CERTIFICATE OF ANALYSIS

REPORTED TO Black Mountain Irrigation District
285 Gray Avenue
KELOWNA, BC V1X 1W8

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ATTENTION	BMID Reports	**WORK ORDER**	5120029
PO NUMBER		**RECEIVED / TEMP**	Dec-01-15 08:40 / 5°C
PROJECT	Comprehensive	**REPORTED**	Dec-08-15
PROJECT INFO		**COC NUMBER**	no#

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition 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.

Authorized By: **Ed Hoppe, B.Sc., P.Chem.**
Division Manager, Kelowna

If you have any questions or concerns, please contact your Account Manager:
Jennifer Shanko, AScT (jshanko@caro.ca)

ANALYSIS INFORMATION

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Analysis Description	Method Reference	Technique	Location
Alkalinity in Water (Total)	APHA 2320 B*	Titration with H2SO4	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Colour, True	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Cyanide, Total in Water	APHA 4500-CN- C / APHA 4500-CN- E	Distillation / Colorimetry	Kelowna
E. coli (CCA)	APHA 9222*	Membrane Filtration / Chromocult Agar	Kelowna
Hardness (as CaCO3)	APHA 2340 B	Calculation: 2.497 [Ca] + 4.118 [Mg]	N/A
Mercury, total by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Solids, Total Dissolved	APHA 1030 E	Calculation: 100 x ([Cations]-[Anions])/ ([Cations]+[Anions])	N/A
Total Coliforms (CCA)	APHA 9222*	Membrane Filtration / Chromocult Agar	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Transmissivity at 254 nm	APHA 5910 B	Ultraviolet Absorption	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

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

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation
EPA	United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
% T	Percent Transmittance
CFU/100 mL	Colony Forming Units per 100 millilitres
CU	Colour Units (referenced against a platinum cobalt standard)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre

SAMPLE ANALYTICAL DATA

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Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Booster #1 (5120029-01) [Water] Sampled: Dec-01-15 08:10						
Anions						
Chloride	**6.02**	0.10	mg/L	N/A	Dec-03-15	
Fluoride	< 0.10	0.10	mg/L	N/A	Dec-03-15	
Nitrate as N	**0.017**	0.010	mg/L	N/A	Dec-03-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Dec-03-15	
Sulfate	**6.6**	1.0	mg/L	N/A	Dec-03-15	
General Parameters						
Alkalinity, Total as CaCO3	**49**	1	mg/L	N/A	Dec-05-15	
Colour, True	< 5	5	CU	N/A	Dec-02-15	
Conductivity (EC)	**132**	2	µS/cm	N/A	Dec-05-15	
Cyanide, Total	< 0.010	0.010	mg/L	Dec-07-15	Dec-07-15	
pH	**7.68**	0.01	pH units	N/A	Dec-05-15	HT2
Turbidity	**0.4**	0.1	NTU	N/A	Dec-01-15	
UV Transmittance @ 254nm	**85.1**	0.1	% T	N/A	Dec-01-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**55.2**	5.0	mg/L	N/A	N/A	
Solids, Total Dissolved	**66.6**	2.0	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	**0.05**	0.05	mg/L	Dec-03-15	Dec-04-15	
Antimony, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Arsenic, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	
Barium, total	< 0.05	0.05	mg/L	Dec-03-15	Dec-04-15	
Beryllium, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Boron, total	< 0.04	0.04	mg/L	Dec-03-15	Dec-04-15	
Cadmium, total	< 0.0001	0.0001	mg/L	Dec-03-15	Dec-04-15	
Calcium, total	**15.6**	2.0	mg/L	Dec-03-15	Dec-04-15	
Chromium, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	
Cobalt, total	< 0.0005	0.0005	mg/L	Dec-03-15	Dec-04-15	
Copper, total	< 0.002	0.002	mg/L	Dec-03-15	Dec-04-15	
Iron, total	< 0.10	0.10	mg/L	Dec-03-15	Dec-04-15	
Lead, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Magnesium, total	**4.0**	0.1	mg/L	Dec-03-15	Dec-04-15	
Manganese, total	**0.006**	0.002	mg/L	Dec-03-15	Dec-04-15	
Mercury, total	< 0.00002	0.00002	mg/L	Dec-06-15	Dec-07-15	
Molybdenum, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Nickel, total	< 0.002	0.002	mg/L	Dec-03-15	Dec-04-15	
Phosphorus, total	< 0.2	0.2	mg/L	Dec-03-15	Dec-04-15	
Potassium, total	**0.3**	0.2	mg/L	Dec-03-15	Dec-04-15	
Selenium, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	
Silicon, total	< 5	5	mg/L	Dec-03-15	Dec-04-15	
Silver, total	< 0.0005	0.0005	mg/L	Dec-03-15	Dec-04-15	
Sodium, total	**3.9**	0.2	mg/L	Dec-03-15	Dec-04-15	
Uranium, total	**0.0002**	0.0002	mg/L	Dec-03-15	Dec-04-15	
Vanadium, total	< 0.01	0.01	mg/L	Dec-03-15	Dec-04-15	
Zinc, total	< 0.04	0.04	mg/L	Dec-03-15	Dec-04-15	

