



## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>FC2300673</b>	Page	: 1 of 8
Client	: <b>Regional Municipality of Wood Buffalo</b>	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	: 22-Mar-2023 16:00
PO	: 4500049712	Date Analysis Commenced	: 23-Mar-2023
C-O-C number	: ----	Issue Date	: 29-Mar-2023 16:28
Sampler	: DM		
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>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Andrew Fox		Metals, Calgary, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
George Huang	Supervisor - Inorganic	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
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Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
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Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, 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).

<i>Unit</i>	<i>Description</i>
-	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.

## Workorder Comments

Sulfide analysis was conducted on samples without appropriate preservation. The reported concentrations may have significant negative biases associated with them.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
NAI	Naphthenic Acid Infra-Red peak ratios were anomalous. Reported result may include contribution from non-naphthenic acid interferences.
RRR	Refer to report comments for issues regarding this analysis.



## Analytical Results

Sub-Matrix: Water					Client sample ID	Chamber WTP	WTP Treated Water	---	---	---
(Matrix: Water)					Client sampling date / time	22-Mar-2023 11:50	22-Mar-2023 11:50	---	---	---
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Physical Tests</b>										
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	35.0	36.7	---	---	---	
Salinity	----	EC100S	1.0	psu	<1.0	<1.0	---	---	---	
Conductivity	----	E100	2.0	µS/cm	253	151	---	---	---	
pH	----	E108	0.10	pH units	9.84	8.85	---	---	---	
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	82.1	62.2	---	---	---	
Alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	33.4	3.7	---	---	---	
Alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	---	---	---	
Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	123	57.2	---	---	---	
Solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	160	91.1	---	---	---	
<b>Anions and Nutrients</b>										
Chloride	16887-00-6	E235.Cl	0.50	mg/L	4.41	12.4	---	---	---	
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.064	0.021	---	---	---	
Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.251	0.078	---	---	---	
Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.579	<0.010	---	---	---	
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	5.07	2.99	---	---	---	
Nitrate + Nitrite (as N)	----	EC235.N+N	0.0500	mg/L	0.830	0.0780	---	---	---	
<b>Total Sulfides</b>										
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015 <sup>RRR</sup>	<0.0015 <sup>RRR</sup>	---	---	---	
<b>Ion Balance</b>										
Anion sum	----	EC101	0.10	meq/L	2.75	1.56	---	---	---	
Cation sum	----	EC101	0.10	meq/L	2.99	1.64	---	---	---	
Ion balance (APHA)	----	EC101	0.01	%	4.18	2.50	---	---	---	
Ion balance (cations/anions)	----	EC101	0.010	%	109	105	---	---	---	
<b>Total Metals</b>										
Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.149	0.0185	---	---	---	
Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00027	0.00011	---	---	---	
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0198	0.0192	---	---	---	
Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	---	---	---	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Chamber WTP	WTP Treated Water	----	----	----
Client sampling date / time					22-Mar-2023 11:50	22-Mar-2023 11:50	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Total Metals</b>										
Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Boron, total	7440-42-8	E420	0.010	mg/L	0.020	0.014	---	---	---	
Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000110	<0.0000050 <sup>DTC</sup>	---	---	---	
Calcium, total	7440-70-2	E420	0.050	mg/L	9.39	9.87	---	---	---	
Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000015	<0.000010	---	---	---	
Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00053	<0.00050	---	---	---	
Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Copper, total	7440-50-8	E420	0.00050	mg/L	0.00176	<0.00050	---	---	---	
Iron, total	7439-89-6	E420	0.010	mg/L	0.222	<0.010	---	---	---	
Lead, total	7439-92-1	E420	0.000050	mg/L	0.000294	<0.000050	---	---	---	
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0033	0.0032	---	---	---	
Magnesium, total	7439-95-4	E420	0.0050	mg/L	2.65	2.56	---	---	---	
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0118	0.00580	---	---	---	
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000394	0.000189 <sup>DTC</sup>	---	---	---	
Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00087	<0.00050	---	---	---	
Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
Potassium, total	7440-09-7	E420	0.050	mg/L	1.13	1.05	---	---	---	
Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00133	0.00096	---	---	---	
Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000054	0.000054	---	---	---	
