050 mg/L 0.00005 06-MAY-21								80-120	06-MAY-21
Phosphorus (P)-Total 96.2 % 70-130 06-MAY-21 Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (Si)-Total 98.1 % 60-140 06-MAY-21 Silicon (Si)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Stoftur (S)-Total 90.8 % 80-120 06-MAY-21 Stuffur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (Ti)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Vanadium (V)-Total 92.3 % 80-120 06-MAY-21 <td></td> <td>al</td> <td></td> <td>94.2</td> <td></td> <td></td> <td></td> <td>80-120</td> <td>06-MAY-21</td>		al		94.2				80-120	06-MAY-21
Potassium (K)-Total 107.6 % 80-120 06-MAY-21 Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (S)-Total 98.1 % 60-140 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Tin (Sn)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Nickel (Ni)-Total							80-120	06-MAY-21
Selenium (Se)-Total 88.1 % 80-120 06-MAY-21 Silicon (Si)-Total 98.1 % 60-140 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (Ti)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Vanadium (V)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Phosphorus (P)-Total			96.2		%		70-130	06-MAY-21
Silicon (Si)-Total 98.1 % 60-140 06-MAY-21 Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Uranium (V)-Total 91.1 % 80-120 06-MAY-21 Zirco (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirco (Zn)-Total 101.5 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total 0.0030 mg/L 0.003 06-MAY-21 Arisenic (As)-Total <0.00010 </td <td>Potassium (K)-Total</td> <td></td> <td></td> <td>107.6</td> <td></td> <td>%</td> <td></td> <td>80-120</td> <td>06-MAY-21</td>	Potassium (K)-Total			107.6		%		80-120	06-MAY-21
Silver (Ag)-Total 90.6 % 80-120 06-MAY-21 Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (Ti)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 101.5 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (A)-Total 0.0030 mg/L 0.003 06-MAY-21 Arsenic (As)-Total <0.00010	Selenium (Se)-Total			88.1		%		80-120	06-MAY-21
Sodium (Na)-Total 112.1 % 80-120 06-MAY-21 Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (Ti)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total 0.0030 mg/L 0.003 06-MAY-21 Arsenic (As)-Total <0.00010	Silicon (Si)-Total			98.1		%		60-140	06-MAY-21
Strontium (Sr)-Total 90.8 % 80-120 06-MAY-21 Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zirc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Silver (Ag)-Total			90.6		%		80-120	06-MAY-21
Sulfur (S)-Total 86.2 % 80-120 06-MAY-21 Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Sodium (Na)-Total			112.1		%		80-120	06-MAY-21
Thallium (TI)-Total 91.8 % 80-120 06-MAY-21 Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (TI)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB MB Aluminum (Al)-Total <0.0030	Strontium (Sr)-Total			90.8		%		80-120	06-MAY-21
Tin (Sn)-Total 92.4 % 80-120 06-MAY-21 Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Sulfur (S)-Total			86.2		%		80-120	06-MAY-21
Titanium (Ti)-Total 92.7 % 80-120 06-MAY-21 Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Thallium (TI)-Total			91.8		%		80-120	06-MAY-21
Uranium (U)-Total 91.1 % 80-120 06-MAY-21 Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Tin (Sn)-Total			92.4		%		80-120	06-MAY-21
Vanadium (V)-Total 108.3 % 80-120 06-MAY-21 Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB MB Aluminum (Al)-Total <0.0030	Titanium (Ti)-Total			92.7		%		80-120	06-MAY-21
Zinc (Zn)-Total 101.5 % 80-120 06-MAY-21 Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Uranium (U)-Total			91.1		%		80-120	06-MAY-21
Zirconium (Zr)-Total 92.3 % 80-120 06-MAY-21 WG3530285-1 MB Aluminum (Al)-Total <0.0030	Vanadium (V)-Total			108.3		%		80-120	06-MAY-21
WG3530285-1 MB Aluminum (Al)-Total <0.0030	Zinc (Zn)-Total			101.5		%		80-120	06-MAY-21
Aluminum (Al)-Total <0.0030	Zirconium (Zr)-Total			92.3		%		80-120	06-MAY-21
Antimony (Sb)-Total <0.00010	WG3530285-1 MB								
Arsenic (As)-Total <0.00010	Aluminum (Al)-Total			<0.0030		mg/L		0.003	06-MAY-21
Barium (Ba)-Total <0.00010	Antimony (Sb)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Bismuth (Bi)-Total <0.000050	Arsenic (As)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Boron (B)-Total <0.010	Barium (Ba)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Cadmium (Cd)-Total <0.000005C mg/L 0.000005 06-MAY-21 Calcium (Ca)-Total <0.050	Bismuth (Bi)-Total			<0.000050	1	mg/L		0.00005	06-MAY-21
Calcium (Ca)-Total <0.050 mg/L 0.05 06-MAY-21 Chromium (Cr)-Total <0.00010	Boron (B)-Total			<0.010		mg/L		0.01	06-MAY-21
Chromium (Cr)-Total <0.00010 mg/L 0.0001 06-MAY-21	Cadmium (Cd)-Total			<0.000005	SC .	mg/L		0.000005	06-MAY-21
	Calcium (Ca)-Total			<0.050		mg/L		0.05	06-MAY-21
O - b - b (O -) T - b - b	Chromium (Cr)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Copait (Co)- i otal <0.00010 mg/L 0.0001 06-MAY-21	Cobalt (Co)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Copper (Cu)-Total <0.00050 mg/L 0.0005 06-MAY-21	Copper (Cu)-Total			<0.00050		mg/L		0.0005	06-MAY-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5453343 WG3530285-1 MB Iron (Fe)-Total			<0.010		mg/L		0.01	06-MAY-21
Lead (Pb)-Total			<0.000050		mg/L		0.00005	06-MAY-21
Lithium (Li)-Total			<0.0010		mg/L		0.001	06-MAY-21
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	06-MAY-21
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	06-MAY-21
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	06-MAY-21
Phosphorus (P)-Total			<0.050		mg/L		0.05	06-MAY-21
Potassium (K)-Total			<0.050		mg/L		0.05	06-MAY-21
Selenium (Se)-Total			<0.000050		mg/L		0.00005	06-MAY-21
Silicon (Si)-Total			<0.050		mg/L		0.05	06-MAY-21
Silver (Ag)-Total			<0.000010		mg/L		0.00001	06-MAY-21
Sodium (Na)-Total			<0.050		mg/L		0.05	06-MAY-21
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	06-MAY-21
Sulfur (S)-Total			<0.50		mg/L		0.5	06-MAY-21
Thallium (TI)-Total			<0.000010		mg/L		0.00001	06-MAY-21
Tin (Sn)-Total			<0.00010		mg/L		0.0001	06-MAY-21
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	06-MAY-21
Uranium (U)-Total			<0.000010		mg/L		0.00001	06-MAY-21
Vanadium (V)-Total			<0.00050		mg/L		0.0005	06-MAY-21
Zinc (Zn)-Total			<0.0030		mg/L		0.003	06-MAY-21
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	06-MAY-21
NH3-L-F-CL	Water							
Batch R5454777 WG3531211-6 LCS Ammonia as N			101.6		%		85-115	07-MAY-21
WG3531211-5 MB			101.0		70		00-110	07-IVIA 1-21
Ammonia as N			<0.0050		mg/L		0.005	07-MAY-21
NO2-L-IC-N-CL	Water							
Batch R5455239 WG3531965-15 DUP Nitrite (as N)		L2583674-13 < 0.0010	<0.0010	RPD-NA	mg/L	N/A	20	05-MAY-21
WG3531965-11 LCS Nitrite (as N)		10.0010	100.7	III D IIA	%	14/1	90-110	05-MAY-21
WG3531965-14 LCS								



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Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-CL		Water							
Batch R54	155239								
WG3531965-14 Nitrite (as N)	LCS			100.6		%		90-110	05-MAY-21
WG3531965-2 Nitrite (as N)	LCS			104.1		%		90-110	05-MAY-21
WG3531965-5 Nitrite (as N)	LCS			101.3		%		90-110	05-MAY-21
WG3531965-8 Nitrite (as N)	LCS			101.7		%		90-110	05-MAY-21
WG3531965-1 Nitrite (as N)	МВ			<0.0010		mg/L		0.001	05-MAY-21
WG3531965-10 Nitrite (as N)	МВ			<0.0010		mg/L		0.001	05-MAY-21
WG3531965-13 Nitrite (as N)	МВ			<0.0010		mg/L		0.001	05-MAY-21
WG3531965-4 Nitrite (as N)	МВ			<0.0010		mg/L		0.001	05-MAY-21
WG3531965-7 Nitrite (as N)	МВ			<0.0010		mg/L		0.001	05-MAY-21
NO3-L-IC-N-CL		Water							
Batch R54	55239								
WG3531965-15 Nitrate (as N)	DUP		L2583674-13 < 0.0050	<0.0050	RPD-NA	mg/L	N/A	20	05-MAY-21
WG3531965-11 Nitrate (as N)	LCS			100.4		%		90-110	05-MAY-21
WG3531965-14 Nitrate (as N)	LCS			100.5		%		90-110	05-MAY-21
WG3531965-2 Nitrate (as N)	LCS			103.2		%		90-110	05-MAY-21
WG3531965-5 Nitrate (as N)	LCS			100.9		%		90-110	05-MAY-21
WG3531965-8 Nitrate (as N)	LCS			101.3		%		90-110	05-MAY-21
WG3531965-1 Nitrate (as N)	МВ			<0.0050		mg/L		0.005	05-MAY-21
WG3531965-10 Nitrate (as N)	МВ			<0.0050		mg/L		0.005	05-MAY-21
WG3531965-13 Nitrate (as N)	МВ			<0.0050		mg/L		0.005	05-MAY-21
WG3531965-4	МВ					Č			J



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st Matrix	Reference	Result	Qualifier	l lmito	555		
		Nesuit	Qualifier	Units	RPD	Limit	Analyzed
O3-L-IC-N-CL Water							
Batch R5455239							
WG3531965-4 MB Nitrate (as N)		<0.0050		mg/L		0.005	05-MAY-21
WG3531965-7 MB				3		0.000	00 1111/11 21
Nitrate (as N)		<0.0050		mg/L		0.005	05-MAY-21
H/EC/ALK-CL Water							
Batch R5457043							
WG3534115-45 DUP	L2583674-13	7.00		m1.1			
pH	7.98	7.98	J	pН	0.00	0.2	12-MAY-21
Conductivity (EC)	473	479		uS/cm	1.3	10	12-MAY-21
Bicarbonate (HCO3)	284	296		mg/L	4.2	20	12-MAY-21
Carbonate (CO3)	<5.0	<5.0	RPD-NA	mg/L	N/A	20	12-MAY-21
Hydroxide (OH)	<5.0	<5.0	RPD-NA	mg/L	N/A	20	12-MAY-21
Alkalinity, Total (as CaCO3)	233	243		mg/L	4.2	20	12-MAY-21
WG3534115-40 LCS Conductivity (EC)		104.6		%		90-110	12-MAY-21
Alkalinity, Total (as CaCO3)		100.7		%		85-115	12-MAY-21
WG3534115-43 LCS				,,		00-110	12-101/(1-21
Conductivity (EC)		103.2		%		90-110	12-MAY-21
Alkalinity, Total (as CaCO3)		97.7		%		85-115	12-MAY-21
WG3534115-41 MB							
Conductivity (EC)		<2.0		uS/cm		2	12-MAY-21
Bicarbonate (HCO3)		<5.0		mg/L		5	12-MAY-21
Carbonate (CO3)		<5.0		mg/L		5	12-MAY-21
Hydroxide (OH)		<5.0		mg/L		5	12-MAY-21
Alkalinity, Total (as CaCO3)		<2.0		mg/L		2	12-MAY-21
WG3534115-44 MB							
Conductivity (EC)		<2.0		uS/cm		2	12-MAY-21
Bicarbonate (HCO3)		<5.0		mg/L		5	12-MAY-21
Carbonate (CO3)		<5.0		mg/L		5	12-MAY-21
Hydroxide (OH)		<5.0		mg/L		5	12-MAY-21
Alkalinity, Total (as CaCO3)		<2.0		mg/L		2	12-MAY-21
O4-DO-L-COL-CL Water							
Batch R5451376							
WG3529637-8 DUP Orthophosphate-Dissolved (as P)	L2583674-1 0.0066	0.0074		mg/L	40	20	05 MAY 04
	0.0000	0.0074		mg/L	12	20	05-MAY-21
WG3529637-10 LCS Orthophosphate-Dissolved (as P)		103.3		%		80-120	05-MAY-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-L-COL-CL	Water							
	451376							
WG3529637-7 Orthophosphate	LCS -Dissolved (as P)		101.6		%		80-120	05-MAY-21
WG3529637-2 Orthophosphate	MB -Dissolved (as P)		<0.0010		mg/L		0.001	05-MAY-21
WG3529637-3 Orthophosphate	MB -Dissolved (as P)		<0.0010		mg/L		0.001	05-MAY-21
WG3529637-9 Orthophosphate	MS -Dissolved (as P)	L2583674-10	103.5		%		70-130	05-MAY-21
SO4-L-IC-N-CL	Water							
	455239							
WG3531965-15 Sulfate (SO4)	DUP	L2583674-13 14.9	14.9		mg/L	0.1	20	05-MAY-21
WG3531965-11 Sulfate (SO4)	LCS		99.2		%		85-115	05-MAY-21
WG3531965-14 Sulfate (SO4)	LCS		99.2		%		85-115	05-MAY-21
WG3531965-2 Sulfate (SO4)	LCS		101.7		%		85-115	05-MAY-21
WG3531965-5 Sulfate (SO4)	LCS		99.6		%		85-115	05-MAY-21
WG3531965-8 Sulfate (SO4)	LCS		99.8		%		85-115	05-MAY-21
WG3531965-1 Sulfate (SO4)	МВ		<0.050		mg/L		0.05	05-MAY-21
WG3531965-10 Sulfate (SO4)	МВ		<0.050		mg/L		0.05	05-MAY-21
WG3531965-13 Sulfate (SO4)	МВ		<0.050		mg/L		0.05	05-MAY-21
WG3531965-4 Sulfate (SO4)	МВ		<0.050		mg/L		0.05	05-MAY-21
WG3531965-7 Sulfate (SO4)	МВ		<0.050		mg/L		0.05	05-MAY-21
TEMP-CL	Water							
Batch R54	457043							
WG3534115-45 Temperature	DUP	L2583674-13 20.1	20.1		Degree C	0.0	25	12-MAY-21

TSS-L-CL Water



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TSS-L-CL	Water							
Batch R545 WG3530339-2 L Total Suspended	_CS		106.8		%		85-115	06-MAY-21
WG3530339-1 Notal Suspended	MB Solids		<1.0		mg/L		1	06-MAY-21

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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Hold Time Exceedances:

	Sample						
ALS Product Description	ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifie
Physical Tests							
Total Suspended Solids							
Total Suspended Solids	6	28-APR-21 08:00	06-MAY-21 14:30	7	0	dave	EHTL
	7		06-MAY-21 14:30	7	8	days	EHTL
		28-APR-21 08:00			8	days	
	8	28-APR-21 08:00	06-MAY-21 14:30	7	8	days	EHTL
	9	28-APR-21 08:00	06-MAY-21 14:30	7	8	days	EHTL
	11	28-APR-21 08:00	06-MAY-21 14:30	7	8	days	EHTL
Anions and Nutrients							
Nitrate in Water by IC (Lov	v Level)						
	1	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	2	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	3	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	4	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	5	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	6	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	7	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	8	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
						-	
	9	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	10	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	11	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	12	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	13	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
Nitrite in Water by IC (Low	Level)						
	1	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	2	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	3	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	4	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	5	29-APR-21 08:00	05-MAY-21 13:10	3	6	days	EHTR
	6	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	7	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
	8	28-APR-21 08:00	05-MAY-21 13:10	3	7	days	EHTR
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	5	29-APR-21 08:00	05-MAY-21 16:00	3	6	days	EHTR
	6	28-APR-21 08:00	05-MAY-21 16:00	3	7	days	EHTR
	7	28-APR-21 08:00	05-MAY-21 16:00	3	7	days	EHTR
	8	28-APR-21 08:00	05-MAY-21 16:10	3	7	days	EHTR
	9	28-APR-21 08:00	05-MAY-21 16:13	3	7	days	EHTR
	10	29-APR-21 08:00	05-MAY-21 16:22	3	6	days	EHTR
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Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Workorder: L2583674 Report Date: 14-MAY-21 Page 15 of 15

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2583674 were received on 04-MAY-21 09:10.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.





alytical Request Form

B00 668 9878

COC Number: 20 -

L2583674-COFC

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Report To	Contact and company name below will ap	pear on the linal report		Reports / R	Recipients				Tu	mano	und Ti	me (T	AT) R	ques	ted	*							,	
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7_	E257244 •			29.09.2021		Groundwater	5	R	R	R	R		R	R	R	R	R	R	R			_	\neg	
2	E257247			29.04.2821		Surface Water	5	R	R	R	┝╌╢	R	R	R	R	R	R	R	R					
3	E257237 2			29.04.2021		Groundwater	5	R	R	R	R	•	R	R	R	R	R	R	R		-3	-		_
9	E257235 A			29.04.202		Groundwater		R	R	R	R		R	R	R	R	R	R	R	$\overline{}$				<u> </u>
	E257250 /2		*	<u> </u>		Surface Water	5	R	R	R		R	R	R	R	R	R	R	R			\neg	\neg	_
6				28-64-2021		Groundwater		R	R	R	R	IX.	R	R	R	R	R	R	R		 			\vdash
7	E257239 / ,		<u> </u>	28.04.2021		Surface Water	}_	R	R	R	 ^	R	R	R	R	R	-R	R	R	 				_
4	E257245 •			28-04-2071	-		3	R	R	R	R		R	R-	P	В.		- R						
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7	E257252 .					Groundwater	0	R	R			K.	R				R-	R		<u> </u>		 		\vdash
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Canada Toll Free: 1 800 668 9878

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Page 2 of 2

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14	E257240 ***		18-04-2021		Surface Water	1	R	R	R		R	R	R	∘ R	R	R	R	R			-		
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Sperling Hansen Associates Inc.

