



CERTIFICATE OF ANALYSIS

<p>Work Order : FC2301253</p> <p>Client : Regional Municipality of Wood Buffalo</p> <p>Contact : Water Treatment Plant</p> <p>Address : 1 Silin Forest Road Fort McMurray AB Canada T9H 5A1</p> <p>Telephone : 780-762-5863</p> <p>Project : Fort Chipewyan Imperial Release</p> <p>PO : 4500051416</p> <p>C-O-C number : ----</p> <p>Sampler : ----</p> <p>Site : Schedule 4: Fort Chip</p> <p>Quote number : Q61323 (Fort chip)</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 8</p> <p>Laboratory : Fort McMurray - Environmental</p> <p>Account Manager : Megan Trydal</p> <p>Address : #4, 340 Macalpine Crescent Fort McMurray AB Canada T9H 4A8</p> <p>Telephone : +1 780 791 1524</p> <p>Date Samples Received : 19-May-2023 13:45</p> <p>Date Analysis Commenced : 20-May-2023</p> <p>Issue Date : 25-May-2023 18:01</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrew Fox		Metals, Calgary, Alberta
Brieanna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
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Nguyen Tran	Laboratory Analyst	Organics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Metals, Calgary, Alberta



General Comments

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

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

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

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

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

Unit	Description
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
psu	practical salinity units

<: less than.

>: greater than.

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

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

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

Accreditation

Accreditation	Description	Laboratory	Address
A	CALA ISO/IEC 17025:2017	CG Calgary - Environmental	2559 29th Street NE, Calgary, Alberta
B	CALA ISO/IEC 17025:2017	EO Edmonton - Environmental	9450 - 17 Avenue NW, Edmonton, Alberta
C	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.



Analytical Results

Sub-Matrix: Water					Client sample ID	Treated Water	Raw Water Pond 1	---	---	---
(Matrix: Water)					Client sampling date / time	19-May-2023 09:15	19-May-2023 09:20	---	---	---
Analyte	CAS Number	Method/Lab	LOR	Unit	FC2301253-001	FC2301253-002	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/CG	0.50	mg/L	27.0	26.8	---	---	---	
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/CG	0.50	mg/L	29.8	30.0	---	---	---	
Salinity	----	EC100S/VA	1.0	psu	<1.0	<1.0	---	---	---	
Conductivity	----	E100/CG	A	2.0	µS/cm	120	73.3	---	---	
pH	----	E108/CG	A	0.10	pH units	8.13	7.62	---	---	
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/CG	A	1.0	mg/L	43.9	34.0	---	---	
Alkalinity, carbonate (as CO3)	3812-32-6	E290/CG	A	1.0	mg/L	<1.0	<1.0	---	---	
Alkalinity, hydroxide (as OH)	14280-30-9	E290/CG	A	1.0	mg/L	<1.0	<1.0	---	---	
Alkalinity, total (as CaCO3)	----	E290/CG	A	2.0	mg/L	36.0	27.9	---	---	
Solids, total dissolved [TDS], calculated	----	EC103/CG	1.0	mg/L	62.3	41.4	---	---	---	
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/CG	A	0.50	mg/L	11.9	3.17	---	---	
Fluoride	16984-48-8	E235.F/CG	A	0.020	mg/L	<0.020	0.053	---	---	
Nitrate (as N)	14797-55-8	E235.NO3/CG	A	0.020	mg/L	<0.020	<0.020	---	---	
Nitrite (as N)	14797-65-0	E235.NO2/CG	A	0.010	mg/L	<0.010	<0.010	---	---	
Sulfate (as SO4)	14808-79-8	E235.SO4/CG	A	0.30	mg/L	3.08	4.15	---	---	
Nitrate + Nitrite (as N)	----	EC235.N+N/C G		0.0500	mg/L	<0.0500	<0.0500	---	---	
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395/VA	C	0.0015	mg/L	<0.0015	<0.0015	---	---	
Ion Balance										
Anion sum	----	EC101/CG		0.10	meq/L	1.12	0.74	---	---	
Cation sum	----	EC101/CG		0.10	meq/L	1.09	0.69	---	---	
Ion balance (APHA)	----	EC101/CG		0.01	%	-1.36	-3.50	---	---	
Ion balance (cations/anions)	----	EC101/CG		0.010	%	97.3	93.2	---	---	
Total Metals										
Aluminum, total	7429-90-5	E420/CG	A	0.0030	mg/L	0.0204	0.164	---	---	
Antimony, total	7440-36-0	E420/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	
Arsenic, total	7440-38-2	E420/CG	A	0.00010	mg/L	0.00024	0.00032	---	---	



