

CERTIFICATE OF ANALYSIS

REPORTED TO The Water Guy
600 Industrial Road 1, Unit #12 & #13
CRANBROOK, BC V1C 3R1

ATTENTION Al Schaeffer

PO NUMBER

PROJECT A5426673

PROJECT INFO

WORK ORDER 24H0785

RECEIVED / TEMP 2024-08-07 14:02 / 18.9°C

REPORTED 2024-08-23 15:46

COC NUMBER No Number

Introduction:

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Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



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If you have any questions or concerns, please contact me at TeamCaro@caro.ca

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TEST RESULTS

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WORK ORDER REPORTED 24H0785
2024-08-23 15:46

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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2 - Wasa - Mid Lake (24H0785-01) | Matrix: Water | Sampled: 2024-08-06 15:00

Acid Herbicides

2,4-D	< 0.10	MAC = 100	0.10	µg/L	2024-08-14	
2,4-DB	< 0.10	N/A	0.10	µg/L	2024-08-14	
Dichlorprop (2,4-DP)	< 0.10	N/A	0.10	µg/L	2024-08-14	
Fenoprop	< 0.10	N/A	0.10	µg/L	2024-08-14	
MCPA	< 0.02	MAC = 350	0.02	µg/L	2024-08-14	
MCPB	< 0.10	N/A	0.10	µg/L	2024-08-14	
2,4,5-T	< 0.10	N/A	0.10	µg/L	2024-08-14	
MCPB	< 0.10	N/A	0.10	µg/L	2024-08-14	
Acifluorfen	< 0.10	N/A	0.10	µg/L	2024-08-14	
Bentazon	< 0.10	N/A	0.10	µg/L	2024-08-14	
Chloramben	< 0.10	N/A	0.10	µg/L	2024-08-14	
Dicamba	< 0.10	MAC = 110	0.10	µg/L	2024-08-14	
Triclopyr	< 0.10	N/A	0.10	µg/L	2024-08-14	
Picloram	< 0.10	MAC = 190	0.10	µg/L	2024-08-14	
Clopyralid	< 0.10	N/A	0.10	µg/L	2024-08-14	
Bromoxynil	< 0.10	MAC = 30	0.10	µg/L	2024-08-14	
Dinoseb	< 0.10	N/A	0.10	µg/L	2024-08-14	

Anions

Chloride	7.33	AO ≤ 250	0.10	mg/L	2024-08-09	
Fluoride	0.23	MAC = 1.5	0.10	mg/L	2024-08-09	
Nitrate (as N)	< 0.010	MAC = 10	0.010	mg/L	2024-08-09	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2024-08-09	
Sulfate	49.3	AO ≤ 500	1.0	mg/L	2024-08-09	

BCMOE Aggregate Hydrocarbons

VHw (6-10)	< 100	N/A	100	µg/L	2024-08-12	
VPHw	< 100	N/A	100	µg/L	N/A	
EPHw10-19	< 250	N/A	250	µg/L	2024-08-11	
EPHw19-32	< 250	N/A	250	µg/L	2024-08-11	
LEPHw	< 250	N/A	250	µg/L	N/A	
HEPHw	< 250	N/A	250	µg/L	N/A	
Surrogate: 2-Methylnonane (EPH/F2-4)	131		60-140	%	2024-08-11	

Calculated Parameters

Hardness, Total (as CaCO3)	241	None Required	0.500	mg/L	N/A	
Langelier Index	0.5	N/A	-5.0		2024-08-13	CT6
Nitrogen, Organic	0.560	N/A	0.0500	mg/L	N/A	
Solids, Total Dissolved	262	AO ≤ 500	1.00	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	200	N/A	1.0	mg/L	2024-08-09	
Alkalinity, Phenolphthalein (as CaCO3)	11.7	N/A	1.0	mg/L	2024-08-09	
Alkalinity, Bicarbonate (as CaCO3)	177	N/A	1.0	mg/L	2024-08-09	

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2 - Wasa - Mid Lake (24H0785-01) | Matrix: Water | Sampled: 2024-08-06 15:00, Continued

General Parameters, Continued

Alkalinity, Carbonate (as CaCO ₃)	23.4	N/A	1.0	mg/L	2024-08-09	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	1.0	mg/L	2024-08-09	
Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2024-08-12	
Carbon, Total Organic	2.99	N/A	0.50	mg/L	2024-08-09	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2024-08-09	
Conductivity (EC)	468	N/A	2.0	µS/cm	2024-08-09	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2024-08-09	
Nitrogen, Total Kjeldahl	0.560	N/A	0.050	mg/L	2024-08-12	
pH	8.52	7.0-10.5	0.10	pH units	2024-08-09	HT2
Phosphorus, Total (as P)	0.0173	N/A	0.0050	mg/L	2024-08-09	
Temperature, at pH	21.0	N/A		°C	2024-08-09	HT2
Turbidity	1.02	OG < 1	0.10	NTU	2024-08-09	
UV Transmittance @ 254 nm - Unfiltered	91.2	N/A	0.10	% T	2024-08-09	

