CERTIFICATE OF ANALYSIS

REPORTED TO	Stettler, Town of (Alberta) 5031 - 50 Street Stettler, AB T0C 2L0		
ATTENTION	Veronica Salmon	**WORK ORDER**	9010672
PO NUMBER		**RECEIVED / TEMP**	2019-01-10 09:45 / 9°C
PROJECT	Distribution System - Biannual Analysis	**REPORTED**	2019-01-31 17:10
PROJECT INFO		**COC NUMBER**	08264

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

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

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at

Authorized By:

Alexander Dobbie
Client Service Representative

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Stettler, Town of (Alberta)	**WORK ORDER**	9010672
PROJECT	Distribution System - Biannual Analysis	**REPORTED**	2019-01-31 17:10

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
G.T. Hydraulic (9010672-01) | Matrix: Water | Sampled: 2019-01-09 10:15						
Acid Herbicides						
2,4-D	< 0.00010	MAC = 0.1	0.00010	mg/L	2019-01-28	
Dicamba	< 0.00010	MAC = 0.12	0.00010	mg/L	2019-01-28	
MCPA	< 0.00020	MAC = 0.1	0.00020	mg/L	2019-01-28	
Picloram	< 0.00010	MAC = 0.19	0.00010	mg/L	2019-01-28	
Anions						
Bromate	< 0.010	MAC = 0.01	0.010	mg/L	2019-01-11	
Chlorate	< 0.50	MAC = 1	0.50	mg/L	2019-01-11	
Chloride	**9.83**	AO ≤ 250	0.50	mg/L	2019-01-11	
Chlorite	< 0.50	MAC = 1	0.50	mg/L	2019-01-11	
Fluoride	**0.81**	MAC = 1.5	0.10	mg/L	2019-01-11	
Nitrate (as N)	**0.232**	MAC = 10	0.050	mg/L	2019-01-11	
Nitrite (as N)	< 0.050	MAC = 1	0.050	mg/L	2019-01-11	
Sulfate	**72.6**	AO ≤ 500	1.0	mg/L	2019-01-11	
Calculated Parameters						
Total Trihalomethanes	**0.0532**	MAC = 0.1	0.00400	mg/L	N/A	
Chloramines	**1.39**	MAC = 3	0.0200	mg/L	N/A	
Hardness, Total (as CaCO3)	**220**	None Required	0.500	mg/L	N/A	
Ion Balance	**92.4**	N/A		%	N/A	
Nitrate+Nitrite (as N)	**0.232**	N/A	0.0500	mg/L	N/A	
Solids, Total Dissolved	**290**	AO ≤ 500	2.00	mg/L	N/A	
Chlorinated Phenols						
2,4-Dichlorophenol	< 0.00020	AO ≤ 0.0003	0.00020	mg/L	2019-01-18	
2,4,6-Trichlorophenol	< 0.00050	AO ≤ 0.002	0.00050	mg/L	2019-01-18	
2,3,4,6-Tetrachlorophenol	< 0.00050	AO ≤ 0.001	0.00050	mg/L	2019-01-18	
Pentachlorophenol	< 0.00050	AO ≤ 0.03	0.00050	mg/L	2019-01-18	
Dissolved Metals						
Calcium, dissolved	**57.2**	N/A	0.20	mg/L	2019-01-23	
Iron, dissolved	< 0.010	N/A	0.010	mg/L	2019-01-23	
Magnesium, dissolved	**18.8**	N/A	0.010	mg/L	2019-01-23	
Manganese, dissolved	**0.00104**	N/A	0.00020	mg/L	2019-01-23	
Potassium, dissolved	**1.77**	N/A	0.10	mg/L	2019-01-23	
Sodium, dissolved	**15.6**	N/A	0.10	mg/L	2019-01-23	
General Parameters						
Alkalinity, Total (as CaCO3)	**185**	N/A	2.0	mg/L	2019-01-11	
Bicarbonate (HCO3)	**226**	N/A	2.0	mg/L	2019-01-11	
Carbonate (CO3)	< 2.0	N/A	2.0	mg/L	2019-01-11	
Hydroxide (OH)	< 2.0	N/A	2.0	mg/L	2019-01-11	
Ammonia, Total (as N)	**0.534**	None Required	0.050	mg/L	2019-01-16	
Carbon, Total Organic	**2.36**	N/A	0.50	mg/L	2019-01-17	