ATTN: Scott Garthwaite #8 - 1225 East Keith Road North Vancouver BC V7J 1J3 Date Received: 30-JUL-21

Report Date: 10-AUG-21 16:23 (MT)

Version: FINAL

Client Phone: 604-986-7723

Certificate of Analysis

Lab Work Order #: L2621328

Project P.O. #:

NOT SUBMITTED

Job Reference:

20050 FERNIE

C of C Numbers: Legal Site Desc:

Patryk Wojciak, B.Sc., P.Chem. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company



L2621328 CONTD....

PAGE 2 of 9 10-AUG-21 16:23 (MT)

Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-1 Surface Water 27-JUL-21 12:00 E257246	L2621328-2 Surface Water 27-JUL-21 12:00 E257247	L2621328-3 Groundwater 27-JUL-21 12:00 E257238	L2621328-4 Groundwater 27-JUL-21 12:00 E257235	L2621328-5 Groundwater 27-JUL-21 12:00 E257239
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 124	107	291	246	148
	Temperature (Degree C)	20.4	20.5	20.5	20.5	20.5
	Total Suspended Solids (mg/L)	1.6	1.2			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	132	115	309	280	169
	Ammonia as N (mg/L)	0.0055	<0.0050	0.0128	0.385	0.0309
	Bicarbonate (HCO3) (mg/L)	161	140	376	341	207
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	0.40	0.33	7.66	1.74	0.69
	Conductivity (EC) (uS/cm)	232	203	539	468	300
	Fluoride (F) (mg/L)	0.022	0.079	<0.020	<0.020	0.023
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	<0.0051	0.0103	0.0540	0.0076	0.118
	Nitrate (as N) (mg/L)	<0.0050	0.0103	0.0529	0.0076	0.117
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	0.0013
	pH (pH)	7.84	7.69	8.02	7.97	7.83
	Orthophosphate-Dissolved (as P) (mg/L)	0.0061	0.0105	0.0017	0.0014	0.0087
	Sulfate (SO4) (mg/L)	3.26	3.52	13.0	1.97	7.63
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.41	1.29	1.07	8.32	84.9
Total Metals	Aluminum (Al)-Total (mg/L)	0.0056	0.0115			
	Antimony (Sb)-Total (mg/L)	0.00013	0.00013			
	Arsenic (As)-Total (mg/L)	0.00037	0.00038			
	Barium (Ba)-Total (mg/L)	0.292	0.308			
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.013	0.013			
	Cadmium (Cd)-Total (mg/L)	0.0000419	0.0000416			
	Calcium (Ca)-Total (mg/L)	38.0	31.8			
	Chromium (Cr)-Total (mg/L)	0.00011	0.00011			
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010			
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050			
	Iron (Fe)-Total (mg/L)	0.016	<0.010			
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Total (mg/L)	0.0099	0.0121			
	Magnesium (Mg)-Total (mg/L)	7.04	6.80			
	Manganese (Mn)-Total (mg/L)	0.00385	0.00043			
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050			

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

L2621328 CONTD.... PAGE 3 of 9

10-AUG-21 16:23 (MT) Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-6 Groundwater 27-JUL-21 12:00 E257242		
Grouping	Analyte			
WATER				
Physical Tests	Hardness (as CaCO3) (mg/L)	280		
	Temperature (Degree C)	20.5		
	Total Suspended Solids (mg/L)			
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	316		
	Ammonia as N (mg/L)	0.0517		
	Bicarbonate (HCO3) (mg/L)	385		
	Carbonate (CO3) (mg/L)	<5.0		
	Chloride (CI) (mg/L)	1.33		
	Conductivity (EC) (uS/cm)	509		
	Fluoride (F) (mg/L)	<0.020		
	Hydroxide (OH) (mg/L)	<5.0		
	Nitrate and Nitrite (as N) (mg/L)	0.0054		
	Nitrate (as N) (mg/L)	0.0054		
	Nitrite (as N) (mg/L)	<0.0010		
	pH (pH)	7.87		
	Orthophosphate-Dissolved (as P) (mg/L)	0.0015		
	Sulfate (SO4) (mg/L)	2.21		
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	5.45		
Total Metals	Aluminum (Al)-Total (mg/L)			
	Antimony (Sb)-Total (mg/L)			
	Arsenic (As)-Total (mg/L)			
	Barium (Ba)-Total (mg/L)			
	Beryllium (Be)-Total (mg/L)			
	Bismuth (Bi)-Total (mg/L)			
	Boron (B)-Total (mg/L)			
	Cadmium (Cd)-Total (mg/L)			
	Calcium (Ca)-Total (mg/L)			
	Chromium (Cr)-Total (mg/L)			
	Cobalt (Co)-Total (mg/L)			
	Copper (Cu)-Total (mg/L)			
	Iron (Fe)-Total (mg/L)			
	Lead (Pb)-Total (mg/L)			
	Lithium (Li)-Total (mg/L)			
	Magnesium (Mg)-Total (mg/L)			
	Manganese (Mn)-Total (mg/L)			
	Mercury (Hg)-Total (mg/L)			

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-1 Surface Water 27-JUL-21 12:00 E257246	L2621328-2 Surface Water 27-JUL-21 12:00 E257247	L2621328-3 Groundwater 27-JUL-21 12:00 E257238	L2621328-4 Groundwater 27-JUL-21 12:00 E257235	L2621328-5 Groundwater 27-JUL-21 12:00 E257239
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000624	0.000711			
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050			
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	0.77	0.86			
	Selenium (Se)-Total (mg/L)	0.000204	0.000258			
	Silicon (Si)-Total (mg/L)	2.33	1.86			
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Total (mg/L)	2.55	2.93			
	Strontium (Sr)-Total (mg/L)	0.131	0.126			
	Sulfur (S)-Total (mg/L)	1.69	1.64			
	Thallium (TI)-Total (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030			
	Uranium (U)-Total (mg/L)	0.000278	0.000240			
	Vanadium (V)-Total (mg/L)	0.00050	0.00051			
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030			
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030			
Dissolved Metals	Dissolved Mercury Filtration Location			FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location			FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)			<0.0010	0.0017	0.0247
	Antimony (Sb)-Dissolved (mg/L)			<0.00010	<0.00010	0.00015
	Arsenic (As)-Dissolved (mg/L)			0.00015	0.00451	0.00026
	Barium (Ba)-Dissolved (mg/L)			0.298	0.706	0.174
	Beryllium (Be)-Dissolved (mg/L)			<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)			<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)			0.023	0.038	0.022
	Cadmium (Cd)-Dissolved (mg/L)			0.0000431	0.000299	0.0000247
	Calcium (Ca)-Dissolved (mg/L)			84.0	80.3	47.3
	Chromium (Cr)-Dissolved (mg/L)			<0.00010	<0.00010	0.00013
	Cobalt (Co)-Dissolved (mg/L)			0.00014	0.00224	<0.00010
	Copper (Cu)-Dissolved (mg/L)			0.00051	0.00125	0.00421
	Iron (Fe)-Dissolved (mg/L)			<0.010	1.67	0.024
	Lead (Pb)-Dissolved (mg/L)			<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)			0.0083	0.0055	0.0109
	Magnesium (Mg)-Dissolved (mg/L)			19.6	11.0	7.17
	Manganese (Mn)-Dissolved (mg/L)			0.205	2.11	0.00175
	Mercury (Hg)-Dissolved (mg/L)			<0.0000050	<0.000050	<0.0000050

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-6 Groundwater 27-JUL-21 12:00 E257242		
Grouping	Analyte			
WATER				
Total Metals	Molybdenum (Mo)-Total (mg/L)			
	Nickel (Ni)-Total (mg/L)			
	Phosphorus (P)-Total (mg/L)			
	Potassium (K)-Total (mg/L)			
	Selenium (Se)-Total (mg/L)			
	Silicon (Si)-Total (mg/L)			
	Silver (Ag)-Total (mg/L)			
	Sodium (Na)-Total (mg/L)			
	Strontium (Sr)-Total (mg/L)			
	Sulfur (S)-Total (mg/L)			
	Thallium (TI)-Total (mg/L)			
	Tin (Sn)-Total (mg/L)			
	Titanium (Ti)-Total (mg/L)			
	Uranium (U)-Total (mg/L)			
	Vanadium (V)-Total (mg/L)			
	Zinc (Zn)-Total (mg/L)			
	Zirconium (Zr)-Total (mg/L)			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD		
	Dissolved Metals Filtration Location	FIELD		
	Aluminum (AI)-Dissolved (mg/L)	0.0022		
	Antimony (Sb)-Dissolved (mg/L)	0.00011		
	Arsenic (As)-Dissolved (mg/L)	0.00075		
	Barium (Ba)-Dissolved (mg/L)	0.520		
	Beryllium (Be)-Dissolved (mg/L)	<0.000020		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050		
	Boron (B)-Dissolved (mg/L)	0.043		
	Cadmium (Cd)-Dissolved (mg/L)	0.000785		
	Calcium (Ca)-Dissolved (mg/L)	92.5		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	0.00380		
	Copper (Cu)-Dissolved (mg/L)	0.00098		
	Iron (Fe)-Dissolved (mg/L)	0.257		
	Lead (Pb)-Dissolved (mg/L)	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.0049		
	Magnesium (Mg)-Dissolved (mg/L)	11.8		
	Manganese (Mn)-Dissolved (mg/L)	1.40		
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-1 Surface Water 27-JUL-21 12:00 E257246	L2621328-2 Surface Water 27-JUL-21 12:00 E257247	L2621328-3 Groundwater 27-JUL-21 12:00 E257238	L2621328-4 Groundwater 27-JUL-21 12:00 E257235	L2621328-5 Groundwater 27-JUL-21 12:00 E257239
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)			0.00117	0.00110	0.00101
	Nickel (Ni)-Dissolved (mg/L)			0.00113	0.00355	0.00112
	Phosphorus (P)-Dissolved (mg/L)			<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)			1.36	1.89	1.03
	Selenium (Se)-Dissolved (mg/L)			<0.000050	0.000108	0.000232
	Silicon (Si)-Dissolved (mg/L)			5.21	4.97	3.47
	Silver (Ag)-Dissolved (mg/L)			<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)			4.67	3.97	5.34
	Strontium (Sr)-Dissolved (mg/L)			0.291	0.295	0.479
	Sulfur (S)-Dissolved (mg/L)			5.11	1.11	3.06
	Thallium (TI)-Dissolved (mg/L)			0.000016	0.000112	<0.000010
	Tin (Sn)-Dissolved (mg/L)			<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)			<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)			0.00141	0.000390	0.000228
	Vanadium (V)-Dissolved (mg/L)			<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)			0.0014	0.0038	0.0020
	Zirconium (Zr)-Dissolved (mg/L)		Bua	<0.00030	<0.00030	<0.00030
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0 PHA	<2.0	3.5	<6.0 DLM
	Chemical Oxygen Demand (mg/L)	<10	<10	<10	40	377

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2621328-6 Groundwater 27-JUL-21 12:00 E257242		
Grouping	Analyte			
WATER				
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)	0.000454		
	Nickel (Ni)-Dissolved (mg/L)	0.00758		
	Phosphorus (P)-Dissolved (mg/L)	<0.050		
	Potassium (K)-Dissolved (mg/L)	1.67		
	Selenium (Se)-Dissolved (mg/L)	0.000066		
	Silicon (Si)-Dissolved (mg/L)	4.27		
	Silver (Ag)-Dissolved (mg/L)	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	2.85		
	Strontium (Sr)-Dissolved (mg/L)	0.368		
	Sulfur (S)-Dissolved (mg/L)	1.01		
	Thallium (TI)-Dissolved (mg/L)	0.000076		
	Tin (Sn)-Dissolved (mg/L)	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.00030		
	Uranium (U)-Dissolved (mg/L)	0.000770		
	Vanadium (V)-Dissolved (mg/L)	<0.00050		
	Zinc (Zn)-Dissolved (mg/L)	0.0071		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030		
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0		
	Chemical Oxygen Demand (mg/L)	21		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

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Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
PHA	pH Adjusted Before Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BE-D-L-CCMS-CL	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-CL Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

Water APHA 5310 TOTAL ORGANIC CARBON (TOC) C-TOT-ORG-LOW-CL **Total Organic Carbon**

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-L-IC-N-CL Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry

Samples are analyzed using the closed reflux colourimetric method

F-L-IC-CL Fluoride Water APHA 4110 B-Ion Chromatography

HARDNESS-CALC-CL Water Hardness **APHA 2340 B**

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents,

Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

Dissolved Mercury in Water by CVAAS APHA 3030B/EPA 1631E (mod) HG-D-CVAA-CL

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction

with stannous chloride, and analyzed by CVAAS.

HG-T-CVAA-CL Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Total Metals in Water by CRC ICPMS MET-T-CCMS-CL Water EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

Reference Information

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This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH/EC/ALK-CL Water pH, Conductivity and Total Alkalinity APHA 4500H,2510,2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.

Alkalinity measurement is based on the sample's capacity to neutralize acid

Conductivity measurement is based on the sample's capacity to convey an electric current

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-L-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TEMP-CLWaterTemperatureAPHA 2550-ThermometerTSS-L-CLWaterTotal Suspended SolidsAPHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour 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.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L2621328 Report Date: 10-AUG-21 Page 1 of 10

Client: Sperling Hansen Associates Inc.