Microbiological Parameters

Microcystin, total	0.12	MAC = 1.5	0.05	µg/L	2024-08-19	
Coliforms, Total	Overgrown with	MAC = 0	1	CFU/100 mL	2024-08-07	MIC4
E. coli	Overgrown with	MAC = 0	1	CFU/100 mL	2024-08-07	MIC13

Polycyclic Aromatic Hydrocarbons (PAH)

Acenaphthene	< 0.050	N/A	0.050	µg/L	2024-08-11	
Acenaphthylene	< 0.200	N/A	0.200	µg/L	2024-08-11	
Acridine	< 0.050	N/A	0.050	µg/L	2024-08-11	
Anthracene	< 0.010	N/A	0.010	µg/L	2024-08-11	
Benz(a)anthracene	< 0.010	N/A	0.010	µg/L	2024-08-11	
Benzo(a)pyrene	< 0.010	MAC = 0.04	0.010	µg/L	2024-08-11	
Benzo(b+j)fluoranthene	< 0.050	N/A	0.050	µg/L	2024-08-11	
Benzo(g,h,i)perylene	< 0.050	N/A	0.050	µg/L	2024-08-11	
Benzo(k)fluoranthene	< 0.050	N/A	0.050	µg/L	2024-08-11	
2-Chloronaphthalene	< 0.100	N/A	0.100	µg/L	2024-08-11	
Chrysene	< 0.050	N/A	0.050	µg/L	2024-08-11	
Dibenz(a,h)anthracene	< 0.010	N/A	0.010	µg/L	2024-08-11	
Fluoranthene	< 0.030	N/A	0.030	µg/L	2024-08-11	
Fluorene	< 0.050	N/A	0.050	µg/L	2024-08-11	
Indeno(1,2,3-cd)pyrene	< 0.050	N/A	0.050	µg/L	2024-08-11	
1-Methylnaphthalene	< 0.100	N/A	0.100	µg/L	2024-08-11	
2-Methylnaphthalene	< 0.100	N/A	0.100	µg/L	2024-08-11	
Naphthalene	< 0.200	N/A	0.200	µg/L	2024-08-11	
Phenanthrene	< 0.100	N/A	0.100	µg/L	2024-08-11	
Pyrene	< 0.020	N/A	0.020	µg/L	2024-08-11	
Quinoline	< 0.050	N/A	0.050	µg/L	2024-08-11	
Surrogate: Acridine-d9	85		50-140	%	2024-08-11	

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2 - Wasa - Mid Lake (24H0785-01) | Matrix: Water | Sampled: 2024-08-06 15:00, Continued

Polycyclic Aromatic Hydrocarbons (PAH), Continued

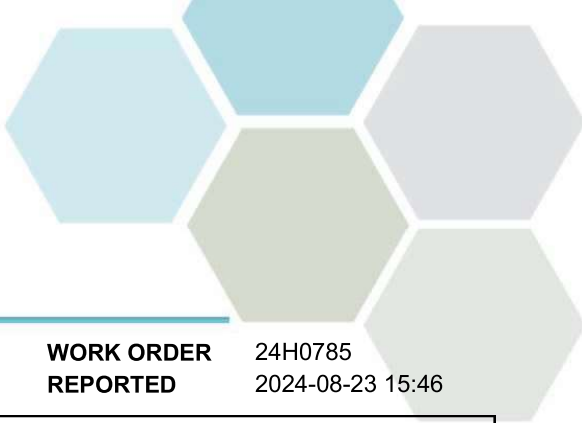
Surrogate: Naphthalene-d8	119		50-140	%	2024-08-11	
Surrogate: Perylene-d12	84		50-140	%	2024-08-11	

Total Metals

Aluminum, total	0.0141	OG < 0.1	0.0050	mg/L	2024-08-11	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2024-08-11	
Arsenic, total	0.00094	MAC = 0.01	0.00050	mg/L	2024-08-11	
Barium, total	0.0235	MAC = 2	0.0050	mg/L	2024-08-11	
Boron, total	< 0.0500	MAC = 5	0.0500	mg/L	2024-08-11	
Cadmium, total	< 0.000010	MAC = 0.007	0.000010	mg/L	2024-08-11	
Calcium, total	20.6	None Required	0.20	mg/L	2024-08-11	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2024-08-11	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2024-08-11	
Copper, total	< 0.00040	MAC = 2	0.00040	mg/L	2024-08-11	
Iron, total	0.017	AO ≤ 0.3	0.010	mg/L	2024-08-11	
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2024-08-11	
Magnesium, total	46.1	None Required	0.010	mg/L	2024-08-11	
Manganese, total	0.00482	MAC = 0.12	0.00020	mg/L	2024-08-11	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2024-08-12	
Molybdenum, total	0.00051	N/A	0.00010	mg/L	2024-08-11	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2024-08-11	
Potassium, total	1.97	N/A	0.10	mg/L	2024-08-11	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2024-08-11	
Sodium, total	14.7	AO ≤ 200	0.10	mg/L	2024-08-11	
Strontium, total	0.0941	MAC = 7	0.0010	mg/L	2024-08-11	
Uranium, total	0.00149	MAC = 0.02	0.000020	mg/L	2024-08-11	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2024-08-11	