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
G.T. Hydraulic (9010672-01) | Matrix: Water | Sampled: 2019-01-09 10:15, Continued						
General Parameters, Continued						
Chlorine, Total	**1.46**	None Required	0.02	mg/L	2019-01-11	HT2
Chlorine, Free	**0.07**	N/A	0.02	mg/L	2019-01-11	HT2
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2019-01-10	
Conductivity (EC)	**509**	N/A	2.0	µS/cm	2019-01-16	
Cyanide, Free	< 0.0050	MAC = 0.2	0.0050	mg/L	2019-01-24	
Nitrilotriacetic Acid	< 0.20	MAC = 0.4	0.20	mg/L	2019-01-16	
pH	**7.48**	7.0-10.5	0.10	pH units	2019-01-11	HT1
Sulfide, Total	< 0.020	AO ≤ 0.05	0.020	mg/L	2019-01-11	
Turbidity	< 0.10	OG < 1	0.10	NTU	2019-01-10	
Microbiological Parameters						
Microcystin, total	< 0.00014	MAC = 0.0015	0.00014	mg/L	2019-01-11	
Miscellaneous Herbicides						
Glyphosate	< 0.050	MAC = 0.28	0.050	mg/L	2019-01-23	
Pesticides, Herbicides, and Fungicides						
Atrazine and metabolites	< 0.000100	MAC = 0.005	0.000100	mg/L	2019-01-17	
Azinphos-methyl	< 0.000200	MAC = 0.02	0.000200	mg/L	2019-01-17	
Bromoxynil	< 0.000200	MAC = 0.005	0.000200	mg/L	2019-01-17	
Chlorpyrifos	< 0.000010	MAC = 0.09	0.000010	mg/L	2019-01-17	
Cyanazine	< 0.000100	N/A	0.000100	mg/L	2019-01-17	
Diazinon	< 0.000020	MAC = 0.02	0.000020	mg/L	2019-01-17	
Diclofop-methyl	< 0.000100	MAC = 0.009	0.000100	mg/L	2019-01-17	
Dimethoate	< 0.000200	MAC = 0.02	0.000200	mg/L	2019-01-17	
Diuron	< 0.000200	MAC = 0.15	0.000200	mg/L	2019-01-17	
Malathion	< 0.000100	MAC = 0.19	0.000100	mg/L	2019-01-17	
Methoxychlor	< 0.000050	N/A	0.000050	mg/L	2019-01-17	
Metolachlor	< 0.000100	MAC = 0.05	0.000100	mg/L	2019-01-17	
Metribuzin	< 0.000200	MAC = 0.08	0.000200	mg/L	2019-01-17	
Phorate	< 0.000100	MAC = 0.002	0.000100	mg/L	2019-01-17	
Simazine	< 0.000200	MAC = 0.01	0.000200	mg/L	2019-01-17	
Terbufos	< 0.000100	MAC = 0.001	0.000100	mg/L	2019-01-17	
Triallate	< 0.000100	N/A	0.000100	mg/L	2019-01-17	
Trifluralin	< 0.000200	MAC = 0.045	0.000200	mg/L	2019-01-17	
Polycyclic Aromatic Hydrocarbons (PAH)						
Benzo(a)pyrene	**0.031**	MAC = 0.04	0.010	µg/L	2019-01-14	
Total Metals						
Aluminum, total	**0.0354**	OG < 0.1	0.0050	mg/L	2019-01-30	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2019-01-30	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2019-01-30	
Barium, total	**0.0867**	MAC = 1	0.0050	mg/L	2019-01-30	