#8 - 1225 East Keith Road North Vancouver BC V7J 1J3

Contact: Scott Garthwaite

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BE-D-L-CCMS-CL	Water							
Batch R5546923 WG3593345-2 LCS		TMRM						
Beryllium (Be)-Dissolved	d	HIVIKIVI	96.0		%		80-120	09-AUG-21
WG3593345-1 MB Beryllium (Be)-Dissolved	d		<0.000020	0	mg/L		0.00002	09-AUG-21
BE-T-L-CCMS-CL	Water							
Batch R5546630 WG3591679-6 LCS Beryllium (Be)-Total		TMRM	101.7		%		80-120	10-AUG-21
WG3591679-5 MB Beryllium (Be)-Total			<0.00002	0	mg/L		0.00002	09-AUG-21
BOD-BC-CL	Water							
Batch R5544496								
WG3590486-2 LCS Biochemical Oxygen De	mand		97.9		%		85-115	31-JUL-21
WG3590486-1 MB Biochemical Oxygen De	mand		<2.0		mg/L		2	31-JUL-21
C-TOT-ORG-LOW-CL	Water							
Batch R5541516		1 000 1000 1						
WG3589411-8 DUP Total Organic Carbon		L2621328-1 1.41	1.22		mg/L	14	20	03-AUG-21
WG3589411-2 LCS Total Organic Carbon			101.9		%		80-120	03-AUG-21
WG3589411-6 LCS Total Organic Carbon			100.8		%		80-120	03-AUG-21
WG3589411-1 MB Total Organic Carbon			<0.50		mg/L		0.5	03-AUG-21
WG3589411-5 MB Total Organic Carbon			<0.50		mg/L		0.5	03-AUG-21
WG3589411-7 MS Total Organic Carbon		L2621328-1	99.9		%		70-130	03-AUG-21
CL-L-IC-N-CL	Water							
Batch R5544557								
WG3590662-6 LCS Chloride (CI)			99.3		%		85-115	31-JUL-21
WG3590662-5 MB Chloride (CI)			<0.10		mg/L		0.1	31-JUL-21
COD-T-COL-CL	Water							



Workorder: L2621328 Report Date: 10-AUG-21 Page 2 of 10

Test	Matrix	Reference	Result Qu	ıalifier	Units	RPD	Limit	Analyzed
COD-T-COL-CL	Water							
Batch R5545771								
WG3591304-6 LCS Chemical Oxygen Dema	nd		101.8		%		05.445	05 4110 04
WG3591304-5 MB	nu		101.6		70		85-115	05-AUG-21
Chemical Oxygen Dema	nd		<10		mg/L		10	05-AUG-21
F-L-IC-CL	Water							
Batch R5544557								
WG3590662-6 LCS			04.0		%		05.445	
Fluoride (F)			91.8		%		85-115	31-JUL-21
WG3590662-5 MB Fluoride (F)			<0.020		mg/L		0.02	31-JUL-21
	Water				3		0.02	0100221
HG-D-CVAA-CL	water							
Batch R5546057 WG3592354-7 DUP		L2621328-6						
Mercury (Hg)-Dissolved		< 0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-AUG-21
WG3592354-6 LCS								
Mercury (Hg)-Dissolved			89.1		%		80-120	07-AUG-21
WG3592354-5 MB								
Mercury (Hg)-Dissolved			<0.0000050		mg/L		0.000005	07-AUG-21
WG3592354-8 MS Mercury (Hg)-Dissolved		L2621328-6	93.5		%		70-130	07-AUG-21
			30.0		70		70-130	07-A0G-21
HG-T-CVAA-CL	Water							
Batch R5546057 WG3592358-6 LCS								
Mercury (Hg)-Total			107.0		%		80-120	07-AUG-21
WG3592358-5 MB							-	
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	07-AUG-21
MET-D-CCMS-CL	Water							
Batch R5546923								
WG3593345-2 LCS		TMRM						
Aluminum (AI)-Dissolved			100.2		%		80-120	09-AUG-21
Antimony (Sb)-Dissolved			99.6		%		80-120	09-AUG-21
Arsenic (As)-Dissolved			99.4		%		80-120	09-AUG-21
Barium (Ba)-Dissolved			104.2		%		80-120	09-AUG-21
Bismuth (Bi)-Dissolved			100.6		%		80-120	09-AUG-21
Boron (B)-Dissolved			91.4		%		80-120	09-AUG-21
Cadmium (Cd)-Dissolved	t		97.1		%		80-120	09-AUG-21
Calcium (Ca)-Dissolved			97.5		%		80-120	09-AUG-21



Workorder: L2621328 Report Date: 10-AUG-21 Page 3 of 10

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R5546923								
WG3593345-2 LCS		TMRM						
Chromium (Cr)-Dissolved			98.8		%		80-120	09-AUG-21
Cobalt (Co)-Dissolved			97.8		%		80-120	09-AUG-21
Copper (Cu)-Dissolved			95.4		%		80-120	09-AUG-21
Iron (Fe)-Dissolved			101.7		%		80-120	09-AUG-21
Lead (Pb)-Dissolved			99.4		%		80-120	09-AUG-21
Lithium (Li)-Dissolved			99.8		%		80-120	09-AUG-21
Magnesium (Mg)-Dissolve			99.1		%		80-120	09-AUG-21
Manganese (Mn)-Dissolve			98.6		%		80-120	09-AUG-21
Molybdenum (Mo)-Dissolv	/ed		103.8		%		80-120	09-AUG-21
Nickel (Ni)-Dissolved			96.7		%		80-120	09-AUG-21
Phosphorus (P)-Dissolved	t		102.6		%		70-130	09-AUG-21
Potassium (K)-Dissolved			98.2		%		80-120	09-AUG-21
Selenium (Se)-Dissolved			95.9		%		80-120	09-AUG-21
Silicon (Si)-Dissolved			102.1		%		60-140	09-AUG-21
Silver (Ag)-Dissolved			98.5		%		80-120	09-AUG-21
Sodium (Na)-Dissolved			97.9		%		80-120	09-AUG-21
Strontium (Sr)-Dissolved			106.8		%		80-120	09-AUG-21
Sulfur (S)-Dissolved			97.0		%		80-120	09-AUG-21
Thallium (TI)-Dissolved			99.3		%		80-120	09-AUG-21
Tin (Sn)-Dissolved			100.8		%		80-120	09-AUG-21
Titanium (Ti)-Dissolved			95.8		%		80-120	09-AUG-21
Uranium (U)-Dissolved			95.8		%		80-120	09-AUG-21
Vanadium (V)-Dissolved			99.5		%		80-120	09-AUG-21
Zinc (Zn)-Dissolved			97.1		%		80-120	09-AUG-21
Zirconium (Zr)-Dissolved			104.9		%		80-120	09-AUG-21
WG3593345-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	09-AUG-21
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	09-AUG-21
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	09-AUG-21
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	09-AUG-21
Bismuth (Bi)-Dissolved			<0.000050)	mg/L		0.00005	09-AUG-21
Boron (B)-Dissolved			<0.010		mg/L		0.01	09-AUG-21
Cadmium (Cd)-Dissolved			<0.000005	iC .	mg/L		0.000005	09-AUG-21
Calcium (Ca)-Dissolved			< 0.050		mg/L		0.05	09-AUG-21



Workorder: L2621328 Report Date: 10-AUG-21 Page 4 of 10

Test Mat	rix Reference	Result Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL Wa	ter					
Batch R5546923						
WG3593345-1 MB		0.00040	4			
Chromium (Cr)-Dissolved		<0.00010	mg/L		0.0001	09-AUG-21
Cobalt (Co)-Dissolved		<0.00010	mg/L		0.0001	09-AUG-21
Copper (Cu)-Dissolved		<0.00020	mg/L		0.0002	09-AUG-21
Iron (Fe)-Dissolved		<0.010	mg/L		0.01	09-AUG-21
Lead (Pb)-Dissolved		<0.000050	mg/L		0.00005	09-AUG-21
Lithium (Li)-Dissolved		<0.0010	mg/L		0.001	09-AUG-21
Magnesium (Mg)-Dissolved		<0.0050	mg/L		0.005	09-AUG-21
Manganese (Mn)-Dissolved		<0.00010	mg/L		0.0001	09-AUG-21
Molybdenum (Mo)-Dissolved		<0.000050	mg/L		0.00005	09-AUG-21
Nickel (Ni)-Dissolved		<0.00050	mg/L		0.0005	09-AUG-21
Phosphorus (P)-Dissolved		<0.050	mg/L		0.05	09-AUG-21
Potassium (K)-Dissolved		<0.050	mg/L		0.05	09-AUG-21
Selenium (Se)-Dissolved		<0.000050	mg/L		0.00005	09-AUG-21
Silicon (Si)-Dissolved		<0.050	mg/L		0.05	09-AUG-21
Silver (Ag)-Dissolved		<0.000010	mg/L		0.00001	09-AUG-21
Sodium (Na)-Dissolved		<0.050	mg/L		0.05	09-AUG-21
Strontium (Sr)-Dissolved		<0.00020	mg/L		0.0002	09-AUG-21
Sulfur (S)-Dissolved		<0.50	mg/L		0.5	09-AUG-21
Thallium (TI)-Dissolved		<0.000010	mg/L		0.00001	09-AUG-21
Tin (Sn)-Dissolved		<0.00010	mg/L		0.0001	09-AUG-21
Titanium (Ti)-Dissolved		<0.00030	mg/L		0.0003	09-AUG-21
Uranium (U)-Dissolved		<0.000010	mg/L		0.00001	09-AUG-21
Vanadium (V)-Dissolved		<0.00050	mg/L		0.0005	09-AUG-21
Zinc (Zn)-Dissolved		<0.0010	mg/L		0.001	09-AUG-21
Zirconium (Zr)-Dissolved		<0.00020	mg/L		0.0002	09-AUG-21
MET-T-CCMS-CL Wa	ter					
Batch R5546630						
WG3591679-6 LCS	TMRM					
Aluminum (Al)-Total		102.9	%		80-120	09-AUG-21
Antimony (Sb)-Total		100.9	%		80-120	09-AUG-21
Arsenic (As)-Total		105.4	%		80-120	09-AUG-21
Barium (Ba)-Total		110.2	%		80-120	09-AUG-21
Bismuth (Bi)-Total		98.8	%		80-120	09-AUG-21
Boron (B)-Total		95.3	%		80-120	09-AUG-21



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Test Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5546630								
WG3591679-6 LCS		TMRM	10E 0		0/		00.400	00 4110 04
Cadmium (Cd)-Total			105.8 103.1		% %		80-120	09-AUG-21
Calcium (Ca)-Total			105.1		%		80-120	09-AUG-21
Chromium (Cr)-Total			105.4				80-120	09-AUG-21
Cobalt (Co)-Total					%		80-120	09-AUG-21
Copper (Cu)-Total			102.4		%		80-120	09-AUG-21
Iron (Fe)-Total			108.5		%		80-120	09-AUG-21
Lead (Pb)-Total			100.5		%		80-120	09-AUG-21
Lithium (Li)-Total			102.0		%		80-120	09-AUG-21
Magnesium (Mg)-Total			101.3		%		80-120	09-AUG-21
Manganese (Mn)-Total			104.6		%		80-120	09-AUG-21
Molybdenum (Mo)-Total			99.9		%		80-120	09-AUG-21
Nickel (Ni)-Total			102.9		%		80-120	09-AUG-21
Phosphorus (P)-Total			105.4		%		70-130	09-AUG-21
Potassium (K)-Total			107.1		%		80-120	09-AUG-21
Selenium (Se)-Total			116.9		%		80-120	09-AUG-21
Silicon (Si)-Total			124.0		%		60-140	09-AUG-21
Silver (Ag)-Total			96.9		%		80-120	09-AUG-21
Sodium (Na)-Total			104.7		%		80-120	09-AUG-21
Strontium (Sr)-Total			103.0		%		80-120	09-AUG-21
Sulfur (S)-Total			102.7		%		80-120	09-AUG-21
Thallium (TI)-Total			98.7		%		80-120	09-AUG-21
Tin (Sn)-Total			104.0		%		80-120	09-AUG-21
Titanium (Ti)-Total			104.3		%		80-120	09-AUG-21
Uranium (U)-Total			95.7		%		80-120	09-AUG-21
Vanadium (V)-Total			100.8		%		80-120	09-AUG-21
Zinc (Zn)-Total			102.3		%		80-120	09-AUG-21
Zirconium (Zr)-Total			99.5		%		80-120	09-AUG-21
WG3591679-5 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	09-AUG-21
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Barium (Ba)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Bismuth (Bi)-Total			<0.00005	0	mg/L		0.00005	09-AUG-21
Boron (B)-Total			<0.010		mg/L		0.01	09-AUG-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5546630 WG3591679-5 MB								
Cadmium (Cd)-Total			<0.000005	С	mg/L		0.000005	09-AUG-21
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-AUG-21
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-AUG-21
Iron (Fe)-Total			<0.010		mg/L		0.01	09-AUG-21
Lead (Pb)-Total			<0.000050	ı	mg/L		0.00005	09-AUG-21
Lithium (Li)-Total			<0.0010		mg/L		0.001	09-AUG-21
Magnesium (Mg)-Total			< 0.0050		mg/L		0.005	09-AUG-21
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Molybdenum (Mo)-Total			<0.000050	1	mg/L		0.00005	09-AUG-21
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-AUG-21
Phosphorus (P)-Total			< 0.050		mg/L		0.05	09-AUG-21
Potassium (K)-Total			< 0.050		mg/L		0.05	09-AUG-21
Selenium (Se)-Total			<0.000050	1	mg/L		0.00005	09-AUG-21
Silicon (Si)-Total			< 0.050		mg/L		0.05	09-AUG-21
Silver (Ag)-Total			<0.000010	1	mg/L		0.00001	09-AUG-21
Sodium (Na)-Total			< 0.050		mg/L		0.05	09-AUG-21
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	09-AUG-21
Sulfur (S)-Total			<0.50		mg/L		0.5	09-AUG-21
Thallium (TI)-Total			<0.000010	1	mg/L		0.00001	09-AUG-21
Tin (Sn)-Total			<0.00010		mg/L		0.0001	09-AUG-21
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	09-AUG-21
Uranium (U)-Total			<0.000010	1	mg/L		0.00001	09-AUG-21
Vanadium (V)-Total			<0.00050		mg/L		0.0005	09-AUG-21
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-AUG-21
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	09-AUG-21
NH3-L-F-CL	Water							
Batch R5543745								
WG3589917-6 LCS Ammonia as N			108.7		%		85-115	03-AUG-21
WG3589917-5 MB Ammonia as N			<0.0050		mg/L		0.005	03-AUG-21
NO2-L-IC-N-CL	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-CL	Water							
Batch R554	14557							
	LCS		00.0		0/			
Nitrite (as N)			99.8		%		90-110	31-JUL-21
WG3590662-5 I Nitrite (as N)	MB		<0.0010		mg/L		0.001	31-JUL-21
NO3-L-IC-N-CL	Water							
Batch R554	14557							
WG3590662-6 INitrate (as N)	LCS		99.4		%		90-110	31-JUL-21
WG3590662-5 Nitrate (as N)	МВ		<0.0050		mg/L		0.005	31-JUL-21
PH/EC/ALK-CL	Water							
Batch R554	16843							
	DUP	L2621328-6						
pH		7.87	7.93	J	pН	0.06	0.2	07-AUG-21
Conductivity (EC)		509	507		uS/cm	0.4	10	07-AUG-21
Bicarbonate (HCC		385	373		mg/L	3.0	20	07-AUG-21
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	20	07-AUG-21
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	20	07-AUG-21
Alkalinity, Total (a	s CaCO3)	316	306		mg/L	3.0	20	07-AUG-21
WG3593251-5 I Conductivity (EC)	LCS		102.2		%		90-110	07-AUG-21
Alkalinity, Total (a	s CaCO3)		103.6		%		85-115	07-AUG-21
WG3593251-8	LCS							
Conductivity (EC)			103.4		%		90-110	07-AUG-21
Alkalinity, Total (a	s CaCO3)		107.0		%		85-115	07-AUG-21
WG3593251-4 I Conductivity (EC)	МВ		<2.0		uS/cm		2	07 1110 04
Bicarbonate (HCC			<5.0		mg/L		2 5	07-AUG-21 07-AUG-21
Carbonate (CO3)	,		<5.0		mg/L			
Hydroxide (OH)			<5.0		mg/L		5 5	07-AUG-21
Alkalinity, Total (a	s CaCO3)		<2.0		mg/L		2	07-AUG-21 07-AUG-21
	MB		72.0		mg/ =		4	U1-AUG-21
Conductivity (EC)			<2.0		uS/cm		2	07-AUG-21
Bicarbonate (HCC			<5.0		mg/L		5	07-AUG-21
Carbonate (CO3)			<5.0		mg/L		5	07-AUG-21
Hydroxide (OH)			<5.0		mg/L		5	07-AUG-21
Alkalinity, Total (a	s CaCO3)		<2.0		mg/L		2	07-AUG-21