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Analyte	CAS Number	Method/Lab	LOR	Unit		FC2301253-001	FC2301253-002	-----	-----	-----	
						Result	Result	---	---	---	
Total Metals											
Barium, total	7440-39-3	E420/CG	A	0.00010	mg/L	0.0167	0.0161	---	---	---	
Beryllium, total	7440-41-7	E420/CG	A	0.000020	mg/L	<0.000020	<0.000020	---	---	---	
Bismuth, total	7440-69-9	E420/CG	A	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Boron, total	7440-42-8	E420/CG	A	0.010	mg/L	0.012	0.013	---	---	---	
Cadmium, total	7440-43-9	E420/CG	A	0.0000050	mg/L	<0.0000050	0.0000094	---	---	---	
Calcium, total	7440-70-2	E420/CG	A	0.050	mg/L	8.27	7.96	---	---	---	
Cesium, total	7440-46-2	E420/CG	A	0.000010	mg/L	<0.000010	0.000028	---	---	---	
Chromium, total	7440-47-3	E420/CG	A	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Cobalt, total	7440-48-4	E420/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Copper, total	7440-50-8	E420/CG	A	0.00050	mg/L	0.00050	0.00095	---	---	---	
Iron, total	7439-89-6	E420/CG	A	0.010	mg/L	<0.010	0.257	---	---	---	
Lead, total	7439-92-1	E420/CG	A	0.000050	mg/L	<0.000050	0.000150	---	---	---	
Lithium, total	7439-93-2	E420/CG	A	0.0010	mg/L	0.0029	0.0035	---	---	---	
Magnesium, total	7439-95-4	E420/CG	A	0.0050	mg/L	2.22	2.45	---	---	---	
Manganese, total	7439-96-5	E420/CG	A	0.00010	mg/L	0.00178	0.00985	---	---	---	
Molybdenum, total	7439-98-7	E420/CG	A	0.000050	mg/L	0.000173	0.000217	---	---	---	
Nickel, total	7440-02-0	E420/CG	A	0.00050	mg/L	<0.00050	0.00060	---	---	---	
Phosphorus, total	7723-14-0	E420/CG	A	0.050	mg/L	<0.050	<0.050	---	---	---	
Potassium, total	7440-09-7	E420/CG	A	0.050	mg/L	0.905	0.965	---	---	---	
Rubidium, total	7440-17-7	E420/CG	A	0.00020	mg/L	0.00095	0.00117	---	---	---	
Selenium, total	7782-49-2	E420/CG	A	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Silicon, total	7440-21-3	E420/CG	A	0.10	mg/L	1.15	1.83	---	---	---	
Silver, total	7440-22-4	E420/CG	A	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Sodium, total	7440-23-5	E420/CG	A	0.050	mg/L	13.7	3.40	---	---	---	
Strontium, total	7440-24-6	E420/CG	A	0.00020	mg/L	0.0490	0.0524	---	---	---	
Sulfur, total	7704-34-9	E420/CG	A	0.50	mg/L	1.22	1.67	---	---	---	
Tellurium, total	13494-80-9	E420/CG	A	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Thallium, total	7440-28-0	E420/CG	A	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Thorium, total	7440-29-1	E420/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Tin, total	7440-31-5	E420/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)						Client sample ID	Treated Water	Raw Water Pond 1	----	----	----
Client sampling date / time						19-May-2023 09:15	19-May-2023 09:20	----	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	FC2301253-001	FC2301253-002	-----	-----	-----		
					Result	Result	---	---	---		
Total Metals											
Titanium, total	7440-32-6	E420/CG	A	0.00030	mg/L	<0.00030	0.00401	---	---	---	
Tungsten, total	7440-33-7	E420/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Uranium, total	7440-61-1	E420/CG	A	0.000010	mg/L	<0.000010	0.000119	---	---	---	
Vanadium, total	7440-62-2	E420/CG	A	0.00050	mg/L	<0.00050	0.00074	---	---	---	
Zinc, total	7440-66-6	E420/CG	A	0.0030	mg/L	<0.0030	<0.0030	---	---	---	
Zirconium, total	7440-67-7	E420/CG	A	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/CG	A	0.0010	mg/L	0.0182	0.0107	---	---	---	
Antimony, dissolved	7440-36-0	E421/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Arsenic, dissolved	7440-38-2	E421/CG	A	0.00010	mg/L	0.00020	0.00036	---	---	---	
Barium, dissolved	7440-39-3	E421/CG	A	0.00010	mg/L	0.0187	0.0167	---	---	---	
Beryllium, dissolved	7440-41-7	E421/CG	A	0.000020	mg/L	<0.000020	<0.000020	---	---	---	
Bismuth, dissolved	7440-69-9	E421/CG	A	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Boron, dissolved	7440-42-8	E421/CG	A	0.010	mg/L	0.011	0.012	---	---	---	