Silicon, total	7440-21-3	E420	0.10	mg/L	2.80	2.32	---	---	---	
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Sodium, total	7440-23-5	E420	0.050	mg/L	51.6	18.8	---	---	---	
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0688	0.0663	---	---	---	
Sulfur, total	7704-34-9	E420	0.50	mg/L	2.44	1.25	---	---	---	
Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00296	<0.00030	---	---	---	
Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Chamber WTP	WTP Treated Water	----	----	----
Client sampling date / time					22-Mar-2023 11:50	22-Mar-2023 11:50	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Total Metals</b>										
Uranium, total	7440-61-1	E420	0.00010	mg/L	0.000095	<0.000010 <sup>DTC</sup>	---	---	---	
Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0063	<0.0030	---	---	---	
Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
<b>Dissolved Metals</b>										
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0270	0.0191	---	---	---	
Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00026	0.00014	---	---	---	
Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0190	0.0196	---	---	---	
Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	0.000037	---	---	---	
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.021	0.016	---	---	---	
Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	0.0000286 <sup>DTC</sup>	---	---	---	
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	9.29	10.0	---	---	---	
Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00119	0.00039	---	---	---	
Iron, dissolved	7439-89-6	E421	0.030	mg/L	0.037	<0.030	---	---	---	
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0035	0.0037	---	---	---	
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.86	2.86	---	---	---	
Manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00514	<0.00500	---	---	---	
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000382	0.000418 <sup>DTC</sup>	---	---	---	
Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00052	<0.00050	---	---	---	
Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	---	---	---	
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.19	1.18	---	---	---	
Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00106	0.00087	---	---	---	
Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000053	0.000092	---	---	---	
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.78	2.56	---	---	---	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Chamber WTP	WTP Treated Water	----	----	----
Client sampling date / time					22-Mar-2023 11:50	22-Mar-2023 11:50	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Dissolved Metals</b>										
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	51.8	20.0	---	---	---	
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0665	0.0683	---	---	---	
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	2.79	1.39	---	---	---	
Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	0.000020	---	---	---	
Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00052	<0.00030	---	---	---	
Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000090	0.000025 <sup>DTC</sup>	---	---	---	
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0022	<0.0010	---	---	---	
Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	---	---	---	
Dissolved metals filtration location	----	EP421	-	-	Laboratory	Laboratory	---	---	---	
<b>Aggregate Organics</b>										
Naphthenic acids	----	E565-L	0.10	mg/L	<0.25 <sup>NAI</sup>	<0.10	---	---	---	
<b>Volatile Organic Compounds [Fuels]</b>										
Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	---	---	---	
Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	---	---	---	
Xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	---	---	---	
BTEX, total	----	E611A	1.0	µg/L	<1.0	<1.0	---	---	---	
<b>Hydrocarbons</b>										
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	---	---	---	
F1-BTEX	----	EC580	25	µg/L	<100	<100	---	---	---	
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	---	---	---	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Chamber WTP	WTP Treated Water	----	----	----
Client sampling date / time					22-Mar-2023 11:50	22-Mar-2023 11:50	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Hydrocarbons</b>										
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	---	---	---	
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	---	---	---	
Hydrocarbons, total (C6-C50)	----	EC581	370	µg/L	<380	<380	---	---	---	
<b>Hydrocarbons Surrogates</b>										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601	1.0	%	97.5	98.7	---	---	---	
Dichlorotoluene, 3,4-	95-75-0	E581.F1	1.0	%	121	121	---	---	---	
<b>Volatile Organic Compounds Surrogates</b>										
Bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	86.1	90.4	---	---	---	
Difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	102	102	---	---	---	
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	---	---	---	
Benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1+2-	----	E641A	0.015	µg/L	<0.015	<0.015	---	---	---	
Methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	---	---	---	
Phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	---	---	---	



## Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Chamber WTP	WTP Treated Water	----	----	----
Client sampling date / time					22-Mar-2023 11:50	22-Mar-2023 11:50	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300673-001	FC2300673-002	-----	-----	-----	
					Result	Result	---	---	---	
<b>Polycyclic Aromatic Hydrocarbons</b>										
Pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	---	---	---	
B(a)P total potency equivalents [B(a)P TPE]	----	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
PAHs, high molecular weight (BC AWQ)	n/a	E641A	0.030	µg/L	<0.030	<0.030	---	---	---	
PAHs, low molecular weight (BC AWQ)	n/a	E641A	0.060	µg/L	<0.060	<0.060	---	---	---	
PAHs, total (CCME sewer 18)	n/a	E641A	0.070	µg/L	<0.070	<0.070	---	---	---	
PAHs, total (EPA 16)	n/a	E641A	0.065	µg/L	<0.065	<0.065	---	---	---	
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>										
Chrysene-d12	1719-03-5	E641A	0.1	%	106	109	---	---	---	
Naphthalene-d8	1146-65-2	E641A	0.1	%	107	117	---	---	---	
Phenanthrene-d10	1517-22-2	E641A	0.1	%	116	117	---	---	---	

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





## CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>FC2300673</b>	Page	: 1 of 10
<b>Client</b>	: <b>Regional Municipality of Wood Buffalo</b>	<b>Laboratory</b>	: Fort McMurray - Environmental
<b>Contact</b>	: Water Treatment Plant	<b>Account Manager</b>	: Megan Trydal
<b>Address</b>	: 1 Silin Forest Road Fort McMurray AB Canada T9H 5A1	<b>Address</b>	: #4, 340 Macalpine Crescent Fort McMurray AB Canada T9H 4A8
<b>Telephone</b>	: 780-762-5863	<b>Telephone</b>	: +1 780 791 1524
<b>Project</b>	: Fort Chipewyan Imperial Release	<b>Date Samples Received</b>	: 22-Mar-2023 16:00
<b>PO</b>	: 4500049712	<b>Date Analysis</b>	: 23-Mar-2023
<b>C-O-C number</b>	: ----	<b>Commenced</b>	
<b>Sampler</b>	: DM	<b>Issue Date</b>	: 29-Mar-2023 16:29
<b>Site</b>	: Schedule 4: Fort Chip		
<b>Quote number</b>	: Q61323 (Fort chip)		
<b>No. of samples received</b>	: 2		
<b>No. of samples analysed</b>	: 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>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Andrew Fox		Metals, Calgary, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
George Huang	Supervisor - Inorganic	Metals, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Inorganics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, Edmonton, 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.

<i>Unit</i>	<i>Description</i>
-	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.

## Workorder Comments

Sulfide analysis was conducted on samples without appropriate preservation. The reported concentrations may have significant negative biases associated with them.

## Qualifiers

<i>Qualifier</i>	<i>Description</i>
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
NAI	Naphthenic Acid Infra-Red peak ratios were anomalous. Reported result may include contribution from non-naphthenic acid interferences.
RRR	Refer to report comments for issues regarding this analysis.