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					•			3
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-L-COL-CL	Water							
Batch R55383	59							
WG3588434-3 DU		L2621328-1						
Orthophosphate-Diss	solved (as P)	0.0061	0.0066		mg/L	7.8	20	01-AUG-21
WG3588434-2 LCS								
Orthophosphate-Diss	solved (as P)		91.1		%		80-120	01-AUG-21
WG3588434-1 MB								
Orthophosphate-Diss	solved (as P)		<0.0010		mg/L		0.001	01-AUG-21
WG3588434-4 MS		L2621328-2						
Orthophosphate-Diss	solved (as P)		102.7		%		70-130	01-AUG-21
SO4-L-IC-N-CL	Water							
Batch R55445	57							
WG3590662-6 LCS	3							
Sulfate (SO4)			98.6		%		85-115	31-JUL-21
WG3590662-5 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	31-JUL-21
TEMP-CL	Water							
Batch R55468	43							
WG3593251-9 DU	P	L2621328-6						
Temperature		20.5	20.5		Degree C	0.0	25	07-AUG-21
TSS-L-CL	Water							
Batch R55446	49							
WG3588650-2 LCS	-							
Total Suspended Sol			97.2		%		85-115	03-AUG-21
WG3588650-1 MB								
Total Suspended Sol			<1.0		mg/L		1	03-AUG-21

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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Hold Time Exceedances:

	Sample						
ALS Product Description	ID [.]	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrate in Water by IC (Low	/ Level)						
	1	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	2	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	3	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	4	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	5	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	6	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
Nitrite in Water by IC (Low	Level)						
	1	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	2	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	3	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	4	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	5	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
	6	27-JUL-21 12:00	31-JUL-21 10:48	3	4	days	EHTR
Orthophosphate-Dissolved	(as P)						
	1	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR
	2	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR
	3	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR
	4	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR
	5	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR
	6	27-JUL-21 12:00	01-AUG-21 08:00	3	5	days	EHTR

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2621328 were received on 30-JUL-21 12:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

0 668 9878

	NUMBER
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ALU/	www.alsglobal.com			Danarks / Recipients	inionts				Turns	Turnaround Time (TAT) Requested	Time	(TAT)	Reque	sted											
Report To	Contact and company name below will appear on the final report			1	-		Routine [R] If received by 3pm M-F-	[2] f	ceived	ву Зрт	목무	no surcharges apply	harges	apply	d										
	Sperling Hansen Associates Inc.		Select Report Format:		AEK	_H2	4 day [P4] if received by 3pm M-F-	P4] if re	celved b	y 3pm	M-F - :	20% rush surcharge minimum	sh surch	n agra	ninimur	_									1
	Scott Garthwaite		Merge QC/QC) Reports with COA	eports with COA L	and datalic halow if box	v chacked	3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum	[P3] If r	eceived	by 3pm	M-F -	25% ru	sh surc	harge i	minimu	3		Þ	AFFIX ALS BARCOUR LABEL TICKE (ALS use only)	(AI	(ALS use only)	e on	₹₽	-	, i
	778-471-7088		Compare Results	Compare Results to Criteria on Reput: MAII. FAX	MAIL FAX		2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum	[P2] if 1	ceived	by 3pm	M-F-	20% דר	sh surc	harge	minimu	3 3		ħ							
	Company address below will appear on the final report		Ιō			H	1 day [E] if received by 3pm M-F - 100% rush surcharge minimum came day [E2] if received by 10am M-S - 200% rush surcharge. Ad	E If re	ielvea u	y 3pm	M-H- 1	00% ru	10% rus	indrye :	harge.	Additio	nal fee	- T							
Street:	1225 East Keith Road		or Fax	sgarnWaite@spellinghallsch.com	ndilsen.com		may apply to rush requests on weekends, statutory holidays and non-routine today	ply to n	ish requ	ests on	weeker	ds, stat	utory h	olidays	and no	n-rout	ne tes	N							
ovince:	North Vancouver, B.C.			chemerington@spellingilansen.com	ignansen.com			ate and	Date and Time Required for all E&P TATs:	quired	for all	E&P 7/A	S:	4	1		18	2-(1)(1)	ту		the name n	TI STORY	_		
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	Same as Report To	NO		Z III		nav	1	1		1	1	1		Anal	Analysis Request	equ	180								
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Company.			Email 2				Т	1	+	+	+	+	+	+	1			1	1	+	+				ΣUI
Contract	Project Information		lio	Oil and Gas Required Fields (client use)	Fields (client use)			y, pl	_	_	_		_									_	D.		REC
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ALS Lab Wor	ALS Lab Work Order # (ALS use only):		ALS Contact:	Dean Watt	Sampler: T	TM	IBEI	, temp	Ikalinit		ved Me	/letals	nia	, nitrite		hosph	ie, chlo		_				MPL		END
ALS Sample #	Sample Identification and/or Coordinates	and/or Coordinates		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	-	Anion	\vdash	TSS	\vdash	Total	Amm	nitrate	тос	crtho	fluori	COD	+	+	+	_	SA		EY.
ALS use omy)	+	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		12-40-42	1	Surface Water	7	20	R	20	_	R	R	70	Z	Z	Z	7	+	+	-			- 1	
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Urinki	, dach	Battich Columbia Contaminated Sites Regulation Stage 10 Amendment (NOV, 2017)	nated Sites Regula	ation Stage 10 Amen	dment (NOV, 2017)		Submission Comments identified on Sample Receipt Notification:	ission	Comm	ients i	dentifi	ed on	Samp	le Re	ceipt	Notific	cation	4			Ę		S		
Are samples tak	Regulated DW System?	British Columbia Approved and Working Water Quality Guidelines (MAY, 2015)	d and Working Wa	ter Quality Guideline	is (MAY, 2015)		Coole	r Cust	Cooler Custody Seals Intact:	als in	lact:		4	YES	NA	Sam	ple C	70	Sample Custody Seals Intact:	als Int	tact:	Tradi	PE	ol .	្សិក្សិ
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Are samples for	Are samples for human consumption/ use?						0	_					- 1	H					-		L				
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Deliana hu	SHIPMENT RELEASE (client use)	Time:	Received by:		Date:	7	Time:	*	Rec	Received by:	Υ.				Date:	99							THIE .		Ĭ.
Released by:	Late:			1111			7	7	7	-					i								sil.	ſ	

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 Confidence of the samples are taken from a Regulated Drinking Water (DW). System, please submit using an Authorized DW COC form.

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



Sperling Hansen Associates Inc.

ATTN: Scott Garthwaite #8 - 1225 East Keith Road North Vancouver BC V7J 1J3 Date Received: 16-NOV-21

Report Date: 25-NOV-21 16:41 (MT)

Version: FINAL

Client Phone: 604-986-7723

Certificate of Analysis

Lab Work Order #: L2663287

Project P.O. #:

NOT SUBMITTED

Job Reference:

20050 FERNIE

C of C Numbers: Legal Site Desc:

Probab Migh

Patryk Wojciak, B.Sc., P.Chem. Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298 ALS CANADA LTD Part of the ALS Group An ALS Limited Company



L2663287 CONTD....

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Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2663287-1 Surface Water 11-NOV-21 12:00 E257246	L2663287-2 Groundwater 11-NOV-21 12:00 E257244	L2663287-3 Surface Water 11-NOV-21 12:00 E257247	L2663287-4 Groundwater 11-NOV-21 12:00 E257237	L2663287-5 Groundwater 11-NOV-21 12:00 E257235
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 76.4	262	нтс 46.9	356	225
	Temperature (Degree C)	20.7	20.7	20.9	21.0	21.3
	Total Suspended Solids (mg/L)	<1.0		1.8		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	89.9	223	53.0	379	261
	Ammonia as N (mg/L)	0.0109	0.0261	0.0385	0.0233	0.352
	Bicarbonate (HCO3) (mg/L)	110	271	64.7	463	318
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Chloride (CI) (mg/L)	0.75	45.0	0.19	3.53	0.99
	Conductivity (EC) (uS/cm)	156	543	97.4	694	450
	Fluoride (F) (mg/L)	0.044	0.066	0.039	0.039	0.032
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	<5.0
	Nitrate and Nitrite (as N) (mg/L)	0.0195	0.0103	0.0439	3.58	0.0080
	Nitrate (as N) (mg/L)	0.0195	0.0103	0.0439	3.58	0.0070
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	0.0011	0.0010
	pH (pH)	7.67	7.34	7.70	7.23	7.50
	Orthophosphate-Dissolved (as P) (mg/L)	0.0068	0.0058	0.0115	0.0108	0.0015
	Sulfate (SO4) (mg/L)	3.39	14.8	2.81	18.6	4.22
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	5.00	9.2	5.58	6.3	15.7
Total Metals	Aluminum (Al)-Total (mg/L)	0.0373		0.157		
	Antimony (Sb)-Total (mg/L)	0.00013		0.00011		
	Arsenic (As)-Total (mg/L)	0.00022		0.00024		
	Barium (Ba)-Total (mg/L)	0.146		0.138		
	Beryllium (Be)-Total (mg/L)	<0.000020		<0.000020		
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.0000274		0.0000453		
	Calcium (Ca)-Total (mg/L)	23.6		13.5		
	Chromium (Cr)-Total (mg/L)	<0.00010		0.00027		
	Cobalt (Co)-Total (mg/L)	<0.00010		<0.00010		
	Copper (Cu)-Total (mg/L)	0.00098		0.00077		
	Iron (Fe)-Total (mg/L)	0.042		0.143		
	Lead (Pb)-Total (mg/L)	<0.000050		0.000103		
	Lithium (Li)-Total (mg/L)	0.0049		0.0050		
	Magnesium (Mg)-Total (mg/L)	4.25		3.23		
	Manganese (Mn)-Total (mg/L)	0.00986		0.00306		
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.000050		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2663287-6 Surface Water 11-NOV-21 12:00 E257250	L2663287-7 Groundwater 11-NOV-21 12:00 E257239	L2663287-8 Surface Water 11-NOV-21 12:00 E257245	L2663287-9 Groundwater 11-NOV-21 12:00 E257242	
Grouping	Analyte					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	нтс 104	147	нтс 56.7	326	
	Temperature (Degree C)	21.7	21.1	21.2	21.5	
	Total Suspended Solids (mg/L)	1.7		1.4		
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	115	168	64.3	369	
	Ammonia as N (mg/L)	0.0059	<0.0050	0.0064	0.0733	
	Bicarbonate (HCO3) (mg/L)	140	205	78.4	451	
	Carbonate (CO3) (mg/L)	<5.0	<5.0	<5.0	<5.0	
	Chloride (CI) (mg/L)	0.41	0.55	0.23	1.93	
	Conductivity (EC) (uS/cm)	205	299	119	622	
	Fluoride (F) (mg/L)	0.037	0.039	0.033	0.032	
	Hydroxide (OH) (mg/L)	<5.0	<5.0	<5.0	<5.0	
	Nitrate and Nitrite (as N) (mg/L)	0.0216	0.105	0.0610	0.0123	
	Nitrate (as N) (mg/L)	0.0216	0.105	0.0610	0.0123	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	pH (pH)	8.12	7.54	7.83	7.41	
	Orthophosphate-Dissolved (as P) (mg/L)	0.0149	0.0070	0.0123	0.0013	
	Sulfate (SO4) (mg/L)	3.12	5.91	2.71	3.42	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	8.06	11.4	6.45	8.1	
Total Metals	Aluminum (Al)-Total (mg/L)	0.889		0.419		
	Antimony (Sb)-Total (mg/L)	0.00011		<0.00010		
	Arsenic (As)-Total (mg/L)	0.00061		0.00034		
	Barium (Ba)-Total (mg/L)	0.136		0.0976		
	Beryllium (Be)-Total (mg/L)	0.000044		0.000024		
	Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		
	Boron (B)-Total (mg/L)	<0.010		<0.010		
	Cadmium (Cd)-Total (mg/L)	0.0000314		0.0000126		
	Calcium (Ca)-Total (mg/L)	33.8		19.0		
	Chromium (Cr)-Total (mg/L)	0.00072		0.00046		
	Cobalt (Co)-Total (mg/L)	0.00017		0.00011		
	Copper (Cu)-Total (mg/L)	0.00120		0.00218		
	Iron (Fe)-Total (mg/L)	0.680		0.299		
	Lead (Pb)-Total (mg/L)	0.000371		0.000210		
	Lithium (Li)-Total (mg/L)	0.0032		0.0027		
	Magnesium (Mg)-Total (mg/L)	4.74		2.24		
	Manganese (Mn)-Total (mg/L)	0.0118		0.00334		
	Mercury (Hg)-Total (mg/L)	<0.0000050		<0.000050		

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

Version:

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< 0.0000050

< 0.0000050

ALS ENVIRONMENTAL ANALYTICAL REPORT

L2663287-1 L2663287-2 L2663287-3 L2663287-4 L2663287-5 Sample ID Description Surface Water Groundwater Surface Water Groundwater Groundwater 11-NOV-21 Sampled Date 11-NOV-21 11-NOV-21 11-NOV-21 11-NOV-21 Sampled Time 12:00 12:00 12:00 12:00 12:00 E257246 E257244 E257247 E257237 E257235 Client ID Grouping **Analyte WATER** Molybdenum (Mo)-Total (mg/L) **Total Metals** 0.000423 0.000343 Nickel (Ni)-Total (mg/L) 0.00062 0.00069 Phosphorus (P)-Total (mg/L) < 0.050 < 0.050 Potassium (K)-Total (mg/L) 0.51 0.45 Selenium (Se)-Total (mg/L) 0.000403 0.000502 Silicon (Si)-Total (mg/L) 1.91 2.01 Silver (Ag)-Total (mg/L) 0.000012 < 0.000010 Sodium (Na)-Total (mg/L) 1.35 1.01 Strontium (Sr)-Total (mg/L) 0.0794 0.0559 Sulfur (S)-Total (mg/L) 1.49 1.21 Thallium (TI)-Total (mg/L) < 0.000010 < 0.000010 Tin (Sn)-Total (mg/L) < 0.00010 < 0.00010 Titanium (Ti)-Total (mg/L) 0.00036 0.00156 Uranium (U)-Total (mg/L) 0.000167 0.000099 Vanadium (V)-Total (mg/L) < 0.00050 0.00087 Zinc (Zn)-Total (mg/L) < 0.0030 < 0.0030 Zirconium (Zr)-Total (mg/L) < 0.00030 < 0.00030 **Dissolved Metals** Dissolved Mercury Filtration Location **FIELD FIELD FIELD** Dissolved Metals Filtration Location **FIELD FIELD FIELD** Aluminum (Al)-Dissolved (mg/L) 0.0011 0.0013 < 0.0010 Antimony (Sb)-Dissolved (mg/L) 0.00023 0.00013 < 0.00010 Arsenic (As)-Dissolved (mg/L) 0.00012 0.00023 0.00406 Barium (Ba)-Dissolved (mg/L) 0.226 0.148 0.650 Beryllium (Be)-Dissolved (mg/L) < 0.000020 < 0.000020 < 0.000020 Bismuth (Bi)-Dissolved (mg/L) < 0.000050 < 0.000050 < 0.000050 Boron (B)-Dissolved (mg/L) 0.035 0.132 0.036 Cadmium (Cd)-Dissolved (mg/L) 0.0000516 0.0000807 0.000359 Calcium (Ca)-Dissolved (mg/L) 76.3 74.4 117 Chromium (Cr)-Dissolved (mg/L) <0.00010 0.00011 < 0.00010 Cobalt (Co)-Dissolved (mg/L) < 0.00010 0.00015 0.00194 Copper (Cu)-Dissolved (mg/L) 0.00052 0.00154 0.00120 Iron (Fe)-Dissolved (mg/L) 1.09 < 0.010 < 0.010 Lead (Pb)-Dissolved (mg/L) < 0.000050 < 0.000050 < 0.000050 Lithium (Li)-Dissolved (mg/L) 0.0159 0.0041 0.0055 Magnesium (Mg)-Dissolved (mg/L) 17.4 15.7 9.47 Manganese (Mn)-Dissolved (mg/L) 0.00036 0.00127 1.74 Mercury (Hg)-Dissolved (mg/L)