Cadmium, dissolved	7440-43-9	E421/CG	A	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
Calcium, dissolved	7440-70-2	E421/CG	A	0.050	mg/L	7.60	7.17	---	---	---	
Cesium, dissolved	7440-46-2	E421/CG	A	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Chromium, dissolved	7440-47-3	E421/CG	A	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Cobalt, dissolved	7440-48-4	E421/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Copper, dissolved	7440-50-8	E421/CG	A	0.00020	mg/L	0.00044	0.00060	---	---	---	
Iron, dissolved	7439-89-6	E421/CG	A	0.030	mg/L	<0.030	0.036	---	---	---	
Lead, dissolved	7439-92-1	E421/CG	A	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Lithium, dissolved	7439-93-2	E421/CG	A	0.0010	mg/L	0.0022	0.0024	---	---	---	
Magnesium, dissolved	7439-95-4	E421/CG	A	0.0050	mg/L	1.96	2.16	---	---	---	
Manganese, dissolved	7439-96-5	E421/CG	A	0.00500	mg/L	<0.00500	<0.00500	---	---	---	
Molybdenum, dissolved	7439-98-7	E421/CG	A	0.000050	mg/L	0.000188	0.000217	---	---	---	
Nickel, dissolved	7440-02-0	E421/CG	A	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Phosphorus, dissolved	7723-14-0	E421/CG	A	0.050	mg/L	<0.050	<0.050	---	---	---	
Potassium, dissolved	7440-09-7	E421/CG	A	0.050	mg/L	0.845	0.839	---	---	---	
Rubidium, dissolved	7440-17-7	E421/CG	A	0.00020	mg/L	0.00086	0.00077	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)						Client sample ID	Treated Water	Raw Water Pond 1	----	----	----
Client sampling date / time						19-May-2023 09:15	19-May-2023 09:20	----	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	FC2301253-001	FC2301253-002	-----	-----	-----		
					Result	Result	---	---	---		
Dissolved Metals											
Selenium, dissolved	7782-49-2	E421/CG	A	0.000050	mg/L	<0.000050	0.000058	---	---	---	
Silicon, dissolved	7440-21-3	E421/CG	A	0.050	mg/L	1.14	1.54	---	---	---	
Silver, dissolved	7440-22-4	E421/CG	A	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Sodium, dissolved	7440-23-5	E421/CG	A	0.050	mg/L	12.2	2.94	---	---	---	
Strontium, dissolved	7440-24-6	E421/CG	A	0.00020	mg/L	0.0492	0.0516	---	---	---	
Sulfur, dissolved	7704-34-9	E421/CG	A	0.50	mg/L	1.34	1.72	---	---	---	
Tellurium, dissolved	13494-80-9	E421/CG	A	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Thallium, dissolved	7440-28-0	E421/CG	A	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Thorium, dissolved	7440-29-1	E421/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Tin, dissolved	7440-31-5	E421/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Titanium, dissolved	7440-32-6	E421/CG	A	0.00030	mg/L	<0.00030	0.00062	---	---	---	
Tungsten, dissolved	7440-33-7	E421/CG	A	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Uranium, dissolved	7440-61-1	E421/CG	A	0.000010	mg/L	<0.000010	0.000098	---	---	---	
Vanadium, dissolved	7440-62-2	E421/CG	A	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Zinc, dissolved	7440-66-6	E421/CG	A	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
Zirconium, dissolved	7440-67-7	E421/CG	A	0.00030	mg/L	<0.00030	<0.00030	---	---	---	
Dissolved metals filtration location	----	EP421/CG		-	-	Laboratory	Laboratory	---	---	---	
Aggregate Organics											
Naphthenic acids	----	E565-L/EO	B	0.10	mg/L	<0.10	<0.10	---	---	---	
Volatile Organic Compounds [BTEXS+MTBE]											
Benzene	71-43-2	E611A/CG	A	0.50	µg/L	<0.50	<0.50	---	---	---	
Ethylbenzene	100-41-4	E611A/CG	A	0.50	µg/L	<0.50	<0.50	---	---	---	
Toluene	108-88-3	E611A/CG	A	0.50	µg/L	<0.50	<0.50	---	---	---	
Xylene, m+p-	179601-23-1	E611A/CG	A	0.50	µg/L	<0.50	<0.50	---	---	---	
Xylene, o-	95-47-6	E611A/CG	A	0.50	µg/L	<0.50	<0.50	---	---	---	
Xylenes, total	1330-20-7	E611A/CG	A	0.75	µg/L	<0.75	<0.75	---	---	---	
BTEX, total	----	E611A/CG	A	1.2	µg/L	<1.2	<1.2	---	---	---	
Hydrocarbons											
F1 (C6-C10)	----	E581.F1/CG	A	100	µg/L	<100	<100	---	---	---	
F1-BTEX	----	EC580/CG		100	µg/L	<100	<100	---	---	---	