## Analytical Results

FC2300673-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Chamber WTP

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QC/Lot
<b>Physical Tests</b>								
Hardness (as CaCO <sub>3</sub> ), dissolved	----	35.0	0.50	mg/L	EC100	-	26-Mar-2023	-
Salinity	----	<1.0	1.0	psu	EC100S	-	24-Mar-2023	-
Conductivity	----	253	2.0	µS/cm	E100	23-Mar-2023	23-Mar-2023	873956
pH	----	9.84	0.10	pH units	E108	23-Mar-2023	23-Mar-2023	873955
Alkalinity, bicarbonate (as HCO <sub>3</sub> )	71-52-3	82.1	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, carbonate (as CO <sub>3</sub> )	3812-32-6	33.4	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, total (as CaCO <sub>3</sub> )	----	123	2.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Solids, total dissolved [TDS], calculated	----	160	1.0	mg/L	EC103	-	23-Mar-2023	-
<b>Anions and Nutrients</b>								
Chloride	16887-00-6	4.41	0.50	mg/L	E235.Cl	23-Mar-2023	23-Mar-2023	873444
Fluoride	16984-48-8	0.064	0.020	mg/L	E235.F	23-Mar-2023	23-Mar-2023	873441
Nitrate (as N)	14797-55-8	0.251	0.020	mg/L	E235.NO3	23-Mar-2023	23-Mar-2023	873442
Nitrite (as N)	14797-65-0	0.579	0.010	mg/L	E235.NO2	23-Mar-2023	23-Mar-2023	873443
Sulfate (as SO <sub>4</sub> )	14808-79-8	5.07	0.30	mg/L	E235.SO4	23-Mar-2023	23-Mar-2023	873445
Nitrate + Nitrite (as N)	----	0.830	0.05	mg/L	EC235.N+N	-	24-Mar-2023	-
<b>Total Sulfides</b>								
Sulfide, total (as S)	18496-25-8	<0.0015 <sup>RRR</sup>	0.0015	mg/L	E395	-	29-Mar-2023	879599
<b>Ion Balance</b>								
Anion sum	----	2.75	0.10	meq/L	EC101	-	23-Mar-2023	-
Cation sum	----	2.99	0.10	meq/L	EC101	-	23-Mar-2023	-
Ion balance (APHA)	----	4.18	0.01	%	EC101	-	23-Mar-2023	-
Ion balance (cations/anions)	----	109	0.010	%	EC101	-	23-Mar-2023	-
<b>Total Metals</b>								
Aluminum, total	7429-90-5	0.149	0.0030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Antimony, total	7440-36-0	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Arsenic, total	7440-38-2	0.00027	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Barium, total	7440-39-3	0.0198	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Beryllium, total	7440-41-7	<0.000020	0.000020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Boron, total	7440-42-8	0.020	0.010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cadmium, total	7440-43-9	0.0000110	0.0000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Calcium, total	7440-70-2	9.39	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cesium, total	7440-46-2	0.000015	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Chromium, total	7440-47-3	0.00053	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cobalt, total	7440-48-4	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Copper, total	7440-50-8	0.00176	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Iron, total	7439-89-6	0.222	0.010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Lead, total	7439-92-1	0.000294	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Lithium, total	7439-93-2	0.0033	0.0010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Magnesium, total	7439-95-4	2.65	0.0050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Manganese, total	7439-96-5	0.0118	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Molybdenum, total	7439-98-7	0.000394	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Nickel, total	7440-02-0	0.00087	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Phosphorus, total	7723-14-0	<0.050	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Potassium, total	7440-09-7	1.13	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327



## Analytical Results

FC2300673-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Chamber WTP

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Total Metals</b>								
Rubidium, total	7440-17-7	0.00133	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Selenium, total	7782-49-2	0.000054	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Silicon, total	7440-21-3	2.80	0.10	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Silver, total	7440-22-4	<0.000010	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Sodium, total	7440-23-5	51.6	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Strontium, total	7440-24-6	0.0688	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Sulfur, total	7704-34-9	2.44	0.50	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Thallium, total	7440-28-0	<0.000010	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Thorium, total	7440-29-1	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tin, total	7440-31-5	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Titanium, total	7440-32-6	0.00296	0.00030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tungsten, total	7440-33-7	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Uranium, total	7440-61-1	0.000095	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Vanadium, total	7440-62-2	<0.00050	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Zinc, total	7440-66-6	0.0063	0.0030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Zirconium, total	7440-67-7	<0.00020	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
<b>Dissolved Metals</b>								
Aluminum, dissolved	7429-90-5	0.0270	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Antimony, dissolved	7440-36-0	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Arsenic, dissolved	7440-38-2	0.00026	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Barium, dissolved	7440-39-3	0.0190	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Boron, dissolved	7440-42-8	0.021	0.010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cadmium, dissolved	7440-43-9	<0.0000050	0.0000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Calcium, dissolved	7440-70-2	9.29	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cesium, dissolved	7440-46-2	<0.000010	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cobalt, dissolved	7440-48-4	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Copper, dissolved	7440-50-8	0.00119	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Iron, dissolved	7439-89-6	0.037	0.030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Lead, dissolved	7439-92-1	<0.000050	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Lithium, dissolved	7439-93-2	0.0035	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Magnesium, dissolved	7439-95-4	2.86	0.0050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Manganese, dissolved	7439-96-5	0.00514	0.00500	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Molybdenum, dissolved	7439-98-7	0.000382	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Nickel, dissolved	7440-02-0	0.00052	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Phosphorus, dissolved	7723-14-0	<0.050	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Potassium, dissolved	7440-09-7	1.19	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Rubidium, dissolved	7440-17-7	0.00106	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Selenium, dissolved	7782-49-2	0.000053	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Silicon, dissolved	7440-21-3	2.78	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Sodium, dissolved	7440-23-5	51.8	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Strontium, dissolved	7440-24-6	0.0665	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107