CARO ANALYTICAL SERVICES

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
G.T. Hydraulic (9010672-01) | Matrix: Water | Sampled: 2019-01-09 10:15, Continued						
Total Metals, Continued						
Boron, total	**0.0228**	MAC = 5	0.0050	mg/L	2019-01-30	
Cadmium, total	< 0.010	MAC = 5	0.010	µg/L	2019-01-30	
Calcium, total	**60.9**	None Required	0.20	mg/L	2019-01-30	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2019-01-30	
Copper, total	**0.0263**	AO ≤ 1	0.00040	mg/L	2019-01-30	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2019-01-30	
Lead, total	**0.00072**	MAC = 0.01	0.00020	mg/L	2019-01-30	
Magnesium, total	**20.1**	None Required	0.010	mg/L	2019-01-30	
Manganese, total	**0.00126**	AO ≤ 0.05	0.00020	mg/L	2019-01-30	
Mercury, total	< 0.010	MAC = 1	0.010	µg/L	2019-01-23	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2019-01-30	
Silicon, total	**1.3**	N/A	1.0	mg/L	2019-01-30	
Silver, total	< 0.050	N/A	0.050	µg/L	2019-01-30	
Sodium, total	**17.0**	AO ≤ 200	0.10	mg/L	2019-01-30	
Uranium, total	**0.698**	MAC = 20	0.020	µg/L	2019-01-30	
Zinc, total	**0.0112**	AO ≤ 5	0.0040	mg/L	2019-01-30	
Volatile Organic Compounds (VOC)						S03
Benzene	< 0.0005	MAC = 0.005	0.0005	mg/L	2019-01-17	
Bromodichloromethane	**0.0054**	N/A	0.0010	mg/L	2019-01-17	
Bromoform	**0.0206**	N/A	0.0010	mg/L	2019-01-17	
Carbon tetrachloride	< 0.0005	MAC = 0.002	0.0005	mg/L	2019-01-17	
Monochlorobenzene	< 0.0010	AO ≤ 0.03	0.0010	mg/L	2019-01-17	
Chloroform	**0.0218**	N/A	0.0010	mg/L	2019-01-17	
Dibromochloromethane	**0.0055**	N/A	0.0010	mg/L	2019-01-17	
1,2-Dichlorobenzene	< 0.0005	AO ≤ 0.003	0.0005	mg/L	2019-01-17	
1,4-Dichlorobenzene	< 0.0010	AO ≤ 0.001	0.0010	mg/L	2019-01-17	
1,2-Dichloroethane	< 0.0010	MAC = 0.005	0.0010	mg/L	2019-01-17	
1,1-Dichloroethylene	< 0.0010	MAC = 0.014	0.0010	mg/L	2019-01-17	
Dichloromethane	< 0.0030	MAC = 0.05	0.0030	mg/L	2019-01-17	
Ethylbenzene	< 0.0010	AO ≤ 0.0016	0.0010	mg/L	2019-01-17	
Methyl tert-butyl ether	< 0.0010	AO ≤ 0.015	0.0010	mg/L	2019-01-17	
Tetrachloroethylene	< 0.0010	MAC = 0.01	0.0010	mg/L	2019-01-17	
Toluene	< 0.0010	AO ≤ 0.024	0.0010	mg/L	2019-01-17	
Trichloroethylene	< 0.0010	MAC = 0.005	0.0010	mg/L	2019-01-17	
Vinyl chloride	< 0.0010	MAC = 0.002	0.0010	mg/L	2019-01-17	
Xylenes (total)	< 0.0020	AO ≤ 0.02	0.0020	mg/L	2019-01-17	
Town Shop (9010672-02) | Matrix: Water | Sampled: 2019-01-09 09:30						
Calculated Parameters						
Total Trihalomethanes	**0.0324**	MAC = 0.1	0.00400	mg/L	N/A	