Analytical Results

Sub-Matrix: Water						Client sample ID	Treated Water	Raw Water Pond 1	----	----	----
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Analyte	CAS Number	Method/Lab	LOR	Unit		FC2301253-001	FC2301253-002	-----	-----	-----	
						Result	Result	---	---	---	
Hydrocarbons											
F2 (C10-C16)	---	E601/CG	A	100	µg/L	<100	<100	---	---	---	
F3 (C16-C34)	---	E601/CG	A	250	µg/L	<250	<250	---	---	---	
F4 (C34-C50)	---	E601/CG	A	250	µg/L	<250	<250	---	---	---	
Hydrocarbons, total (C6-C50)	---	EC581/CG		400	µg/L	<400	<400	---	---	---	
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601/CG	A	1.0	%	84.9	85.8	---	---	---	
Dichlorotoluene, 3,4-	95-75-0	E581.F1/CG	A	1.0	%	98.9	101	---	---	---	
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/CG	A	1.0	%	83.0	83.6	---	---	---	
Difluorobenzene, 1,4-	540-36-3	E611A/CG	A	1.0	%	99.3	99.2	---	---	---	
Polycyclic Aromatic Hydrocarbons											
Acenaphthene	83-32-9	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acenaphthylene	208-96-8	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acridine	260-94-6	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Anthracene	120-12-7	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benz(a)anthracene	56-55-3	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(a)pyrene	50-32-8	E641A/CG	A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Benzo(b+j)fluoranthene	n/a	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(b+j+k)fluoranthene	n/a	E641A/CG	A	0.015	µg/L	<0.015	<0.015	---	---	---	
Benzo(g,h,i)perylene	191-24-2	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(k)fluoranthene	207-08-9	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Chrysene	218-01-9	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Dibenz(a,h)anthracene	53-70-3	E641A/CG	A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Fluoranthene	206-44-0	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Fluorene	86-73-7	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1-	90-12-0	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1+2-	---	E641A/CG	A	0.015	µg/L	<0.015	<0.015	---	---	---	
Methylnaphthalene, 2-	91-57-6	E641A/CG	A	0.010	µg/L	<0.010	<0.010	---	---	---	
Naphthalene	91-20-3	E641A/CG	A	0.050	µg/L	<0.050	<0.050	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)						Client sample ID	Treated Water	Raw Water Pond 1	----	----	----
Client sampling date / time						19-May-2023 09:15	19-May-2023 09:20	----	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	FC2301253-001	FC2301253-002	-----	-----	-----		
						Result	Result	---	---	---	
Polycyclic Aromatic Hydrocarbons											
Phenanthrene	85-01-8	E641A/CG	A	0.020	µg/L	<0.020	<0.020	----	----	----	
Pyrene	129-00-0	E641A/CG	A	0.010	µg/L	<0.010	<0.010	----	----	----	
Quinoline	91-22-5	E641A/CG	A	0.050	µg/L	<0.050	<0.050	----	----	----	
B(a)P total potency equivalents [B(a)P TPE]	----	E641A/CG	A	0.010	µg/L	<0.010	<0.010	----	----	----	
PAHs, high molecular weight (BC AWQ)	n/a	E641A/CG	A	0.030	µg/L	<0.030	<0.030	----	----	----	
PAHs, low molecular weight (BC AWQ)	n/a	E641A/CG	A	0.060	µg/L	<0.060	<0.060	----	----	----	
PAHs, total (CCME sewer 18)	n/a	E641A/CG	A	0.070	µg/L	<0.070	<0.070	----	----	----	
PAHs, total (EPA 16)	n/a	E641A/CG	A	0.065	µg/L	<0.065	<0.065	----	----	----	
Polycyclic Aromatic Hydrocarbons Surrogates											
Chrysene-d12	1719-03-5	E641A/CG	A	0.1	%	92.9	87.7	----	----	----	
Naphthalene-d8	1146-65-2	E641A/CG	A	0.1	%	111	106	----	----	----	
Phenanthrene-d10	1517-22-2	E641A/CG	A	0.1	%	90.8	85.9	----	----	----	

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

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



CERTIFICATE OF ANALYSIS

Work Order	: FC2301253	Page	: 1 of 10
Client	: Regional Municipality of Wood Buffalo	Laboratory	: Fort McMurray - Environmental
Contact	: Water Treatment Plant	Account Manager	: Megan Trydal
Address	: 1 Silin Forest Road Fort McMurray AB Canada T9H 5A1	Address	: #4, 340 Macalpine Crescent Fort McMurray AB Canada T9H 4A8
Telephone	: 780-762-5863	Telephone	: +1 780 791 1524
Project	: Fort Chipewyan Imperial Release	Date Samples Received	: 19-May-2023 13:45
PO	: 4500051416	Date Analysis	: 20-May-2023
C-O-C number	: ----	Commenced	
Sampler	: ----	Issue Date	: 25-May-2023 18:01
Site	: Schedule 4: Fort Chip		
Quote number	: Q61323 (Fort chip)		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Andrew Fox		Metals, Calgary, Alberta
Brianna Allen	Production/Validation Manager	Inorganics, Burnaby, British Columbia
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
George Huang	Supervisor - Inorganic	Inorganics, Calgary, Alberta
Kate Dimitrova	Analyst	Inorganics, Burnaby, British Columbia
Maqsood UlHassan	Laboratory Analyst	Organics, Calgary, Alberta
Nguyen Tran	Laboratory Analyst	Organics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Shirley Li	Team Leader - Inorganics	Metals, Calgary, Alberta



General Comments

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

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

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

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

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

LOR: Limit of Reporting (detection limit).

Measurement Uncertainty: The reported uncertainties in this report are expanded uncertainties calculated using a coverage factor of 2, which gives a level of confidence of approximately 95%.

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

Unit	Description
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
psu	practical salinity units

>: greater than.

<: less than.

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

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

Accreditation

Accreditation	Description	Laboratory	Address
A	CALA ISO/IEC 17025:2017	CG Calgary - Environmental	2559 29th Street NE, Calgary, Alberta
B	CALA ISO/IEC 17025:2017	EO Edmonton - Environmental	9450 - 17 Avenue NW, Edmonton, Alberta
C	CALA ISO/IEC 17025:2017	VA Vancouver - Environmental	8081 Lougheed Highway, Burnaby, British Columbia

Applicable accreditations are indicated in the Method/Lab column as superscripts.