## Analytical Results

FC2300673-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Chamber WTP

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Dissolved Metals</b>								
Sulfur, dissolved	7704-34-9	2.79	0.50	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tellurium, dissolved	13494-80-9	<0.00020	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Thallium, dissolved	7440-28-0	<0.000010	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Thorium, dissolved	7440-29-1	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Titanium, dissolved	7440-32-6	0.00052	0.00030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tungsten, dissolved	7440-33-7	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Uranium, dissolved	7440-61-1	0.000090	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Vanadium, dissolved	7440-62-2	<0.00050	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Zinc, dissolved	7440-66-6	0.0022	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Zirconium, dissolved	7440-67-7	<0.00030	0.00030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Dissolved metals filtration location	----	Laboratory	-	-	EP421	-	24-Mar-2023	875107
<b>Aggregate Organics</b>								
Naphthenic acids	----	<0.25 <sup>NAL</sup>	0.25	mg/L	E565-L	23-Mar-2023	23-Mar-2023	873462
<b>Volatile Organic Compounds [Fuels]</b>								
Benzene	71-43-2	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Styrene	100-42-5	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Toluene	108-88-3	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
BTEX, total	----	<1.0	1.0	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
<b>Hydrocarbons</b>								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	23-Mar-2023	23-Mar-2023	873458
F1-BTEX	----	<100	100	µg/L	EC580	-	24-Mar-2023	-
F2 (C10-C16)	----	<100	100	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
F3 (C16-C34)	----	<250	250	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
F4 (C34-C50)	----	<250	250	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
Hydrocarbons, total (C6-C50)	----	<380	380	µg/L	EC581	-	24-Mar-2023	-
<b>Hydrocarbons Surrogates</b>								
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	97.5	1.0	%	E601	23-Mar-2023	23-Mar-2023	873527
Dichlorotoluene, 3,4-	95-75-0	121	1.0	%	E581.F1	23-Mar-2023	23-Mar-2023	873458
<b>Volatile Organic Compounds Surrogates</b>								
Bromofluorobenzene, 4-	460-00-4	86.1	1.0	%	E611A	23-Mar-2023	23-Mar-2023	873457
Diffluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	23-Mar-2023	23-Mar-2023	873457
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	83-32-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Acenaphthylene	208-96-8	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Acridine	260-94-6	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Anthracene	120-12-7	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benz(a)anthracene	56-55-3	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(a)pyrene	50-32-8	<0.0050	0.0050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(b+j)fluoranthene	n/a	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(b+j+k)fluoranthene	n/a	<0.015	0.015	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(g,h,i)perylene	191-24-2	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528