Volatile Organic Compounds (VOC)

Benzene	< 0.5	MAC = 5	0.5	µg/L	2024-08-12	
Ethylbenzene	< 1.0	AO ≤ 1.6	1.0	µg/L	2024-08-12	
Methyl tert-butyl ether	< 1.0	AO ≤ 15	1.0	µg/L	2024-08-12	
Styrene	< 1.0	N/A	1.0	µg/L	2024-08-12	
Toluene	< 1.0	MAC = 60	1.0	µg/L	2024-08-12	
Xylenes (total)	< 2.0	AO ≤ 20	2.0	µg/L	2024-08-12	
Surrogate: Toluene-d8	99		70-130	%	2024-08-12	
Surrogate: 4-Bromofluorobenzene	79		70-130	%	2024-08-12	



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Sample Qualifiers:	
CT6	Results were based on lab temperature & lab pH.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
MIC13	Overgrown; E. coli was detected.
MIC4	Overgrown; Total Coliforms were detected.

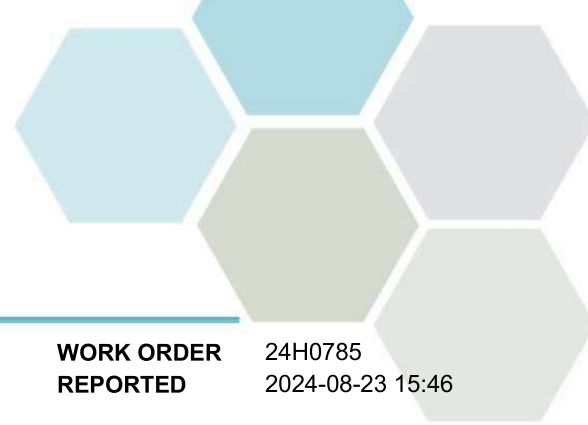
APPENDIX 1: SUPPORTING INFORMATION

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Analysis Description	Method Ref.	Technique	Accredited	Location
Acid Herbicides in Water in Water	In-House	N/A	✓	Richmond
Alkalinity in Water	SM 2320 B* (2021)	Titration with H ₂ SO ₄	✓	Kelowna
Ammonia, Total in Water	SM 4500-NH ₃ G* (2021)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
BTEX in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	✓	Richmond
Carbon, Total Organic in Water	SM 5310 B (2022)	Combustion, Infrared CO ₂ Detection	✓	Kelowna
Coliforms, Total in Water	SM 9222* (2015)	Membrane Filtration / Chromocult Agar	✓	Kelowna
Colour, True in Water	SM 2120 C (2021)	Spectrophotometry (456 nm)	✓	Kelowna
Conductivity in Water	SM 2510 B (2021)	Conductivity Meter	✓	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	✓	Kelowna
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)	✓	Sublet
E. coli in Water	SM 9222* (2015)	Membrane Filtration / Chromocult Agar	✓	Kelowna
EPH in Water	EPA 3511* / BCMOE EPHw	Hexane MicroExtraction (Base/Neutral) / Gas Chromatography (GC-FID)	✓	Richmond
Hardness in Water	SM 2340 B* (2021)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
HEPHw in Water	BCMOE LEPH/HEPH	Calculation		N/A
Langelier Index in Water	SM 2330 B (2021)	Calculation		N/A
LEPHw in Water	BCMOE LEPH/HEPH	Calculation		N/A
Mercury, total in Water	EPA 245.7*	BrCl ₂ Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2021)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2021)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Polycyclic Aromatic Hydrocarbons in Water	EPA 3511* / EPA 8270D	Hexane MicroExtraction (Base/Neutral) / GC-MSD (SIM)	✓	Richmond
Solids, Total Dissolved in Water	SM 1030 E (2021)	SM 1030 E		N/A
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO ₃ +HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm - Unfiltered in Water	SM 5910 B* (2021)	Ultraviolet Absorption	✓	Kelowna
Turbidity in Water	SM 2130 B (2020)	Nephelometry	✓	Kelowna
VH in Water	EPA 5030B / BCMOE VHw	Purge&Trap / Gas Chromatography (GC-FID)	✓	Richmond
VPHw in Water	BCMOE VPH	Calculation: VH - (Benzene + Toluene + Ethylbenzene + Xylenes + Styrene)		N/A

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method



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Glossary of Terms:

RL	Reporting Limit (default)
% T	Percent Transmittance
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
°C	Degrees Celcius
AO	Aesthetic Objective
CFU/100 mL	Colony Forming Units per 100 millilitres
CU	Colour Units (referenced against a platinum cobalt standard)
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre
ASTM	ASTM International Test Methods
BCMOE	British Columbia Environmental Laboratory Manual, British Columbia Ministry of Environment
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

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