< 0.0000050

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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	Sample ID Description Sampled Date Sampled Time Client ID	L2663287-6 Surface Water 11-NOV-21 12:00 E257250	L2663287-7 Groundwater 11-NOV-21 12:00 E257239	L2663287-8 Surface Water 11-NOV-21 12:00 E257245	L2663287-9 Groundwater 11-NOV-21 12:00 E257242	
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000609		0.000256		
	Nickel (Ni)-Total (mg/L)	0.00132		0.00097		
	Phosphorus (P)-Total (mg/L)	0.052		<0.050		
	Potassium (K)-Total (mg/L)	0.96		0.58		
	Selenium (Se)-Total (mg/L)	0.000091		0.000173		
	Silicon (Si)-Total (mg/L)	4.61		3.25		
	Silver (Ag)-Total (mg/L)	0.000017		<0.000010		
	Sodium (Na)-Total (mg/L)	1.62		1.31		
	Strontium (Sr)-Total (mg/L)	0.146		0.110		
	Sulfur (S)-Total (mg/L)	1.34		1.21		
	Thallium (TI)-Total (mg/L)	0.000030		<0.000010		
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Total (mg/L)	0.00812		0.00317		
	Uranium (U)-Total (mg/L)	0.000135		0.000055		
	Vanadium (V)-Total (mg/L)	0.00190		0.00108		
	Zinc (Zn)-Total (mg/L)	0.0042		<0.0030		
	Zirconium (Zr)-Total (mg/L)	0.00032		<0.00030		
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD		FIELD	
	Dissolved Metals Filtration Location		FIELD		FIELD	
	Aluminum (Al)-Dissolved (mg/L)		0.0067		0.0024	
	Antimony (Sb)-Dissolved (mg/L)		0.00016		<0.00010	
	Arsenic (As)-Dissolved (mg/L)		0.00022		0.00112	
	Barium (Ba)-Dissolved (mg/L)		0.148		0.618	
	Beryllium (Be)-Dissolved (mg/L)		<0.000020		<0.000020	
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050		<0.000050	
	Boron (B)-Dissolved (mg/L)		0.018		0.048	
	Cadmium (Cd)-Dissolved (mg/L)		0.0000154		0.00171	
	Calcium (Ca)-Dissolved (mg/L)		48.7		109	
	Chromium (Cr)-Dissolved (mg/L)		<0.00010		<0.00010	
	Cobalt (Co)-Dissolved (mg/L)		<0.00010		0.00477	
	Copper (Cu)-Dissolved (mg/L)		0.00221		0.00057	
	Iron (Fe)-Dissolved (mg/L)		<0.010		0.486	
	Lead (Pb)-Dissolved (mg/L)		<0.000050		<0.000050	
	Lithium (Li)-Dissolved (mg/L)		0.0085		0.0060	
	Magnesium (Mg)-Dissolved (mg/L)		6.14		13.1	
	Manganese (Mn)-Dissolved (mg/L)		0.00082		1.81	
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050		<0.000050	

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2663287-1 Surface Water 11-NOV-21 12:00 E257246	L2663287-2 Groundwater 11-NOV-21 12:00 E257244	L2663287-3 Surface Water 11-NOV-21 12:00 E257247	L2663287-4 Groundwater 11-NOV-21 12:00 E257237	L2663287-5 Groundwater 11-NOV-21 12:00 E257235
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)		0.000312		0.000113	0.00120
	Nickel (Ni)-Dissolved (mg/L)		<0.00050		0.00097	0.00311
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		0.80		7.32	1.77
	Selenium (Se)-Dissolved (mg/L)		0.000590		0.000300	0.000134
	Silicon (Si)-Dissolved (mg/L)		4.05		5.11	4.61
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)		4.74		6.33	3.54
	Strontium (Sr)-Dissolved (mg/L)		0.487		0.445	0.269
	Sulfur (S)-Dissolved (mg/L)		5.47		7.00	1.49
	Thallium (TI)-Dissolved (mg/L)		<0.000010		<0.000010	0.000106
	Tin (Sn)-Dissolved (mg/L)		<0.00010		0.00019	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.000247		0.00102	0.000425
	Vanadium (V)-Dissolved (mg/L)		<0.00050		<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		<0.0010		0.0012	0.0022
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030		<0.00030	<0.00030
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Chemical Oxygen Demand (mg/L)	<10	28	<10	19	50

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version: FINAL

	Sample ID Description Sampled Date Sampled Time Client ID	L2663287-6 Surface Water 11-NOV-21 12:00 E257250	L2663287-7 Groundwater 11-NOV-21 12:00 E257239	L2663287-8 Surface Water 11-NOV-21 12:00 E257245	L2663287-9 Groundwater 11-NOV-21 12:00 E257242	
Grouping	Analyte					
WATER						
Dissolved Metals	Molybdenum (Mo)-Dissolved (mg/L)		0.000887		0.000563	
	Nickel (Ni)-Dissolved (mg/L)		<0.00050		0.00876	
	Phosphorus (P)-Dissolved (mg/L)		<0.050		<0.050	
	Potassium (K)-Dissolved (mg/L)		0.74		1.76	
	Selenium (Se)-Dissolved (mg/L)		0.000310		0.000055	
	Silicon (Si)-Dissolved (mg/L)		3.33		4.38	
	Silver (Ag)-Dissolved (mg/L)		<0.000010		<0.000010	
	Sodium (Na)-Dissolved (mg/L)		3.51		3.05	
	Strontium (Sr)-Dissolved (mg/L)		0.423		0.423	
	Sulfur (S)-Dissolved (mg/L)		2.34		1.28	
	Thallium (TI)-Dissolved (mg/L)		<0.00010		0.000089	
	Tin (Sn)-Dissolved (mg/L)		<0.00010		<0.00010	
	Titanium (Ti)-Dissolved (mg/L)		<0.00030		<0.00030	
	Uranium (U)-Dissolved (mg/L)		0.000256		0.00130	
	Vanadium (V)-Dissolved (mg/L)		<0.00050		<0.00050	
	Zinc (Zn)-Dissolved (mg/L)		<0.0010		0.0061	
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030		<0.00030	
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Chemical Oxygen Demand (mg/L)	17	64	13	25	

^{*} Please refer to the Reference Information section for an explanation of any qualifiers detected.

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Version:

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)	
Matrix Spike	Chemical Oxygen Demand	MS-B	L2663287-1, -2, -3, -4, -5, -6, -7, -8, -9	
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2663287-2, -4, -5, -7, -9	
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2663287-2, -4, -5, -7, -9	
Matrix Spike	Calcium (Ca)-Total	MS-B	L2663287-1, -3, -6, -8	
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2663287-1, -3, -6, -8	
Matrix Spike	Strontium (Sr)-Total	MS-B	L2663287-1, -3, -6, -8	

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**		
BE-D-L-CCMS-CL	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)		

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-CL Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BOD-BC-CL Water Biochemical Oxygen Demand (BOD) APHA 5210 B-5 day Incub.-O2 electrode

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-L-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

COD-T-COL-CL Water Chemical Oxygen Demand (COD) APHA 5220 D Colorimetry

Samples are analyzed using the closed reflux colourimetric method

F-L-IC-CL Water Fluoride APHA 4110 B-Ion Chromatography

HARDNESS-CALC-CL Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents.

Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-CL Water Dissolved Mercury in Water by CVAAS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

HG-T-CVAA-CL Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Reference Information

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L2663287 CONTD....

Version: FINAL

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-CL Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

N2N3-CALC-CL Water Nitrate+Nitrite CALCULATION

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et

NO2-L-IC-N-CL

Water

Nitrite in Water by IC (Low Level)

EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL

Water

Nitrate in Water by IC (Low Level)

EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH/EC/ALK-CL

Water

pH, Conductivity and Total Alkalinity

APHA 4500H,2510,2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.

Alkalinity measurement is based on the sample's capacity to neutralize acid

Conductivity measurement is based on the sample's capacity to convey an electric current

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P)

APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-L-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TEMP-CLWaterTemperatureAPHA 2550-ThermometerTSS-L-CLWaterTotal Suspended SolidsAPHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code Laboratory Location

CL ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour 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.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

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

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L2663287 Report Date: 25-NOV-21 Page 1 of 11

Client: Sperling Hansen Associates Inc.

#8 - 1225 East Keith Road North Vancouver BC V7J 1J3

Contact: Scott Garthwaite

Test	Matrix	Reference	Result Q	ualifier	Units	RPD	Limit	Analyzed
BE-D-L-CCMS-CL	Water							
Batch R5653911								
WG3661410-2 LCS Beryllium (Be)-Dissolved	4		90.3		%		00.400	40 NOV 04
, ,	u		90.3		76		80-120	18-NOV-21
WG3661410-1 MB Beryllium (Be)-Dissolved	d		<0.000020		mg/L		0.00002	18-NOV-21
BE-T-L-CCMS-CL	Water							
Batch R5653911								
WG3660332-2 LCS		TMRM	00.7		0.4			
Beryllium (Be)-Total			88.7		%		80-120	18-NOV-21
WG3660332-1 MB Beryllium (Be)-Total			<0.000020		mg/L		0.00002	18-NOV-21
	101		10.000020		9/ =		0.00002	101101/21
BOD-BC-CL	Water							
Batch R5655670 WG3662227-4 DUP		L2663287-1						
Biochemical Oxygen De	emand	<2.0	<2.0	RPD-NA	mg/L	N/A	30	17-NOV-21
WG3662227-2 LCS								
Biochemical Oxygen De	emand		95.1		%		85-115	17-NOV-21
WG3662227-1 MB			0.0				_	
Biochemical Oxygen De	emano		<2.0		mg/L		2	17-NOV-21
C-TOT-ORG-LOW-CL	Water							
Batch R5655980								
WG3663597-2 LCS Total Organic Carbon			104.0		%		80-120	22-NOV-21
WG3663597-1 MB					,,		00-120	22 100 121
Total Organic Carbon			<0.50		mg/L		0.5	22-NOV-21
CL-L-IC-N-CL	Water							
Batch R5653519								
WG3660787-3 DUP		L2663287-1			_			
Chloride (CI)		0.75	0.73		mg/L	2.4	20	17-NOV-21
WG3660787-2 LCS Chloride (CI)			101.7		%		0E 44E	17 NOV 04
WG3660787-1 MB			101.7		/0		85-115	17-NOV-21
Chloride (CI)			<0.10		mg/L		0.1	17-NOV-21
WG3660787-4 MS		L2663287-1						
Chloride (CI)			115.3		%		75-125	17-NOV-21
COD-T-COL-CL	Water							



Workorder: L2663287 Report Date: 25-NOV-21 Page 2 of 11

Test	Matrix	Reference	Result Qu	ıalifier	Units	RPD	Limit	Analyzed
COD-T-COL-CL	Water							
Batch R5653948								
WG3661190-2 LCS Chemical Oxygen Dema	and		103.5		%		85-115	18-NOV-21
WG3661190-1 MB	aria		100.0		70		00-110	10-1100-21
Chemical Oxygen Dema	and		<10		mg/L		10	18-NOV-21
F-L-IC-CL	Water							
Batch R5653519								
WG3660787-3 DUP		L2663287-1			4			
Fluoride (F)		0.044	0.042		mg/L	4.4	20	17-NOV-21
WG3660787-2 LCS Fluoride (F)			99.7		%		85-115	17-NOV-21
WG3660787-1 MB			JU.1		,•		00-110	17-140 4-21
Fluoride (F)			<0.020		mg/L		0.02	17-NOV-21
WG3660787-4 MS		L2663287-1						
Fluoride (F)			112.8		%		75-125	17-NOV-21
HG-D-CVAA-CL	Water							
Batch R5652633								
WG3660347-2 LCS			404.0		0/			
Mercury (Hg)-Dissolved			101.0		%		80-120	17-NOV-21
WG3660347-1 MB Mercury (Hg)-Dissolved			<0.0000050		mg/L		0.000005	17-NOV-21
HG-T-CVAA-CL	Water				Ū			
Batch R5652633								
WG3660354-3 DUP		L2663287-1						
Mercury (Hg)-Total		<0.000050	<0.0000050	RPD-NA	mg/L	N/A	20	17-NOV-21
WG3660354-2 LCS			00.5		0/			
Mercury (Hg)-Total			98.5		%		80-120	17-NOV-21
WG3660354-1 MB Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	17-NOV-21
WG3660354-4 MS		L2663287-1			J		0.00000	11 110 V Z1
Mercury (Hg)-Total			101.0		%		70-130	17-NOV-21
MET-D-CCMS-CL	Water							
Batch R5653911								
WG3661410-2 LCS								
Aluminum (Al)-Dissolve			94.5		%		80-120	18-NOV-21
Antimony (Sb)-Dissolved	d		105.3		%		80-120	18-NOV-21
Arsenic (As)-Dissolved			94.5		%		80-120	18-NOV-21
Barium (Ba)-Dissolved			96.4		%		80-120	18-NOV-21



Workorder: L2663287 Report Date: 25-NOV-21 Page 3 of 11

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R565391	1							
WG3661410-2 LCS								
Bismuth (Bi)-Dissolve	d		97.9		%		80-120	18-NOV-21
Boron (B)-Dissolved			92.6		%		80-120	18-NOV-21
Cadmium (Cd)-Dissol			95.5		%		80-120	18-NOV-21
Calcium (Ca)-Dissolve			95.2		%		80-120	18-NOV-21
Chromium (Cr)-Dissol			96.3		%		80-120	18-NOV-21
Cobalt (Co)-Dissolved			96.9		%		80-120	18-NOV-21
Copper (Cu)-Dissolve	d		94.8		%		80-120	18-NOV-21
Iron (Fe)-Dissolved			94.4		%		80-120	18-NOV-21
Lead (Pb)-Dissolved			95.8		%		80-120	18-NOV-21
Lithium (Li)-Dissolved			94.3		%		80-120	18-NOV-21
Magnesium (Mg)-Diss	solved		90.5		%		80-120	18-NOV-21
Manganese (Mn)-Diss	solved		93.7		%		80-120	18-NOV-21
Molybdenum (Mo)-Dis	ssolved		101.4		%		80-120	18-NOV-21
Nickel (Ni)-Dissolved			94.8		%		80-120	18-NOV-21
Phosphorus (P)-Disso	olved		93.2		%		70-130	18-NOV-21
Potassium (K)-Dissolv	ved		96.9		%		80-120	18-NOV-21
Selenium (Se)-Dissolv	ved		92.5		%		80-120	18-NOV-21
Silicon (Si)-Dissolved			94.5		%		60-140	18-NOV-21
Silver (Ag)-Dissolved			99.6		%		80-120	18-NOV-21
Sodium (Na)-Dissolve	ed		94.6		%		80-120	18-NOV-21
Strontium (Sr)-Dissolv	/ed		96.9		%		80-120	18-NOV-21
Sulfur (S)-Dissolved			95.9		%		80-120	18-NOV-21
Thallium (TI)-Dissolve	ed		98.1		%		80-120	18-NOV-21
Tin (Sn)-Dissolved			100.0		%		80-120	18-NOV-21
Titanium (Ti)-Dissolve	ed		87.4		%		80-120	18-NOV-21
Uranium (U)-Dissolve	d		96.7		%		80-120	18-NOV-21
Vanadium (V)-Dissolv	red		97.8		%		80-120	18-NOV-21
Zinc (Zn)-Dissolved			88.6		%		80-120	18-NOV-21
Zirconium (Zr)-Dissolv	ved		99.0		%		80-120	18-NOV-21
WG3661410-1 MB								
Aluminum (Al)-Dissolv	ved .		<0.0010		mg/L		0.001	18-NOV-21
Antimony (Sb)-Dissolv	ved		<0.00010)	mg/L		0.0001	18-NOV-21
Arsenic (As)-Dissolve	d		<0.00010)	mg/L		0.0001	18-NOV-21
Barium (Ba)-Dissolved	d		<0.00010)	mg/L		0.0001	18-NOV-21