## Analytical Results

FC2300673-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Chamber WTP

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Polycyclic Aromatic Hydrocarbons</b>								
Benzo(k)fluoranthene	207-08-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Chrysene	218-01-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Dibenz(a,h)anthracene	53-70-3	<0.0050	0.0050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Fluoranthene	206-44-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Fluorene	86-73-7	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 1-	90-12-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 1+2-	----	<0.015	0.015	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 2-	91-57-6	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Naphthalene	91-20-3	<0.050	0.050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Phenanthrene	85-01-8	<0.020	0.020	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Pyrene	129-00-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Quinoline	91-22-5	<0.050	0.050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
B(a)P total potency equivalents [B(a)P TPE]	----	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
PAHs, high molecular weight (BC AWQ)	n/a	<0.030	0.03	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
PAHs, low molecular weight (BC AWQ)	n/a	<0.060	0.06	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
PAHs, total (CCME sewer 18)	n/a	<0.070	0.07	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
PAHs, total (EPA 16)	n/a	<0.065	0.065	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>								
Chrysene-d12	1719-03-5	106	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528
Naphthalene-d8	1146-65-2	107	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528
Phenanthrene-d10	1517-22-2	116	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528

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

## Analytical Results

FC2300673-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WTP Treated Water

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>								
Hardness (as CaCO <sub>3</sub> ), dissolved	----	36.7	0.50	mg/L	EC100	-	26-Mar-2023	-
Salinity	----	<1.0	1.0	psu	EC100S	-	24-Mar-2023	-
Conductivity	----	151	2.0	µS/cm	E100	23-Mar-2023	23-Mar-2023	873956
pH	----	8.85	0.10	pH units	E108	23-Mar-2023	23-Mar-2023	873955
Alkalinity, bicarbonate (as HCO <sub>3</sub> )	71-52-3	62.2	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, carbonate (as CO <sub>3</sub> )	3812-32-6	3.7	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Alkalinity, total (as CaCO <sub>3</sub> )	----	57.2	2.0	mg/L	E290	23-Mar-2023	23-Mar-2023	873957
Solids, total dissolved [TDS], calculated	----	91.1	1.0	mg/L	EC103	-	23-Mar-2023	-
<b>Anions and Nutrients</b>								
Chloride	16887-00-6	12.4	0.50	mg/L	E235.Cl	23-Mar-2023	23-Mar-2023	873444
Fluoride	16984-48-8	0.021	0.020	mg/L	E235.F	23-Mar-2023	23-Mar-2023	873441
Nitrate (as N)	14797-55-8	0.078	0.020	mg/L	E235.NO3	23-Mar-2023	23-Mar-2023	873442





## Analytical Results

FC2300673-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WTP Treated Water

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLOT
<b>Anions and Nutrients</b>								
Nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2	23-Mar-2023	23-Mar-2023	873443
Sulfate (as SO4)	14808-79-8	2.99	0.30	mg/L	E235.SO4	23-Mar-2023	23-Mar-2023	873445
Nitrate + Nitrite (as N)	----	0.0780	0.05	mg/L	EC235.N+N	-	24-Mar-2023	-
<b>Total Sulfides</b>								
Sulfide, total (as S)	18496-25-8	<0.0015 <sup>RRR</sup>	0.0015	mg/L	E395	-	29-Mar-2023	879599
<b>Ion Balance</b>								
Anion sum	----	1.56	0.10	meq/L	EC101	-	23-Mar-2023	-
Cation sum	----	1.64	0.10	meq/L	EC101	-	23-Mar-2023	-
Ion balance (APHA)	----	2.50	0.01	%	EC101	-	23-Mar-2023	-
Ion balance (cations/anions)	----	105	0.010	%	EC101	-	23-Mar-2023	-
<b>Total Metals</b>								
Aluminum, total	7429-90-5	0.0185	0.0030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Antimony, total	7440-36-0	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Arsenic, total	7440-38-2	0.00011	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Barium, total	7440-39-3	0.0192	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Beryllium, total	7440-41-7	<0.000020	0.000020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Boron, total	7440-42-8	0.014	0.010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cadmium, total	7440-43-9	<0.0000050 <sup>DTC</sup>	0.0000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Calcium, total	7440-70-2	9.87	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cesium, total	7440-46-2	<0.000010	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Chromium, total	7440-47-3	<0.00050	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Cobalt, total	7440-48-4	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Copper, total	7440-50-8	<0.00050	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Iron, total	7439-89-6	<0.010	0.010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Lead, total	7439-92-1	<0.000050	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Lithium, total	7439-93-2	0.0032	0.0010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Magnesium, total	7439-95-4	2.56	0.0050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Manganese, total	7439-96-5	0.00580	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Molybdenum, total	7439-98-7	0.000189 <sup>DTC</sup>	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Nickel, total	7440-02-0	<0.00050	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Phosphorus, total	7723-14-0	<0.050	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Potassium, total	7440-09-7	1.05	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Rubidium, total	7440-17-7	0.00096	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Selenium, total	7782-49-2	0.000054	0.000050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Silicon, total	7440-21-3	2.32	0.10	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Silver, total	7440-22-4	<0.000010	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Sodium, total	7440-23-5	18.8	0.050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Strontium, total	7440-24-6	0.0663	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Sulfur, total	7704-34-9	1.25	0.50	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Thallium, total	7440-28-0	<0.000010	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Thorium, total	7440-29-1	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tin, total	7440-31-5	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Titanium, total	7440-32-6	<0.00030	0.00030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Tungsten, total	7440-33-7	<0.00010	0.00010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327