Analytical Results

FC2301253-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Treated Water

Client sampling date / time: 19-May-2023 09:15

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot	
Physical Tests									
Hardness (as CaCO ₃), dissolved	----	27.0	0.50	mg/L	EC100/CG	-	21-May-2023	-	
Hardness (as CaCO ₃), from total Ca/Mg	----	29.8	0.50	mg/L	EC100A/CG	-	21-May-2023	-	
Salinity	----	<1.0	1.0	psu	EC100S/VA	-	24-May-2023	-	
Conductivity	----	120	2.0	µS/cm	E100/CG	A	20-May-2023	948624	
pH	----	8.13	0.10	pH units	E108/CG	A	20-May-2023	948623	
Alkalinity, bicarbonate (as HCO ₃)	71-52-3	43.9	1.0	mg/L	E290/CG	A	20-May-2023	948625	
Alkalinity, carbonate (as CO ₃)	3812-32-6	<1.0	1.0	mg/L	E290/CG	A	20-May-2023	948625	
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290/CG	A	20-May-2023	948625	
Alkalinity, total (as CaCO ₃)	----	36.0	2.0	mg/L	E290/CG	A	20-May-2023	948625	
Solids, total dissolved [TDS], calculated	----	62.3	1.0	mg/L	EC103/CG	-	21-May-2023	-	
Anions and Nutrients									
Chloride	16887-00-6	11.9	0.50	mg/L	E235.Cl/CG	A	20-May-2023	948554	
Fluoride	16984-48-8	<0.020	0.020	mg/L	E235.F/CG	A	20-May-2023	948545	
Nitrate (as N)	14797-55-8	<0.020	0.020	mg/L	E235.NO3/CG	A	20-May-2023	948552	
Nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2/CG	A	20-May-2023	948553	
Sulfate (as SO ₄)	14808-79-8	3.08	0.30	mg/L	E235.SO4/CG	A	20-May-2023	948551	
Nitrate + Nitrite (as N)	----	<0.0500	0.05	mg/L	EC235.N+N/CG	-	21-May-2023	948693	
Total Sulfides									
Sulfide, total (as S)	18496-25-8	<0.0015	0.0015	mg/L	E395/VA	C	-	24-May-2023	952860
Ion Balance									
Anion sum	----	1.12	0.10	meq/L	EC101/CG	-	21-May-2023	-	
Cation sum	----	1.09	0.10	meq/L	EC101/CG	-	21-May-2023	-	
Ion balance (APHA)	----	-1.36	0.01	%	EC101/CG	-	21-May-2023	-	
Ion balance (cations/anions)	----	97.3	0.010	%	EC101/CG	-	21-May-2023	-	
Total Metals									
Aluminum, total	7429-90-5	0.0204	0.0030	mg/L	E420/CG	A	21-May-2023	948045	
Antimony, total	7440-36-0	<0.00010	0.00010	mg/L	E420/CG	A	21-May-2023	948045	
Arsenic, total	7440-38-2	0.00024	0.00010	mg/L	E420/CG	A	21-May-2023	948045	
Barium, total	7440-39-3	0.0167	0.00010	mg/L	E420/CG	A	21-May-2023	948045	
Beryllium, total	7440-41-7	<0.000020	0.000020	mg/L	E420/CG	A	21-May-2023	948045	
Bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420/CG	A	21-May-2023	948045	
Boron, total	7440-42-8	0.012	0.010	mg/L	E420/CG	A	21-May-2023	948045	
Cadmium, total	7440-43-9	<0.000050	0.000050	mg/L	E420/CG	A	21-May-2023	948045	
Calcium, total	7440-70-2	8.27	0.050	mg/L	E420/CG	A	21-May-2023	948045	
Cesium, total	7440-46-2	<0.000010	0.000010	mg/L	E420/CG	A	21-May-2023	948045	
Chromium, total	7440-47-3	<0.00050	0.00050	mg/L	E420/CG	A	21-May-2023	948045	
Cobalt, total	7440-48-4	<0.00010	0.00010	mg/L	E420/CG	A	21-May-2023	948045	
Copper, total	7440-50-8	0.00050	0.00050	mg/L	E420/CG	A	21-May-2023	948045	
Iron, total	7439-89-6	<0.010	0.010	mg/L	E420/CG	A	21-May-2023	948045	
Lead, total	7439-92-1	<0.000050	0.000050	mg/L	E420/CG	A	21-May-2023	948045	
Lithium, total	7439-93-2	0.0029	0.0010	mg/L	E420/CG	A	21-May-2023	948045	
Magnesium, total	7439-95-4	2.22	0.0050	mg/L	E420/CG	A	21-May-2023	948045	
Manganese, total	7439-96-5	0.00178	0.00010	mg/L	E420/CG	A	21-May-2023	948045	



Analytical Results

FC2301253-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Treated Water

Client sampling date / time: 19-May-2023 09:15

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Total Metals								
Molybdenum, total	7439-98-7	0.000173	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Nickel, total	7440-02-0	<0.00050	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Phosphorus, total	7723-14-0	<0.050	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Potassium, total	7440-09-7	0.905	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Rubidium, total	7440-17-7	0.00095	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Selenium, total	7782-49-2	<0.000050	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Silicon, total	7440-21-3	1.15	0.10	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Silver, total	7440-22-4	<0.000010	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Sodium, total	7440-23-5	13.7	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Strontium, total	7440-24-6	0.0490	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Sulfur, total	7704-34-9	1.22	0.50	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Thallium, total	7440-28-0	<0.000010	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Thorium, total	7440-29-1	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tin, total	7440-31-5	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Titanium, total	7440-32-6	<0.00030	0.00030	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tungsten, total	7440-33-7	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Uranium, total	7440-61-1	<0.000010	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Vanadium, total	7440-62-2	<0.00050	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Zinc, total	7440-66-6	<0.0030	0.0030	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Zirconium, total	7440-67-7	<0.00020	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Dissolved Metals								
Aluminum, dissolved	7429-90-5	0.0182	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Antimony, dissolved	7440-36-0	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Arsenic, dissolved	7440-38-2	0.00020	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Barium, dissolved	7440-39-3	0.0187	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Boron, dissolved	7440-42-8	0.011	0.010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cadmium, dissolved	7440-43-9	<0.0000050	0.0000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Calcium, dissolved	7440-70-2	7.60	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cesium, dissolved	7440-46-2	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cobalt, dissolved	7440-48-4	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Copper, dissolved	7440-50-8	0.00044	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Iron, dissolved	7439-89-6	<0.030	0.030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Lead, dissolved	7439-92-1	<0.000050	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Lithium, dissolved	7439-93-2	0.0022	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Magnesium, dissolved	7439-95-4	1.96	0.0050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Manganese, dissolved	7439-96-5	<0.00500	0.00500	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Molybdenum, dissolved	7439-98-7	0.000188	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Nickel, dissolved	7440-02-0	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Phosphorus, dissolved	7723-14-0	<0.050	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Potassium, dissolved	7440-09-7	0.845	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Rubidium, dissolved	7440-17-7	0.00086	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046