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	Water							
Batch R56539	11							
WG3661410-1 MB			0.000050					
Bismuth (Bi)-Dissolve	ea		<0.000050)	mg/L		0.00005	18-NOV-21
Boron (B)-Dissolved			<0.010		mg/L		0.01	18-NOV-21
Cadmium (Cd)-Disso			<0.000005	oC .	mg/L		0.000005	18-NOV-21
Calcium (Ca)-Dissolv			<0.050		mg/L		0.05	18-NOV-21
Chromium (Cr)-Disso			<0.00010		mg/L		0.0001	18-NOV-21
Cobalt (Co)-Dissolve			<0.00010		mg/L		0.0001	18-NOV-21
Copper (Cu)-Dissolve	ed		<0.00020		mg/L		0.0002	18-NOV-21
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	18-NOV-21
Lead (Pb)-Dissolved			<0.000050)	mg/L		0.00005	18-NOV-21
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	18-NOV-21
Magnesium (Mg)-Dis	solved		<0.0050		mg/L		0.005	18-NOV-21
Manganese (Mn)-Dis	solved		<0.00010		mg/L		0.0001	18-NOV-21
Molybdenum (Mo)-Di	ssolved		<0.000050)	mg/L		0.00005	18-NOV-21
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	18-NOV-21
Phosphorus (P)-Diss	olved		< 0.050		mg/L		0.05	18-NOV-21
Potassium (K)-Dissol	ved		<0.050		mg/L		0.05	18-NOV-21
Selenium (Se)-Disso	lved		<0.000050)	mg/L		0.00005	18-NOV-21
Silicon (Si)-Dissolved	I		<0.050		mg/L		0.05	18-NOV-21
Silver (Ag)-Dissolved			<0.000010)	mg/L		0.00001	18-NOV-21
Sodium (Na)-Dissolve	ed		<0.050		mg/L		0.05	18-NOV-21
Strontium (Sr)-Dissol	ved		<0.00020		mg/L		0.0002	18-NOV-21
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	18-NOV-21
Thallium (TI)-Dissolve	ed		<0.000010)	mg/L		0.00001	18-NOV-21
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	18-NOV-21
Titanium (Ti)-Dissolv	ed		<0.00030		mg/L		0.0003	18-NOV-21
Uranium (U)-Dissolve	ed		<0.000010)	mg/L		0.00001	18-NOV-21
Vanadium (V)-Dissol	ved		<0.00050		mg/L		0.0005	18-NOV-21
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	18-NOV-21
Zirconium (Zr)-Dissol	ved		<0.00020		mg/L		0.0002	18-NOV-21
MET-T-CCMS-CL	Water							
Batch R56539								
WG3660332-2 LCS	3	TMRM	00.5		0/			
Aluminum (Al)-Total			93.5		%		80-120	18-NOV-21
Antimony (Sb)-Total			107.3		%		80-120	18-NOV-21



Workorder: L2663287 Report Date: 25-NOV-21 Page 5 of 11

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5653911								
WG3660332-2 LCS		TMRM	00.7		0/			
Arsenic (As)-Total			93.7		%		80-120	18-NOV-21
Barium (Ba)-Total			93.5		%		80-120	18-NOV-21
Bismuth (Bi)-Total			95.7		%		80-120	18-NOV-21
Boron (B)-Total			88.5		%		80-120	18-NOV-21
Cadmium (Cd)-Total			91.7		%		80-120	18-NOV-21
Calcium (Ca)-Total			92.5		%		80-120	18-NOV-21
Chromium (Cr)-Total			97.6		%		80-120	18-NOV-21
Cobalt (Co)-Total			96.3		%		80-120	18-NOV-21
Copper (Cu)-Total			95.2		%		80-120	18-NOV-21
Iron (Fe)-Total			95.4		%		80-120	18-NOV-21
Lead (Pb)-Total			95.0		%		80-120	18-NOV-21
Lithium (Li)-Total			96.6		%		80-120	18-NOV-21
Magnesium (Mg)-Total			86.1		%		80-120	18-NOV-21
Manganese (Mn)-Total			93.4		%		80-120	18-NOV-21
Molybdenum (Mo)-Tota	l		97.2		%		80-120	18-NOV-21
Nickel (Ni)-Total			92.4		%		80-120	18-NOV-21
Phosphorus (P)-Total			99.8		%		70-130	18-NOV-21
Potassium (K)-Total			97.1		%		80-120	18-NOV-21
Selenium (Se)-Total			97.0		%		80-120	18-NOV-21
Silicon (Si)-Total			93.5		%		60-140	18-NOV-21
Silver (Ag)-Total			96.9		%		80-120	18-NOV-21
Sodium (Na)-Total			94.7		%		80-120	18-NOV-21
Strontium (Sr)-Total			95.1		%		80-120	18-NOV-21
Sulfur (S)-Total			105.4		%		80-120	18-NOV-21
Thallium (TI)-Total			95.5		%		80-120	18-NOV-21
Tin (Sn)-Total			96.8		%		80-120	18-NOV-21
Titanium (Ti)-Total			84.0		%		80-120	18-NOV-21
Uranium (U)-Total			93.8		%		80-120	18-NOV-21
Vanadium (V)-Total			98.3		%		80-120	18-NOV-21
Zinc (Zn)-Total			86.2		%		80-120	18-NOV-21
Zirconium (Zr)-Total			97.5		%		80-120	18-NOV-21
WG3660332-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	18-NOV-21
Antimony (Sb)-Total			<0.00010)	mg/L		0.0001	18-NOV-21



Workorder: L2663287 Report Date: 25-NOV-21 Page 6 of 11

est	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-CL	Water							
Batch R5653911								
WG3660332-1 MB Arsenic (As)-Total			<0.00010		ma/l		0.0001	40 NOV 04
Barium (Ba)-Total			<0.00010		mg/L mg/L		0.0001 0.0001	18-NOV-21
Bismuth (Bi)-Total			<0.00010	1	mg/L		0.0001	18-NOV-21
Boron (B)-Total			<0.000	,	mg/L			18-NOV-21
Cadmium (Cd)-Total			<0.00005	sr.	mg/L		0.01 0.000005	18-NOV-21
Calcium (Ca)-Total			<0.050		mg/L			18-NOV-21
` ,					•		0.05	18-NOV-21
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	18-NOV-21
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	18-NOV-21
Copper (Cu)-Total			<0.00050		mg/L		0.0005	18-NOV-21
Iron (Fe)-Total			<0.010		mg/L		0.01	18-NOV-21
Lead (Pb)-Total			<0.000050)	mg/L		0.00005	18-NOV-21
Lithium (Li)-Total			<0.0010		mg/L		0.001	18-NOV-21
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	18-NOV-21
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	18-NOV-21
Molybdenum (Mo)-Total			<0.000050)	mg/L		0.00005	18-NOV-21
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	18-NOV-21
Phosphorus (P)-Total			<0.050		mg/L		0.05	18-NOV-21
Potassium (K)-Total			< 0.050		mg/L		0.05	18-NOV-21
Selenium (Se)-Total			<0.000050)	mg/L		0.00005	18-NOV-21
Silicon (Si)-Total			< 0.050		mg/L		0.05	18-NOV-21
Silver (Ag)-Total			<0.000010)	mg/L		0.00001	18-NOV-21
Sodium (Na)-Total			< 0.050		mg/L		0.05	18-NOV-21
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	18-NOV-21
Sulfur (S)-Total			<0.50		mg/L		0.5	18-NOV-21
Thallium (TI)-Total			<0.000010)	mg/L		0.00001	18-NOV-21
Tin (Sn)-Total			<0.00010		mg/L		0.0001	18-NOV-21
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	18-NOV-21
Uranium (U)-Total			<0.000010)	mg/L		0.00001	18-NOV-21
Vanadium (V)-Total			<0.00050		mg/L		0.0005	18-NOV-21
Zinc (Zn)-Total			<0.0030		mg/L		0.003	18-NOV-21
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	18-NOV-21
NH3-1 -E-C1	Water							

NH3-L-F-CL

Water



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Test		Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-L-F-CL		Water							
	656585								
WG3664205-6 Ammonia as N	LCS			101.6		%		85-115	23-NOV-21
WG3664205-5	MB								
Ammonia as N				<0.0050		mg/L		0.005	23-NOV-21
NO2-L-IC-N-CL		Water							
Batch R5	653519								
WG3660787-3	DUP		L2663287-1	-0.0010	DDD NA	ma/l	NI/A	20	47 NOV 04
Nitrite (as N) WG3660787-2	LCS		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-NOV-21
Nitrite (as N)	LUS			103.1		%		90-110	17-NOV-21
WG3660787-1	MB								
Nitrite (as N)				<0.0010		mg/L		0.001	17-NOV-21
WG3660787-4	MS		L2663287-1	440.7		%		75.405	47.1101/104
Nitrite (as N)				113.7		70		75-125	17-NOV-21
NO3-L-IC-N-CL		Water							
Batch R5 WG3660787-3	653519 DUP		1 2002207 4						
Nitrate (as N)	DUP		L2663287-1 0.0195	0.0202		mg/L	3.5	20	17-NOV-21
WG3660787-2	LCS								
Nitrate (as N)				102.6		%		90-110	17-NOV-21
WG3660787-1	MB			0.0050		/1		0.005	.=
Nitrate (as N)			1 000007 4	<0.0050		mg/L		0.005	17-NOV-21
WG3660787-4 Nitrate (as N)	MS		L2663287-1	115.2		%		75-125	17-NOV-21
PH/EC/ALK-CL		Water							
	653667								
WG3660920-9	DUP		L2663287-8						
рН			7.83	7.83	J	рН	0.00	0.2	17-NOV-21
Conductivity (E0			119	120		uS/cm	0.5	10	17-NOV-21
Bicarbonate (HC	CO3)		78.4	79.4		mg/L	1.2	20	17-NOV-21
Carbonate (CO	,		<5.0	<5.0	RPD-NA	mg/L	N/A	20	17-NOV-21
Hydroxide (OH)			<5.0	<5.0	RPD-NA	mg/L	N/A	20	17-NOV-21
Alkalinity, Total	•	O3)	64.3	65.1		mg/L	1.2	20	17-NOV-21
WG3660920-5 Conductivity (EC				97.5		%		00 110	17-NOV-21
Alkalinity, Total	•	O3)		109.2		%		90-110 85-115	17-NOV-21 17-NOV-21
WG3660920-8	LCS	0 0)		100.2		/0		00-110	17-11007-21



Workorder: L2663287 Report Date: 25-NOV-21

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Test Matrix Reference Result Qualifier Units **RPD** Limit Analyzed PH/EC/ALK-CL Water **Batch** R5653667 WG3660920-8 LCS Conductivity (EC) 99.5 % 90-110 17-NOV-21 Alkalinity, Total (as CaCO3) 110.2 % 17-NOV-21 85-115 WG3660920-4 Conductivity (EC) <2.0 uS/cm 2 17-NOV-21 Bicarbonate (HCO3) mg/L < 5.0 5 17-NOV-21 Carbonate (CO3) <5.0 mg/L 5 17-NOV-21 Hydroxide (OH) < 5.0 mg/L 5 17-NOV-21 Alkalinity, Total (as CaCO3) <2.0 mg/L 2 17-NOV-21 WG3660920-7 Conductivity (EC) <2.0 uS/cm 2 17-NOV-21 Bicarbonate (HCO3) <5.0 mg/L 5 17-NOV-21 Carbonate (CO3) <5.0 5 mg/L 17-NOV-21 Hydroxide (OH) <5.0 mg/L 5 17-NOV-21 Alkalinity, Total (as CaCO3) <2.0 mg/L 2 17-NOV-21 PO4-DO-L-COL-CL Water Batch R5652559 WG3660336-3 DUP L2663287-1 0.0068 0.0064 Orthophosphate-Dissolved (as P) mg/L 6.5 20 17-NOV-21 WG3660336-2 LCS Orthophosphate-Dissolved (as P) 96.8 % 80-120 17-NOV-21 WG3660336-1 MB Orthophosphate-Dissolved (as P) <0.0010 mg/L 0.001 17-NOV-21 WG3660336-4 L2663287-1 Orthophosphate-Dissolved (as P) 98.9 % 70-130 17-NOV-21 SO4-L-IC-N-CL Water **Batch** R5653519 WG3660787-3 DUP L2663287-1 Sulfate (SO4) 3.39 3.32 mg/L 2.1 20 17-NOV-21 WG3660787-2 LCS Sulfate (SO4) 104.6 % 85-115 17-NOV-21 WG3660787-1 MB Sulfate (SO4) < 0.050 mg/L 0.05 17-NOV-21 WG3660787-4 MS L2663287-1 Sulfate (SO4) 117.8 % 75-125 17-NOV-21 Water **TEMP-CL**



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TEMP-CL	Water							
Batch R5653667 WG3660920-9 DUP Temperature		L2663287-8 21.2	21.3		Degree C	0.5	25	17-NOV-21
TSS-L-CL	Water							
Batch R5653738								
WG3659960-4 LCS Total Suspended Solids			90.2		%		85-115	17-NOV-21
WG3659960-3 MB Total Suspended Solids			<1.0		mg/L		1	17-NOV-21

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Workorder: L2663287 Report Date: 25-NOV-21 Page 11 of 11

Hold Time Exceedances:

ALS Product Description	ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
		Oumpling Date	Date 1 10003300	1100.111	Aotaariii	Oilito	Qualific
Anions and Nutrients							
Nitrate in Water by IC (Low	Level)						
• ,	1	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	2	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	3	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	4	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	5	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	6	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	7	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	8	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	9	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
Nitrite in Water by IC (Low	Level)					-	
• ,	1	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	2	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	3	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	4	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	5	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	6	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	7	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	8	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
	9	11-NOV-21 12:00	17-NOV-21 09:51	3	6	days	EHTR
Orthophosphate-Dissolved	(as P)					•	
	1	11-NOV-21 12:00	17-NOV-21 12:36	3	6	days	EHTR
	2	11-NOV-21 12:00	17-NOV-21 12:38	3	6	days	EHTR
	3	11-NOV-21 12:00	17-NOV-21 12:40	3	6	days	EHTR
	4	11-NOV-21 12:00	17-NOV-21 12:40	3	6	days	EHTR
	5	11-NOV-21 12:00	17-NOV-21 12:40	3	6	days	EHTR
	6	11-NOV-21 12:00	17-NOV-21 12:43	3	6	days	EHTR
	7	11-NOV-21 12:00	17-NOV-21 12:43	3	6	days	EHTR
	8	11-NOV-21 12:00	17-NOV-21 12:43	3	6	days	EHTR
	9	11-NOV-21 12:00	17-NOV-21 12:45	3	6	days	EHTR
Legend & Qualifier Definitio						,	

Legend & Qualifier Definitions:

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

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

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2663287 were received on 16-NOV-21 08:50.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS



L2663287-COFC

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 -

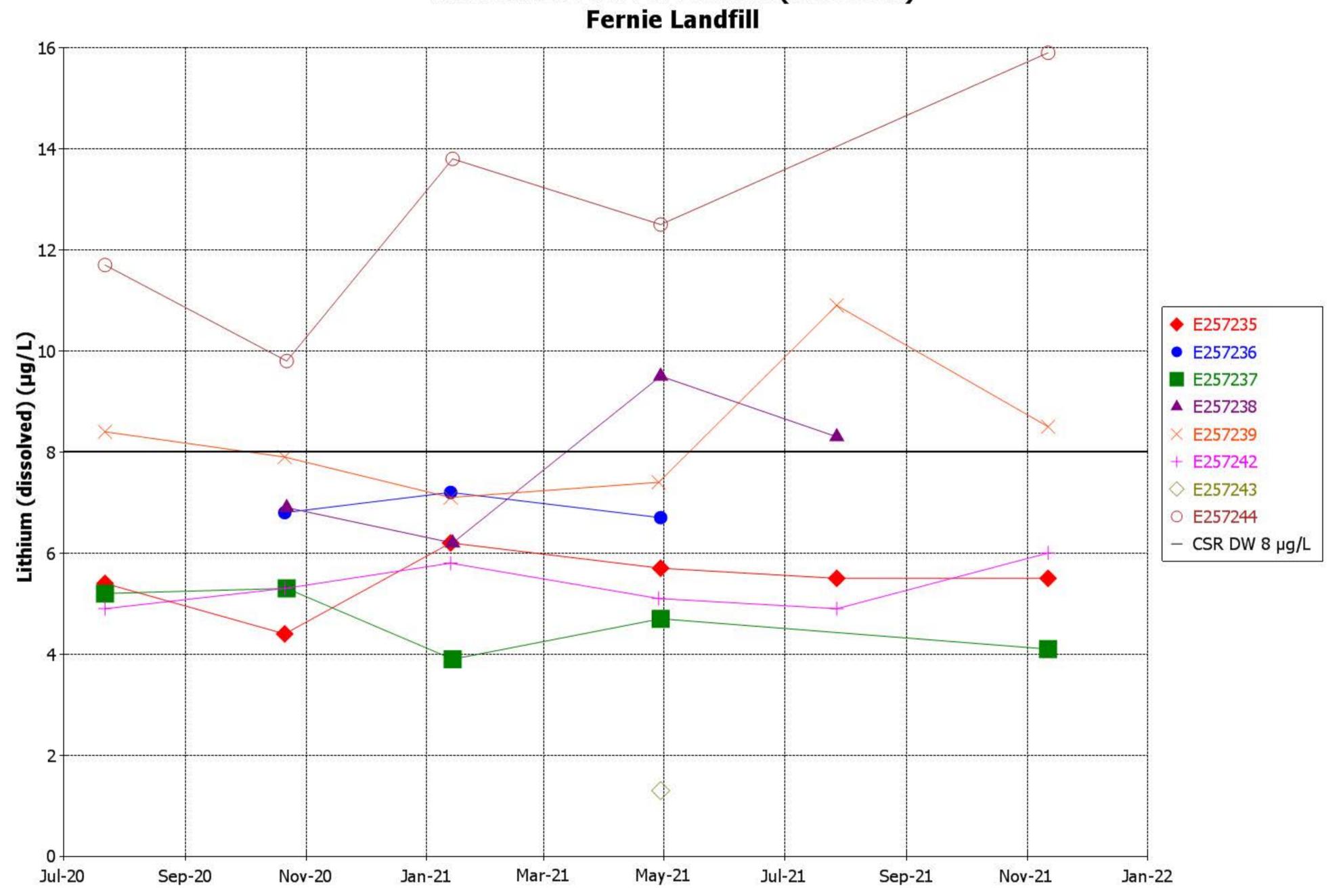
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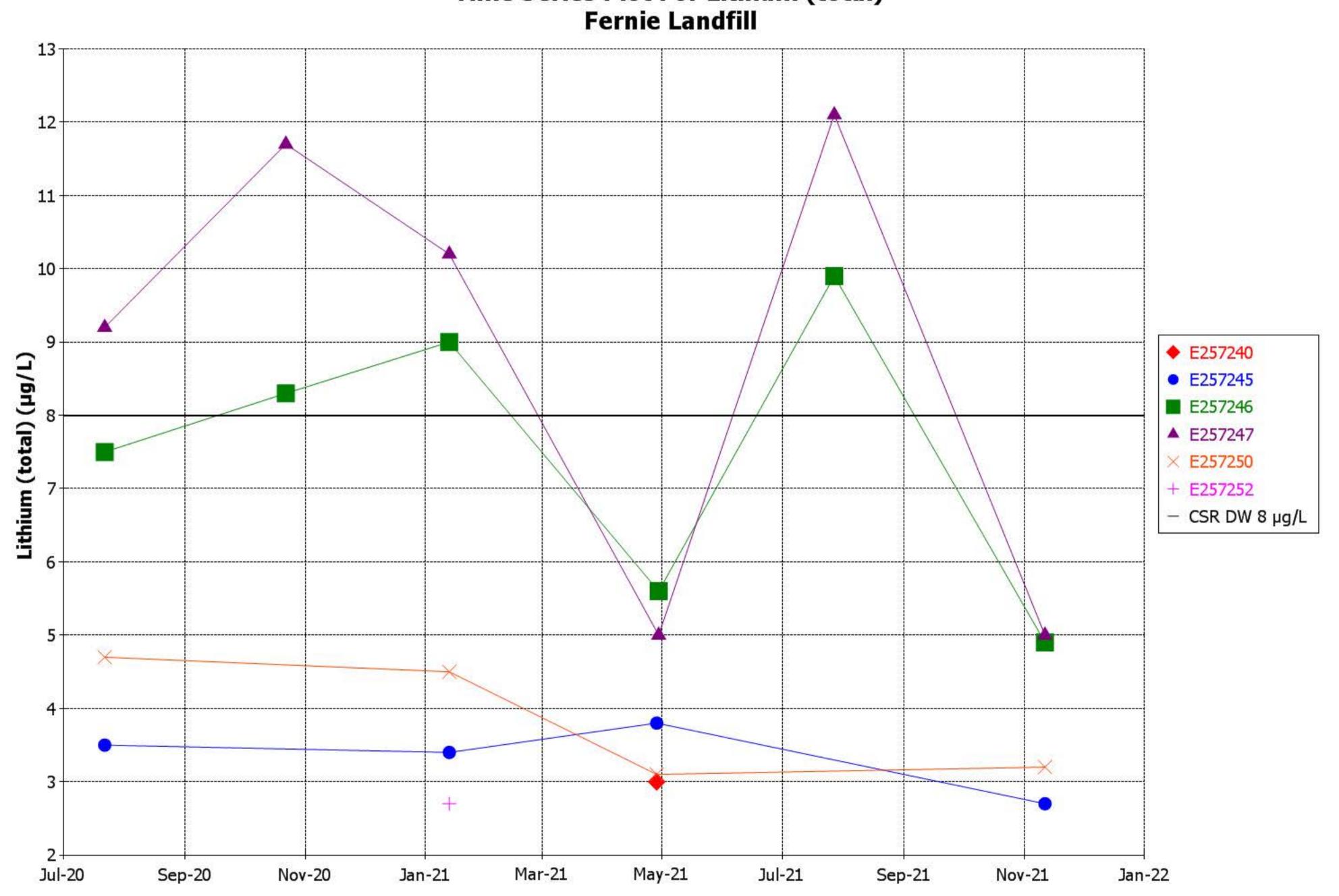
D Control of the Cont							Penado / Destricado					Toward Time (MATE) S											25.5.460		Series in	30/1620/54		
Report To	Contact and company name below will appear on the final report				Salast Basert I	Reports / Recipients					Turnaround Time (TAT) Requested																	
Company:										Routine [R] if received by 3pm M-F - no surcharges apply										i.								
Contact:	Scott Garthwaite 778-471-7088									4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum										AFFIX ALS BARCODE LABEL HERE								
					_	t - provide details be		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										(ALS use only)										
				Select Distribut				1 day [E] if received by 3pm M-F - 100% rush surcharge minimum																				
				Ellian Tol Fax Sanding Specimens					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-																			
City/Province:												routine tests Date and Time Required for all ESP TATs: dd-mmm-vy hh:mm am/pm																
Postal Code:	V7J 1J3																											
Invoice To	Same as Report To	☑ YES			-	Invoice R			For all tests with rush TATs requested, please contact your AM to confirm availability.																			
	Copy of Invoice with Re	port 🖸 YES	∐ NO			Distribution: 🗸 El			Analysis Request																			
Company:						chetherington@sp	perlinghansen.co	om	Indicate Filtered (F), Preserved (P) or Filtered and Pres											erved (F/P) below						es)		
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	20050 Fernie -	_	···		Major/Minor Code:		Routing Code:		18	J Du									ا يو ا		ŀ			오	<u>8</u>	AR		
PO / AFE:					Requisitioner:	·			ш	e, cor			(F/P)						supfate					8	STORAGE REQUIRED	AZ		
LSD:				******	Location:		,		O .	atrī			als (F					snc	e, si	ł]			ST	I		
ALS Lab Work	c Order# (ALS use only	n:			ALS Contact:	Dean Watt	Sampler:	TM	BER	temper	Total Alkalinity		Dissolved Metals	Fotal Metals (P)	a	nitrite		sphore	chloride,		•			SAMPLES	EXTENDED	SUSPECTED HAZARD (see notes)		
ALS Sample #	Sam	ple Identificatio	n and/or Coo	rdinates		Date	Time	Sample Type	NSN	Anions,	al Al	١ ,, ١	solve	ğ	Ammonia	ate, r		do	fluoride,					Σ	臣	SPI		
(ALS use only)	(Thi	s description will	l appear on the	report)		(dd-mmm-yy)	(hh:ṛnm)	Sample Type	Ž	Anic	Tota	TSS	Dis	Tota	Amı	nitrate,	T0C	orthoph	fluo	000	BOD			છે.	ă	su		
1	E257246 🗸					59-11-21		Surface Water	5	R	R	R		R	R	R	R	R	R	R	R		\Box					
7	E257244	· · · · · · · · · · · · · · · · · · ·						Groundwater	5	R	R		R	,	R	'R	1R	Ŗ	·PR	R	R							
3	E257247 V.							Surface Water	5	R	R	R		R	R	R	R	R	R	R	R			1				
4	E257237					111	<u> </u>	Groundwater	5	R	R		R		R	R	R	R	R	R	R	$\overline{}$	十	_				
- 5	E257235 🗸				-	11	<u> </u>	Groundwater	5	R	R		R		R	R	R	R	R	R	R		\dashv	_	寸	_		
6	E257250 🗸					"		Surface Water	5	R	R	. R		R	R	R	R	R	R	R	R	\dashv	<u> </u>		寸	$\overline{}$		
2	E257239			-		- 11		Groundwater	5	R	R		R		R	R	R	R	R	R	R	\dashv	$-\dagger$	1				
8	E257245		 -			11		Surface Water	5	R	R	R		R	R	R	R	R	R	R	R	\dashv		_	7			
9	E257242					٧٠	<u> </u>	Groundwater_	5	. R.	_R_		-R-		- R-	-R	-R	R-	_R_	- R -	-R	_						
	E257252							Groundwater		-R-	R			R	R	R	-R-	-R-	-R-	R	R			一				
								Groundwater		Ŕ	R	_	R		R	·R	R	R	R	R	R		\dashv					
	E257241							Groundwater		-R-	, R		-R-		R		-R-	R	R	R	-R		\dashv		_†			
			Notes	s / Specify	Limits for result e	evaluation by selecti	ng from drop-do	wn below	14					SAMP	LE R	ECEIF	T DE	TAIL:	S (AL	use	only)							
Drinking	Water (DW) Samples ¹ (client use)		., .,		xcel COC only)			Cooli	ing Me	thod:		CO					-	FRC		T	0.00	OLING	Sec. 10 40	TED			
Are samples take	en from a Regulated DW S	ystem?	British Colum	bia Conta	minated Sites Re	gulation Stage 10 A	Amendment (NC	V, 2017)	Submission Comments identified on Sample Receipt Notification:																			
☐ YES ☑ NO British Columbia Approve				ved and Working	Water Quality Guid	delines (MAY, 20	015)	Cooler Custody Seals intact: YES N/A Sample Custody Seals Intact YES N/A																				
Are samples for human consumption/ use?				1					JIN	ITIAL	COOLE	RITEM	PERAT	URES	°C			* FI	NAL CO	OLER	TEMP	ERATU	RES °C	3 [] [
☐ YES ☑ NO									9					Ш,														
	SHIPMENT RELE	ASE (client us	e)		J	NITIAL SHIPMENT	RECEPTION (ALS use only)						FI	NAL	SHIPN	MENT	REC	PTIC	N (AL	.S use	only	1					
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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION						// WH	NE - LABORATO	I / III	0W -	CLIEN	T CO	- - -										لتنك			AUG 2020	O FRONT		



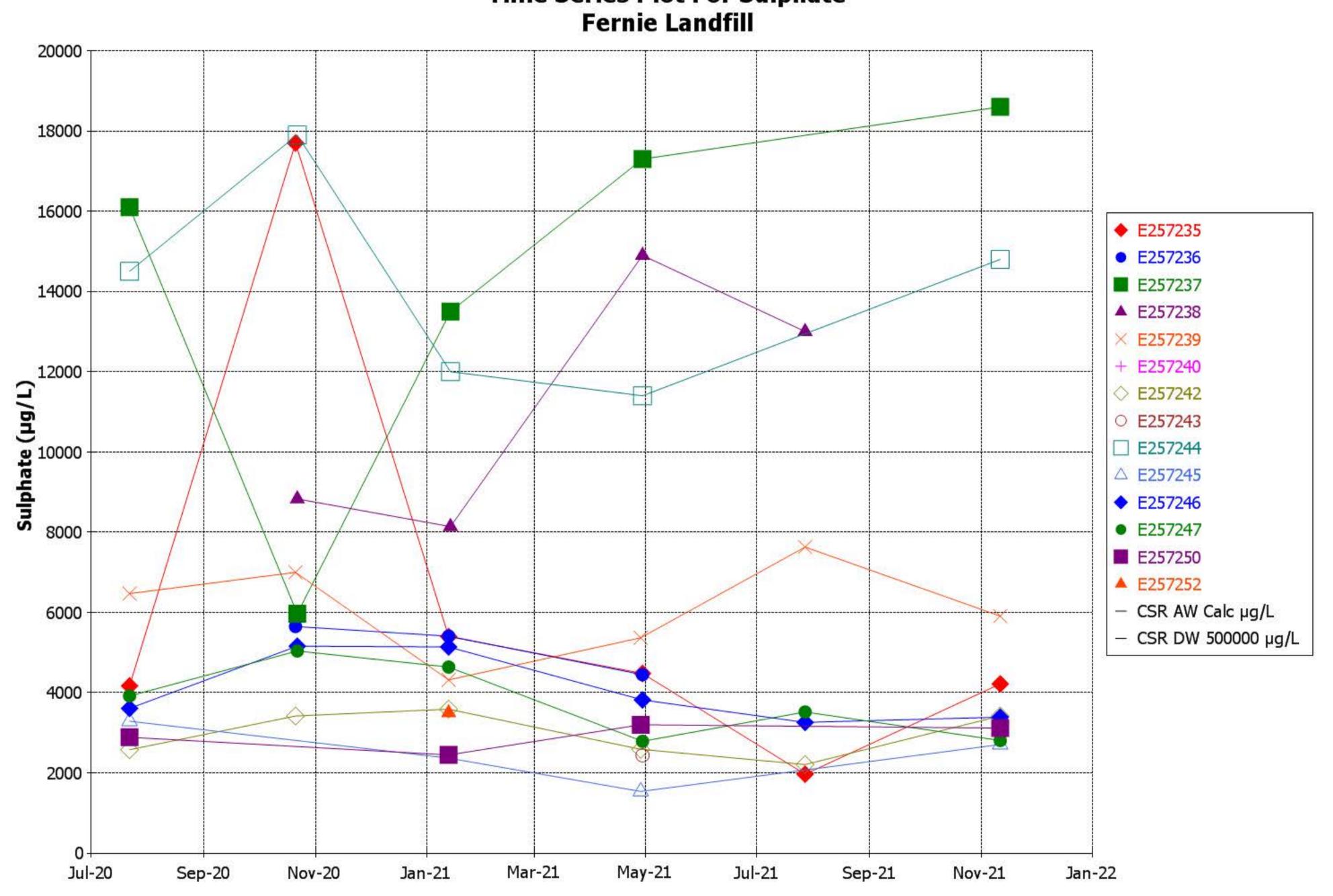
Time Series Plot For Lithium (dissolved)