## Analytical Results

FC2300673-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WTP Treated Water

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Total Metals</b>								
Uranium, total	7440-61-1	<0.000010 <sup>DTC</sup>	0.000010	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Vanadium, total	7440-62-2	<0.00050	0.00050	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Zinc, total	7440-66-6	<0.0030	0.0030	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
Zirconium, total	7440-67-7	<0.00020	0.00020	mg/L	E420	24-Mar-2023	24-Mar-2023	874327
<b>Dissolved Metals</b>								
Aluminum, dissolved	7429-90-5	0.0191	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Antimony, dissolved	7440-36-0	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Arsenic, dissolved	7440-38-2	0.00014	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Barium, dissolved	7440-39-3	0.0196	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Beryllium, dissolved	7440-41-7	0.000037	0.000020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Boron, dissolved	7440-42-8	0.016	0.010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cadmium, dissolved	7440-43-9	0.0000286 <sup>DTC</sup>	0.0000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Calcium, dissolved	7440-70-2	10.0	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cesium, dissolved	7440-46-2	<0.000010	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Cobalt, dissolved	7440-48-4	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Copper, dissolved	7440-50-8	0.00039	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Iron, dissolved	7439-89-6	<0.030	0.030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Lead, dissolved	7439-92-1	<0.000050	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Lithium, dissolved	7439-93-2	0.0037	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Magnesium, dissolved	7439-95-4	2.86	0.0050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Manganese, dissolved	7439-96-5	<0.00500	0.00500	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Molybdenum, dissolved	7439-98-7	0.000418 <sup>DTC</sup>	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Nickel, dissolved	7440-02-0	<0.00050	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Phosphorus, dissolved	7723-14-0	<0.050	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Potassium, dissolved	7440-09-7	1.18	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Rubidium, dissolved	7440-17-7	0.00087	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Selenium, dissolved	7782-49-2	0.000092	0.000050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Silicon, dissolved	7440-21-3	2.56	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Sodium, dissolved	7440-23-5	20.0	0.050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Strontium, dissolved	7440-24-6	0.0683	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Sulfur, dissolved	7704-34-9	1.39	0.50	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tellurium, dissolved	13494-80-9	<0.00020	0.00020	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Thallium, dissolved	7440-28-0	0.000020	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Thorium, dissolved	7440-29-1	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Titanium, dissolved	7440-32-6	<0.00030	0.00030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Tungsten, dissolved	7440-33-7	<0.00010	0.00010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Uranium, dissolved	7440-61-1	0.000025 <sup>DTC</sup>	0.000010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Vanadium, dissolved	7440-62-2	<0.00050	0.00050	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Zinc, dissolved	7440-66-6	<0.0010	0.0010	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Zirconium, dissolved	7440-67-7	<0.00030	0.00030	mg/L	E421	24-Mar-2023	26-Mar-2023	875107
Dissolved metals filtration location	----	Laboratory	-	-	EP421	-	24-Mar-2023	875107
<b>Aggregate Organics</b>								