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Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Booster #1 (5120029-01) [Water] Sampled: Dec-01-15 08:10, Continued						
Microbiological Parameters						
Coliforms, Total	< 1	1	CFU/100 mL	Dec-01-15	Dec-02-15	
E. coli	< 1	1	CFU/100 mL	Dec-01-15	Dec-02-15	
Sample ID: Well 4 (5120029-02) [Water] Sampled: Dec-01-15 08:28						
Anions						
Chloride	**11.5**	0.10	mg/L	N/A	Dec-03-15	
Fluoride	< 0.10	0.10	mg/L	N/A	Dec-03-15	
Nitrate as N	**3.79**	0.010	mg/L	N/A	Dec-03-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Dec-03-15	
Sulfate	**24.3**	1.0	mg/L	N/A	Dec-03-15	
General Parameters						
Alkalinity, Total as CaCO3	**214**	1	mg/L	N/A	Dec-05-15	
Colour, True	< 5	5	CU	N/A	Dec-02-15	
Conductivity (EC)	**496**	2	µS/cm	N/A	Dec-05-15	
Cyanide, Total	< 0.010	0.010	mg/L	Dec-07-15	Dec-07-15	
pH	**8.13**	0.01	pH units	N/A	Dec-05-15	HT2
Turbidity	< 0.1	0.1	NTU	N/A	Dec-01-15	
UV Transmittance @ 254nm	**97.4**	0.1	% T	N/A	Dec-01-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**242**	5.0	mg/L	N/A	N/A	
Solids, Total Dissolved	**283**	2.0	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	Dec-03-15	Dec-04-15	
Antimony, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Arsenic, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	
Barium, total	< 0.05	0.05	mg/L	Dec-03-15	Dec-04-15	
Beryllium, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Boron, total	< 0.04	0.04	mg/L	Dec-03-15	Dec-04-15	
Cadmium, total	< 0.0001	0.0001	mg/L	Dec-03-15	Dec-04-15	
Calcium, total	**73.0**	2.0	mg/L	Dec-03-15	Dec-04-15	
Chromium, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	
Cobalt, total	< 0.0005	0.0005	mg/L	Dec-03-15	Dec-04-15	
Copper, total	< 0.002	0.002	mg/L	Dec-03-15	Dec-04-15	
Iron, total	< 0.10	0.10	mg/L	Dec-03-15	Dec-04-15	
Lead, total	< 0.001	0.001	mg/L	Dec-03-15	Dec-04-15	
Magnesium, total	**14.6**	0.1	mg/L	Dec-03-15	Dec-04-15	
Manganese, total	< 0.002	0.002	mg/L	Dec-03-15	Dec-04-15	
Mercury, total	< 0.00002	0.00002	mg/L	Dec-06-15	Dec-07-15	
Molybdenum, total	**0.001**	0.001	mg/L	Dec-03-15	Dec-04-15	
Nickel, total	< 0.002	0.002	mg/L	Dec-03-15	Dec-04-15	
Phosphorus, total	**0.3**	0.2	mg/L	Dec-03-15	Dec-04-15	
Potassium, total	**1.3**	0.2	mg/L	Dec-03-15	Dec-04-15	
Selenium, total	< 0.005	0.005	mg/L	Dec-03-15	Dec-04-15	

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Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Well 4 (5120029-02) [Water] Sampled: Dec-01-15 08:28, Continued						
Total Recoverable Metals, Continued						
Silicon, total	**9**	5	mg/L	Dec-03-15	Dec-04-15	
Silver, total	< 0.0005	0.0005	mg/L	Dec-03-15	Dec-04-15	
Sodium, total	**10.4**	0.2	mg/L	Dec-03-15	Dec-04-15	
Uranium, total	**0.0009**	0.0002	mg/L	Dec-03-15	Dec-04-15	
Vanadium, total	< 0.01	0.01	mg/L	Dec-03-15	Dec-04-15	
Zinc, total	< 0.04	0.04	mg/L	Dec-03-15	Dec-04-15	
Microbiological Parameters						
Coliforms, Total	< 1	1	CFU/100 mL	Dec-01-15	Dec-02-15	
E. coli	< 1	1	CFU/100 mL	Dec-01-15	Dec-02-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.