Analytical Results

FC2301253-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Treated Water

Client sampling date / time: 19-May-2023 09:15

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QC/lot
Dissolved Metals								
Selenium, dissolved	7782-49-2	<0.000050	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Silicon, dissolved	7440-21-3	1.14	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Sodium, dissolved	7440-23-5	12.2	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Strontium, dissolved	7440-24-6	0.0492	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Sulfur, dissolved	7704-34-9	1.34	0.50	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Tellurium, dissolved	13494-80-9	<0.00020	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Thallium, dissolved	7440-28-0	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Thorium, dissolved	7440-29-1	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Titanium, dissolved	7440-32-6	<0.00030	0.00030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Tungsten, dissolved	7440-33-7	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Uranium, dissolved	7440-61-1	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Vanadium, dissolved	7440-62-2	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Zinc, dissolved	7440-66-6	<0.0010	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Zirconium, dissolved	7440-67-7	<0.00030	0.00030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Dissolved metals filtration location	----	Laboratory	-	-	EP421/CG	-	21-May-2023	948046
Aggregate Organics								
Naphthenic acids	----	<0.10	0.10	mg/L	E565-L/EO	B 23-May-2023	23-May-2023	949705
Volatile Organic Compounds [BTEXS+MTBE]								
Benzene	71-43-2	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Toluene	108-88-3	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylene, m+p-	179601-23-1	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylene, o-	95-47-6	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylenes, total	1330-20-7	<0.75	0.75	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
BTEX, total	----	<1.2	1.2	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1/C G	A 20-May-2023	20-May-2023	948350
F1-BTEX	----	<100	100	µg/L	EC580/CG	-	21-May-2023	-
F2 (C10-C16)	----	<100	100	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
F3 (C16-C34)	----	<250	250	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
F4 (C34-C50)	----	<250	250	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
Hydrocarbons, total (C6-C50)	----	<400	400	µg/L	EC581/CG	-	21-May-2023	-
Hydrocarbons Surrogates								
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	84.9	1.0	%	E601/CG	A 20-May-2023	20-May-2023	947999
Dichlorotoluene, 3,4-	95-75-0	98.9	1.0	%	E581.F1/C G	A 20-May-2023	20-May-2023	948350
Volatile Organic Compounds Surrogates								
Bromofluorobenzene, 4-	460-00-4	83.0	1.0	%	E611A/CG	A 20-May-2023	20-May-2023	948349
Difluorobenzene, 1,4-	540-36-3	99.3	1.0	%	E611A/CG	A 20-May-2023	20-May-2023	948349
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	83-32-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Acenaphthylene	208-96-8	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Acridine	260-94-6	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998



Analytical Results

FC2301253-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Treated Water

Client sampling date / time: 19-May-2023 09:15

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLOT
Polycyclic Aromatic Hydrocarbons								
Anthracene	120-12-7	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benz(a)anthracene	56-55-3	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(a)pyrene	50-32-8	<0.0050	0.0050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(b+j)fluoranthene	n/a	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(b+j+k)fluoranthene	n/a	<0.015	0.015	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(g,h,i)perylene	191-24-2	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(k)fluoranthene	207-08-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Chrysene	218-01-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Dibenz(a,h)anthracene	53-70-3	<0.0050	0.0050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Fluoranthene	206-44-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Fluorene	86-73-7	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 1-	90-12-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 1+2-	----	<0.015	0.015	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 2-	91-57-6	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Naphthalene	91-20-3	<0.050	0.050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Phenanthrene	85-01-8	<0.020	0.020	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Pyrene	129-00-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Quinoline	91-22-5	<0.050	0.050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
B(a)P total potency equivalents [B(a)P TPE]	----	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, high molecular weight (BC AWQ)	n/a	<0.030	0.03	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, low molecular weight (BC AWQ)	n/a	<0.060	0.06	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, total (CCME sewer 18)	n/a	<0.070	0.07	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, total (EPA 16)	n/a	<0.065	0.065	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Polycyclic Aromatic Hydrocarbons Surrogates								
Chrysene-d12	1719-03-5	92.9	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998
Naphthalene-d8	1146-65-2	111	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998
Phenanthrene-d10	1517-22-2	90.8	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998