TEST RESULTS

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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Town Shop (9010672-02) | Matrix: Water | Sampled: 2019-01-09 09:30, Continued						
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0030**	N/A	0.0010	mg/L	2019-01-17	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2019-01-17	
Chloroform	**0.0295**	N/A	0.0010	mg/L	2019-01-17	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2019-01-17	
Surrogate: Toluene-d8	*91*		*70-130*	%	*2019-01-17*	
Surrogate: 4-Bromofluorobenzene	*87*		*70-130*	%	*2019-01-17*	
Turtle Club (9010672-03) | Matrix: Water | Sampled: 2019-01-09 10:05						
Calculated Parameters						
Total Trihalomethanes	**0.0321**	MAC = 0.1	0.00400	mg/L	N/A	
Volatile Organic Compounds (VOC)						
Bromodichloromethane	**0.0028**	N/A	0.0010	mg/L	2019-01-17	
Bromoform	< 0.0010	N/A	0.0010	mg/L	2019-01-17	
Chloroform	**0.0294**	N/A	0.0010	mg/L	2019-01-17	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	2019-01-17	
Surrogate: Toluene-d8	*86*		*70-130*	%	*2019-01-17*	
Surrogate: 4-Bromofluorobenzene	*82*		*70-130*	%	*2019-01-17*	

Sample Qualifiers:

HT1	The sample was prepared and/or analyzed past the recommended holding time.
HT2	The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
S03	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Stettler, Town of (Alberta)	**WORK ORDER**	9010672
PROJECT	Distribution System - Biannual Analysis	**REPORTED**	2019-01-31 17:10

Analysis Description	Method Ref.	Technique	Location
Acid Herbicides in Water	EPA 8151A*	DCM Extraction with Diazomethane Derivatization, GC-MS	Richmond
Alkalinity in Water	SM 2320 B* (2011)	Titration with H2SO4	Edmonton
Ammonia, Total in Water	SM 4500-NH3 D* (2011)	Ion Selective Electrode	Edmonton
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Edmonton
Bromate in Water	SM 4110 B (2011)	Ion Chromatography	Sublet
Carbon, Total Organic in Water	SM 5310 B (2011)	Combustion, Infrared CO2 Detection	Kelowna
Chlorine, Free in Water	SM 4500-Cl G (2011)	Colorimetry (DPD)	Edmonton
Chlorine, Total in Water	SM 4500-Cl G (2011)	Colorimetry (DPD)	Edmonton
Colour, True in Water	SM 2120 C (2011)	Spectrophotometry (456 nm)	Edmonton
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Edmonton
Cyanide, Free in Water	ASTM D7237-15a	Flow Injection with Gas Diffusion and Amperometry	Kelowna
Cyanobacterial Toxins in Water	EPA 546*	Adda Enzyme-Linked Immunosorbent Assay (ELISA)	Sublet
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Glyphosate in Water	EPA 547*	Direct Aqueous Injection HPLC with Post-Column Derivatization and Fluorescence Detection	Richmond
Hardness in Water	SM 2340 B (2011)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Ion Balance in Water	SM 1030 E (2011)	Calculation: 100 x ([Cations]-[Anions])/([Cations]+[Anions])	N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Nitrilotriacetic Acid in Water	EPA 430.1	Manual Colorimetry (Zinc-Zincon)	Kelowna
Pesticides in Water	EPA 3510C* / EPA 8270D*	Liquid-Liquid DCM Extraction (B/N) / GC-MSD (SIM)	Richmond
pH in Water	SM 4500-H+ B (2011)	Electrometry	Edmonton
Phenols, Chlorinated in Water	EPA 3510C* / EPA 8270D	Liquid-Liquid DCM Extraction (Acidic) / GC-MSD (SIM)	Richmond
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 (2011)	Calculation: 100 x ([Cations]-[Anions])/([Cations]+[Anions])	N/A
Sulfide, Total in Water	SM 4500-S2 D* (2011)	Colorimetry (Methylene Blue)	Edmonton
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Trihalomethanes in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond
Turbidity in Water	SM 2130 B (2011)	Nephelometry	Edmonton
Volatile Organic Compounds in Water	EPA 5030B / EPA 8260D	Purge&Trap / GC-MSD (SIM)	Richmond

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)
%	Percent
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
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
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Health Canada, Feb 2017)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing. The quality control (QC) data is available upon request