## Analytical Results

FC2300673-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: WTP Treated Water

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Aggregate Organics</b>								
Naphthenic acids	----	<0.10	0.10	mg/L	E565-L	23-Mar-2023	23-Mar-2023	873462
<b>Volatile Organic Compounds [Fuels]</b>								
Benzene	71-43-2	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Styrene	100-42-5	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Toluene	108-88-3	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
Xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
BTEX, total	----	<1.0	1.0	µg/L	E611A	23-Mar-2023	23-Mar-2023	873457
<b>Hydrocarbons</b>								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	23-Mar-2023	23-Mar-2023	873458
F1-BTEX	----	<100	100	µg/L	EC580	-	24-Mar-2023	-
F2 (C10-C16)	----	<100	100	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
F3 (C16-C34)	----	<250	250	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
F4 (C34-C50)	----	<250	250	µg/L	E601	23-Mar-2023	23-Mar-2023	873527
Hydrocarbons, total (C6-C50)	----	<380	380	µg/L	EC581	-	24-Mar-2023	-
<b>Hydrocarbons Surrogates</b>								
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	98.7	1.0	%	E601	23-Mar-2023	23-Mar-2023	873527
Dichlorotoluene, 3,4-	95-75-0	121	1.0	%	E581.F1	23-Mar-2023	23-Mar-2023	873458
<b>Volatile Organic Compounds Surrogates</b>								
Bromofluorobenzene, 4-	460-00-4	90.4	1.0	%	E611A	23-Mar-2023	23-Mar-2023	873457
Difluorobenzene, 1,4-	540-36-3	102	1.0	%	E611A	23-Mar-2023	23-Mar-2023	873457
<b>Polycyclic Aromatic Hydrocarbons</b>								
Acenaphthene	83-32-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Acenaphthylene	208-96-8	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Acridine	260-94-6	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Anthracene	120-12-7	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benz(a)anthracene	56-55-3	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(a)pyrene	50-32-8	<0.0050	0.0050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(b+j)fluoranthene	n/a	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(b+j+k)fluoranthene	n/a	<0.015	0.015	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(g,h,i)perylene	191-24-2	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Benzo(k)fluoranthene	207-08-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Chrysene	218-01-9	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Dibenz(a,h)anthracene	53-70-3	<0.0050	0.0050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Fluoranthene	206-44-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Fluorene	86-73-7	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 1-	90-12-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 1+2-	----	<0.015	0.015	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Methylnaphthalene, 2-	91-57-6	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Naphthalene	91-20-3	<0.050	0.050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Phenanthrene	85-01-8	<0.020	0.020	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Pyrene	129-00-0	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
Quinoline	91-22-5	<0.050	0.050	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528



## Analytical Results

FC2300673-002

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: WTP Treated Water

Client sampling date / time: 22-Mar-2023 11:50

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Polycyclic Aromatic Hydrocarbons</b>								
<b>B(a)P total potency equivalents [B(a)P TPE]</b>	----	<0.010	0.010	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>PAHs, high molecular weight (BC AWQ)</b>	n/a	<0.030	0.03	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>PAHs, low molecular weight (BC AWQ)</b>	n/a	<0.060	0.06	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>PAHs, total (CCME sewer 18)</b>	n/a	<0.070	0.07	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>PAHs, total (EPA 16)</b>	n/a	<0.065	0.065	µg/L	E641A	23-Mar-2023	23-Mar-2023	873528
<b>Polycyclic Aromatic Hydrocarbons Surrogates</b>								
<b>Chrysene-d12</b>	1719-03-5	109	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528
<b>Naphthalene-d8</b>	1146-65-2	117	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528
<b>Phenanthrene-d10</b>	1517-22-2	117	0.1	%	E641A	23-Mar-2023	23-Mar-2023	873528

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