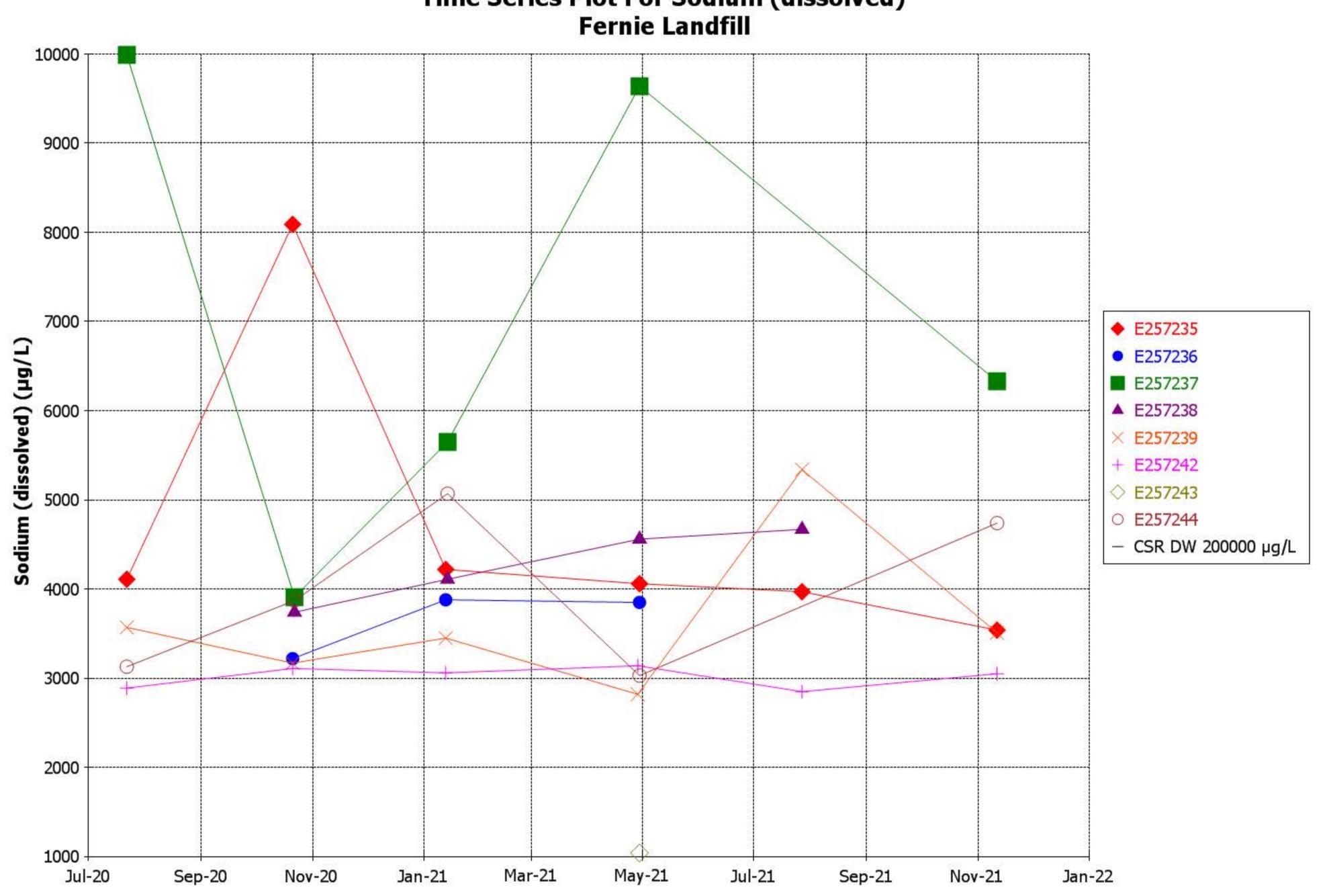
Time Series Plot For Lithium (total)



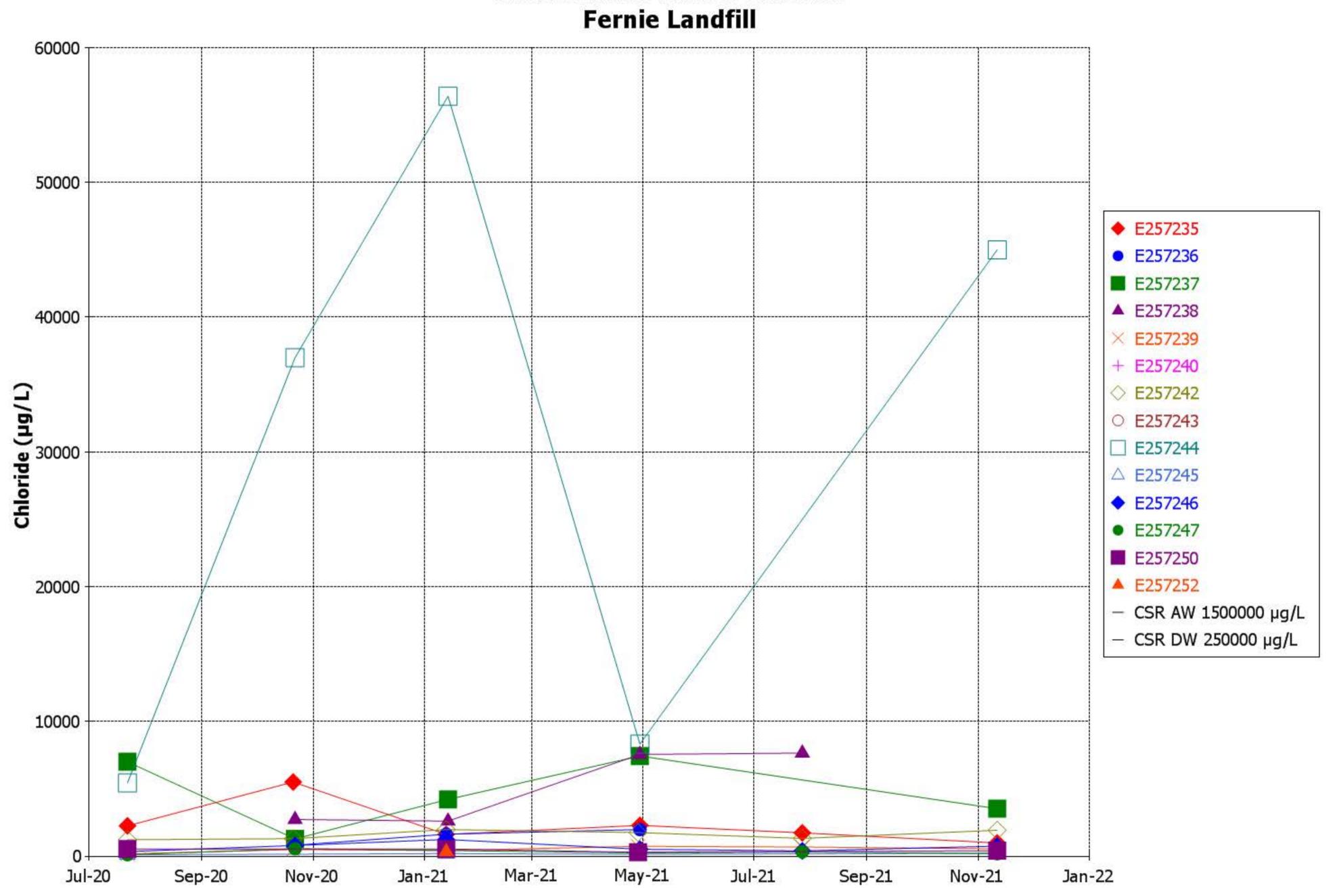
Time Series Plot For Sulphate



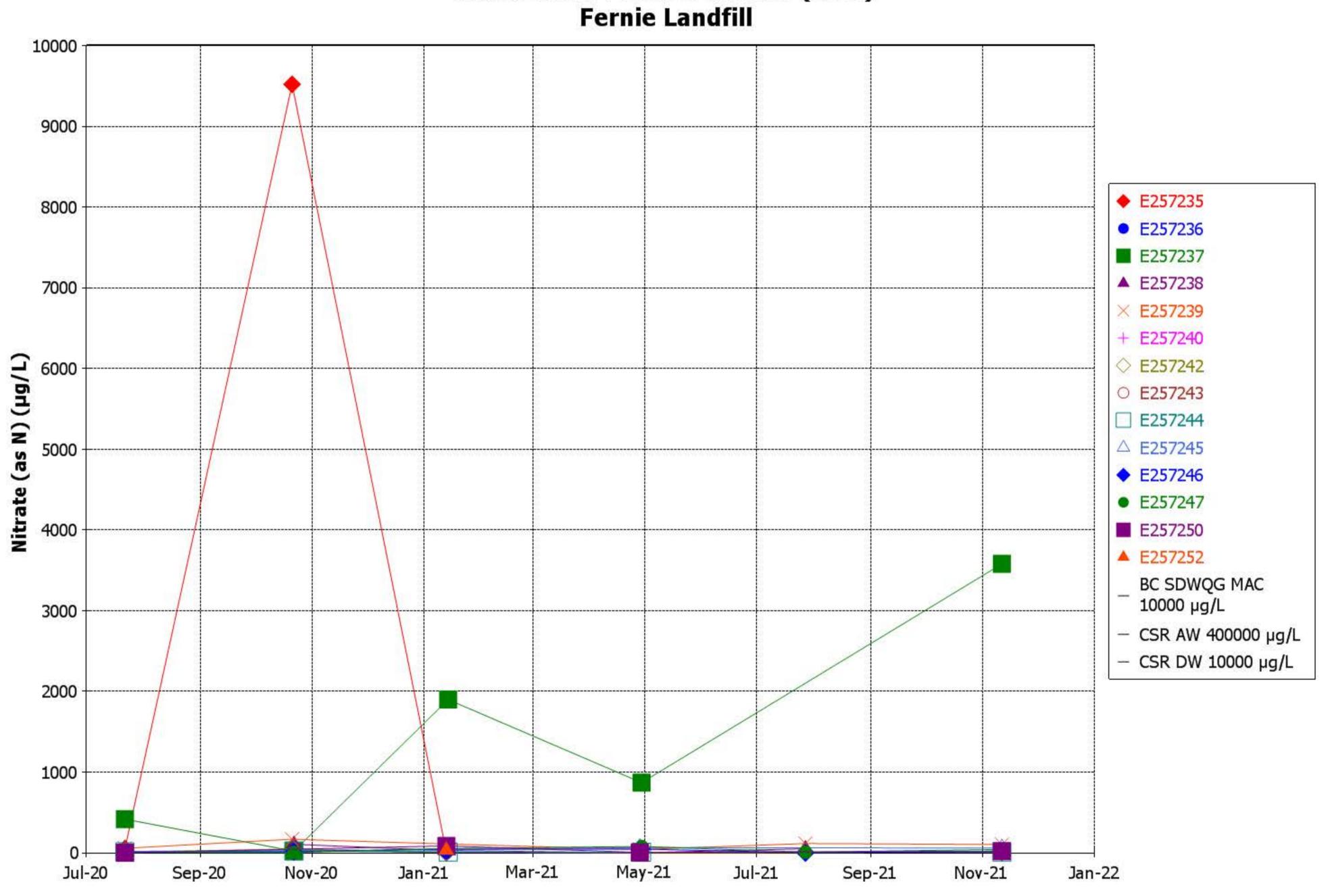
Time Series Plot For Sodium (dissolved)



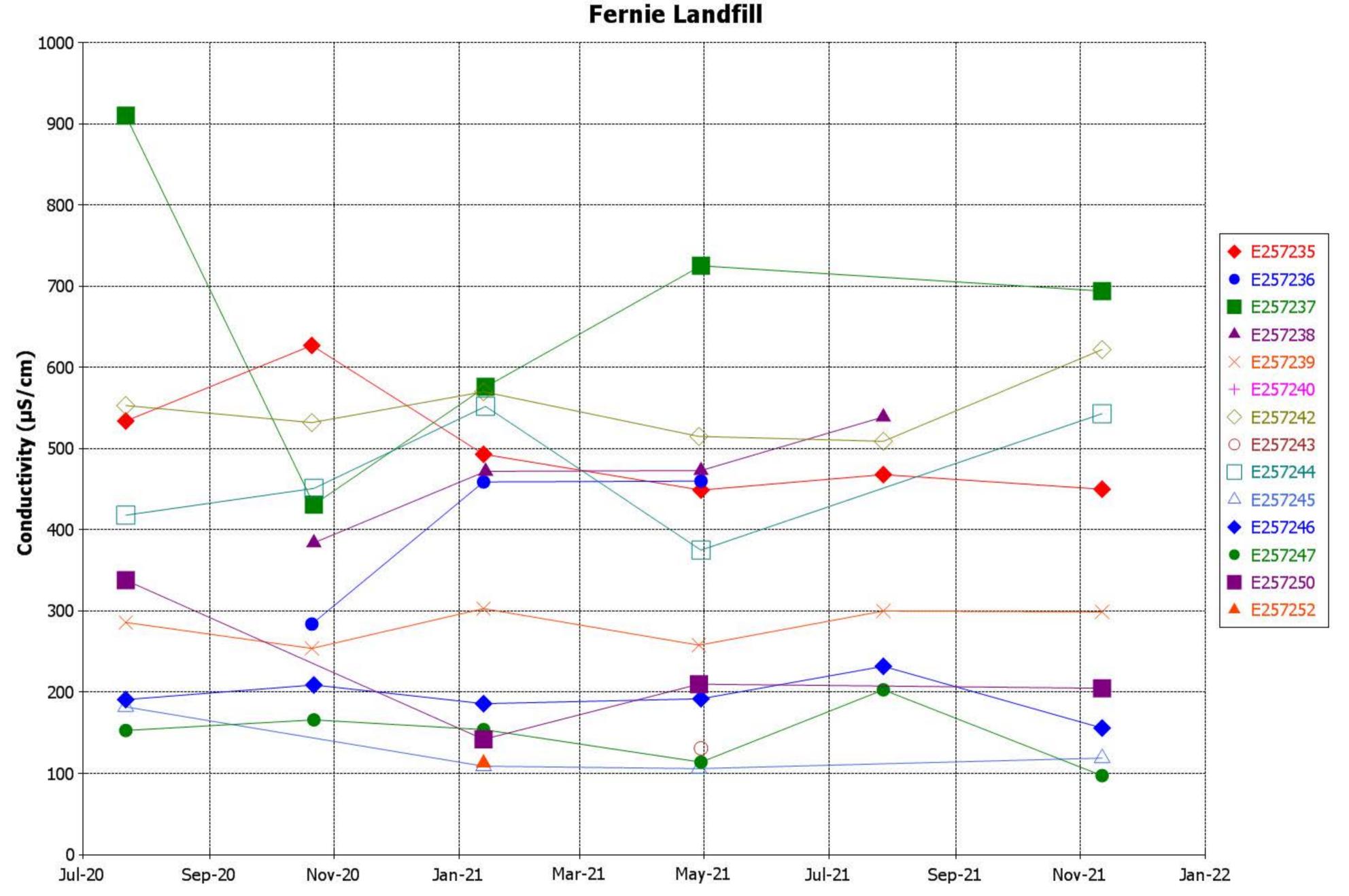
Time Series Plot For Chloride



Time Series Plot For Nitrate (as N) Fernie Landfill



Time Series Plot For Conductivity Fernie Landfill



Time Series Plot For Manganese (dissolved)