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

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

Analytical Results

FC2301253-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water Pond 1

Client sampling date / time: 19-May-2023 09:20

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLOT
Physical Tests								
Hardness (as CaCO ₃), dissolved	----	26.8	0.50	mg/L	EC100/CG	-	21-May-2023	-
Hardness (as CaCO ₃), from total Ca/Mg	----	30.0	0.50	mg/L	EC100A/CG	-	21-May-2023	-
Salinity	----	<1.0	1.0	psu	EC100S/VA	-	24-May-2023	-
Conductivity	----	73.3	2.0	µS/cm	E100/CG	A 20-May-2023	20-May-2023	948624
pH	----	7.62	0.10	pH units	E108/CG	A 20-May-2023	20-May-2023	948623
Alkalinity, bicarbonate (as HCO ₃)	71-52-3	34.0	1.0	mg/L	E290/CG	A 20-May-2023	20-May-2023	948625



Analytical Results

FC2301253-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water Pond 1

Client sampling date / time: 19-May-2023 09:20

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLOT
Physical Tests								
Alkalinity, carbonate (as CO ₃)	3812-32-6	<1.0	1.0	mg/L	E290/CG	A 20-May-2023	20-May-2023	948625
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290/CG	A 20-May-2023	20-May-2023	948625
Alkalinity, total (as CaCO ₃)	----	27.9	2.0	mg/L	E290/CG	A 20-May-2023	20-May-2023	948625
Solids, total dissolved [TDS], calculated	----	41.4	1.0	mg/L	EC103/CG	-	21-May-2023	-
Anions and Nutrients								
Chloride	16887-00-6	3.17	0.50	mg/L	E235.Cl/CG	A 20-May-2023	20-May-2023	948554
Fluoride	16984-48-8	0.053	0.020	mg/L	E235.F/CG	A 20-May-2023	20-May-2023	948545
Nitrate (as N)	14797-55-8	<0.020	0.020	mg/L	E235.NO3/CG	A 20-May-2023	20-May-2023	948552
Nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2/CG	A 20-May-2023	20-May-2023	948553
Sulfate (as SO ₄)	14808-79-8	4.15	0.30	mg/L	E235.SO4/CG	A 20-May-2023	20-May-2023	948551
Nitrate + Nitrite (as N)	----	<0.0500	0.05	mg/L	EC235.N+N/CG	-	21-May-2023	948693
Total Sulfides								
Sulfide, total (as S)	18496-25-8	<0.0015	0.0015	mg/L	E395/VA	C -	24-May-2023	952860
Ion Balance								
Anion sum	----	0.74	0.10	meq/L	EC101/CG	-	21-May-2023	-
Cation sum	----	0.69	0.10	meq/L	EC101/CG	-	21-May-2023	-
Ion balance (APHA)	----	-3.50	0.01	%	EC101/CG	-	21-May-2023	-
Ion balance (cations/anions)	----	93.2	0.010	%	EC101/CG	-	21-May-2023	-
Total Metals								
Aluminum, total	7429-90-5	0.164	0.0030	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Antimony, total	7440-36-0	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Arsenic, total	7440-38-2	0.00032	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Barium, total	7440-39-3	0.0161	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Beryllium, total	7440-41-7	<0.000020	0.000020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Boron, total	7440-42-8	0.013	0.010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Cadmium, total	7440-43-9	0.0000094	0.0000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Calcium, total	7440-70-2	7.96	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Cesium, total	7440-46-2	0.000028	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Chromium, total	7440-47-3	<0.00050	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Cobalt, total	7440-48-4	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Copper, total	7440-50-8	0.00095	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Iron, total	7439-89-6	0.257	0.010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Lead, total	7439-92-1	0.000150	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Lithium, total	7439-93-2	0.0035	0.0010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Magnesium, total	7439-95-4	2.45	0.0050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Manganese, total	7439-96-5	0.00985	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Molybdenum, total	7439-98-7	0.000217	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Nickel, total	7440-02-0	0.00060	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Phosphorus, total	7723-14-0	<0.050	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Potassium, total	7440-09-7	0.965	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Rubidium, total	7440-17-7	0.00117	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Selenium, total	7782-49-2	<0.000050	0.000050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045



Analytical Results

FC2301253-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water Pond 1

Client sampling date / time: 19-May-2023 09:20

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Total Metals								
Silicon, total	7440-21-3	1.83	0.10	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Silver, total	7440-22-4	<0.000010	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Sodium, total	7440-23-5	3.40	0.050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Strontium, total	7440-24-6	0.0524	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Sulfur, total	7704-34-9	1.67	0.50	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Thallium, total	7440-28-0	<0.000010	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Thorium, total	7440-29-1	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tin, total	7440-31-5	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Titanium, total	7440-32-6	0.00401	0.00030	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Tungsten, total	7440-33-7	<0.00010	0.00010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Uranium, total	7440-61-1	0.000119	0.000010	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Vanadium, total	7440-62-2	0.00074	0.00050	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Zinc, total	7440-66-6	<0.0030	0.0030	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Zirconium, total	7440-67-7	<0.00020	0.00020	mg/L	E420/CG	A 21-May-2023	21-May-2023	948045
Dissolved Metals								
Aluminum, dissolved	7429-90-5	0.0107	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Antimony, dissolved	7440-36-0	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Arsenic, dissolved	7440-38-2	0.00036	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Barium, dissolved	7440-39-3	0.0167	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Boron, dissolved	7440-42-8	0.012	0.010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cadmium, dissolved	7440-43-9	<0.0000050	0.0000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Calcium, dissolved	7440-70-2	7.17	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cesium, dissolved	7440-46-2	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Cobalt, dissolved	7440-48-4	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Copper, dissolved	7440-50-8	0.00060	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Iron, dissolved	7439-89-6	0.036	0.030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Lead, dissolved	7439-92-1	<0.000050	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Lithium, dissolved	7439-93-2	0.0024	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Magnesium, dissolved	7439-95-4	2.16	0.0050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Manganese, dissolved	7439-96-5	<0.00500	0.00500	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Molybdenum, dissolved	7439-98-7	0.000217	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Nickel, dissolved	7440-02-0	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Phosphorus, dissolved	7723-14-0	<0.050	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Potassium, dissolved	7440-09-7	0.839	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Rubidium, dissolved	7440-17-7	0.00077	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Selenium, dissolved	7782-49-2	0.000058	0.000050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Silicon, dissolved	7440-21-3	1.54	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Sodium, dissolved	7440-23-5	2.94	0.050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Strontium, dissolved	7440-24-6	0.0516	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Sulfur, dissolved	7704-34-9	1.72	0.50	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046



Analytical Results

FC2301253-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water Pond 1

Client sampling date / time: 19-May-2023 09:20

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Dissolved Metals								
Tellurium, dissolved	13494-80-9	<0.00020	0.00020	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Thallium, dissolved	7440-28-0	<0.000010	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Thorium, dissolved	7440-29-1	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Titanium, dissolved	7440-32-6	0.00062	0.00030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Tungsten, dissolved	7440-33-7	<0.00010	0.00010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Uranium, dissolved	7440-61-1	0.000098	0.000010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Vanadium, dissolved	7440-62-2	<0.00050	0.00050	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Zinc, dissolved	7440-66-6	<0.0010	0.0010	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Zirconium, dissolved	7440-67-7	<0.00030	0.00030	mg/L	E421/CG	A 21-May-2023	21-May-2023	948046
Dissolved metals filtration location	----	Laboratory	-	-	EP421/CG	-	21-May-2023	948046
Aggregate Organics								
Naphthenic acids	----	<0.10	0.10	mg/L	E565-L/EO	B 23-May-2023	23-May-2023	949705
Volatile Organic Compounds [BTEXS+MTBE]								
Benzene	71-43-2	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Toluene	108-88-3	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylene, m+p-	179601-23-1	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylene, o-	95-47-6	<0.50	0.50	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Xylenes, total	1330-20-7	<0.75	0.75	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
BTEX, total	----	<1.2	1.2	µg/L	E611A/CG	A 20-May-2023	20-May-2023	948349
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1/C	A 20-May-2023	20-May-2023	948350
F1-BTEX	----	<100	100	µg/L	EC580/CG	-	21-May-2023	-
F2 (C10-C16)	----	<100	100	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
F3 (C16-C34)	----	<250	250	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
F4 (C34-C50)	----	<250	250	µg/L	E601/CG	A 20-May-2023	20-May-2023	947999
Hydrocarbons, total (C6-C50)	----	<400	400	µg/L	EC581/CG	-	21-May-2023	-
Hydrocarbons Surrogates								
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	85.8	1.0	%	E601/CG	A 20-May-2023	20-May-2023	947999
Dichlorotoluene, 3,4-	95-75-0	101	1.0	%	E581.F1/C	A 20-May-2023	20-May-2023	948350
Volatile Organic Compounds Surrogates								
Bromofluorobenzene, 4-	460-00-4	83.6	1.0	%	E611A/CG	A 20-May-2023	20-May-2023	948349
Difluorobenzene, 1,4-	540-36-3	99.2	1.0	%	E611A/CG	A 20-May-2023	20-May-2023	948349
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	83-32-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Acenaphthylene	208-96-8	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Acridine	260-94-6	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Anthracene	120-12-7	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benz(a)anthracene	56-55-3	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(a)pyrene	50-32-8	<0.0050	0.0050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(b+j)fluoranthene	n/a	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(b+j+k)fluoranthene	n/a	<0.015	0.015	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Benzo(g,h,i)perylene	191-24-2	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998



Analytical Results

FC2301253-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water Pond 1

Client sampling date / time: 19-May-2023 09:20

Analyte	CAS Number	Result	LOR	Unit	Method/Lab	Prep Date	Analysis Date	QCLot
Polycyclic Aromatic Hydrocarbons								
Benzo(k)fluoranthene	207-08-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Chrysene	218-01-9	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Dibenz(a,h)anthracene	53-70-3	<0.0050	0.0050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Fluoranthene	206-44-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Fluorene	86-73-7	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 1-	90-12-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 1+2-	----	<0.015	0.015	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Methylnaphthalene, 2-	91-57-6	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Naphthalene	91-20-3	<0.050	0.050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Phenanthrene	85-01-8	<0.020	0.020	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Pyrene	129-00-0	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Quinoline	91-22-5	<0.050	0.050	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
B(a)P total potency equivalents [B(a)P TPE]	----	<0.010	0.010	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, high molecular weight (BC AWQ)	n/a	<0.030	0.03	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, low molecular weight (BC AWQ)	n/a	<0.060	0.06	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, total (CCME sewer 18)	n/a	<0.070	0.07	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
PAHs, total (EPA 16)	n/a	<0.065	0.065	µg/L	E641A/CG	A 20-May-2023	20-May-2023	947998
Polycyclic Aromatic Hydrocarbons Surrogates								
Chrysene-d12	1719-03-5	87.7	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998
Naphthalene-d8	1146-65-2	106	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998
Phenanthrene-d10	1517-22-2	85.9	0.1	%	E641A/CG	A 20-May-2023	20-May-2023	947998

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

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