



CERTIFICATE OF ANALYSIS

REPORTED TO Keremeos Irrigation District
Box 220
Keremeos, BC V0X 1N0

ATTENTION Jo Cottrill

PO NUMBER
PROJECT General Potability
PROJECT INFO

WORK ORDER 20J1550

RECEIVED / TEMP 2020-10-16 11:15 / 8°C
REPORTED 2020-10-26 15:30
COC NUMBER No Number

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/IEC 17025:2017 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.

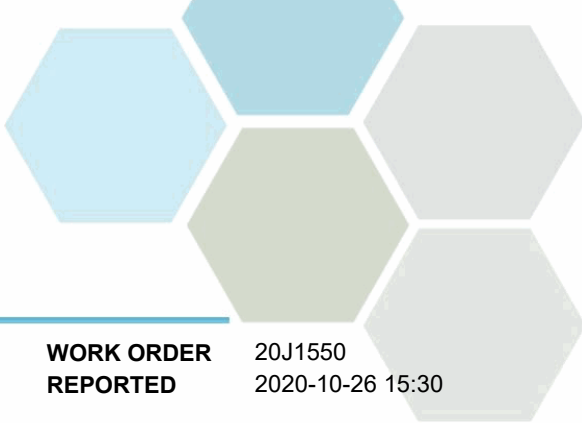
If you have any questions or concerns, please contact me at teamcaro@caro.ca

Authorized By:

Team CARO
Client Service Representative

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TEST RESULTS

REPORTED TO PROJECT Keremeos Irrigation District
General Potability

WORK ORDER REPORTED 20J1550
2020-10-26 15:30

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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East Pump #6 (20J1550-01) | Matrix: Water | Sampled: 2020-10-15 10:50

Anions

Chloride	22.6	AO ≤ 250	0.10 mg/L	2020-10-17	
Fluoride	0.10	MAC = 1.5	0.10 mg/L	2020-10-17	
Nitrate (as N)	0.551	MAC = 10	0.010 mg/L	2020-10-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-10-17	
Sulfate	79.9	AO ≤ 500	1.0 mg/L	2020-10-17	

Calculated Parameters

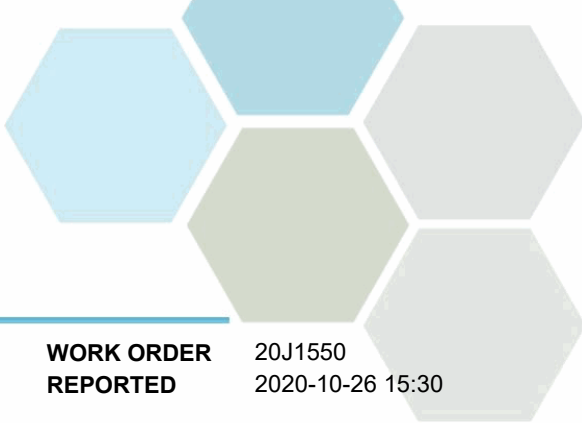
Hardness, Total (as CaCO3)	265	None Required	0.500 mg/L	N/A	
Langelier Index	0.8	N/A	-5.0	2020-10-23	
Solids, Total Dissolved	360	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	231	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Bicarbonate (as CaCO3)	231	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2020-10-17	
Conductivity (EC)	552	N/A	2.0 µS/cm	2020-10-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-10-19	
pH	8.03	7.0-10.5	0.10 pH units	2020-10-21	HT2
Temperature, at pH	20.8	N/A	°C	2020-10-21	HT2
Turbidity	0.26	OG < 1	0.10 NTU	2020-10-17	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-10-26	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-10-26	
Arsenic, total	0.00400	MAC = 0.01	0.00050 mg/L	2020-10-26	
Barium, total	0.0332	MAC = 2	0.0050 mg/L	2020-10-26	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2020-10-26	
Cadmium, total	0.000011	MAC = 0.005	0.000010 mg/L	2020-10-26	
Calcium, total	82.7	None Required	0.20 mg/L	2020-10-26	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-26	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2020-10-26	
Copper, total	0.00286	MAC = 2	0.00040 mg/L	2020-10-26	
Iron, total	0.045	AO ≤ 0.3	0.010 mg/L	2020-10-26	
Lead, total	0.00029	MAC = 0.005	0.00020 mg/L	2020-10-26	
Magnesium, total	14.1	None Required	0.010 mg/L	2020-10-26	
Manganese, total	0.00151	MAC = 0.12	0.00020 mg/L	2020-10-26	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2020-10-21	
Molybdenum, total	0.00449	N/A	0.00010 mg/L	2020-10-26	
Nickel, total	0.00251	N/A	0.00040 mg/L	2020-10-26	
Potassium, total	3.28	N/A	0.10 mg/L	2020-10-26	
Selenium, total	0.00096	MAC = 0.05	0.00050 mg/L	2020-10-26	



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East Pump #6 (20J1550-01) | Matrix: Water | Sampled: 2020-10-15 10:50, Continued

Total Metals, Continued

Sodium, total	14.4	AO ≤ 200	0.10 mg/L	2020-10-26	
Strontium, total	0.615	7	0.0010 mg/L	2020-10-26	
Uranium, total	0.00202	MAC = 0.02	0.000020 mg/L	2020-10-26	
Zinc, total	0.0057	AO ≤ 5	0.0040 mg/L	2020-10-26	

West Pump #3 (20J1550-02) | Matrix: Water | Sampled: 2020-10-15 11:20

Anions

Chloride	3.60	AO ≤ 250	0.10 mg/L	2020-10-17	
Fluoride	< 0.10	MAC = 1.5	0.10 mg/L	2020-10-17	
Nitrate (as N)	0.714	MAC = 10	0.010 mg/L	2020-10-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2020-10-17	
Sulfate	23.7	AO ≤ 500	1.0 mg/L	2020-10-17	

Calculated Parameters

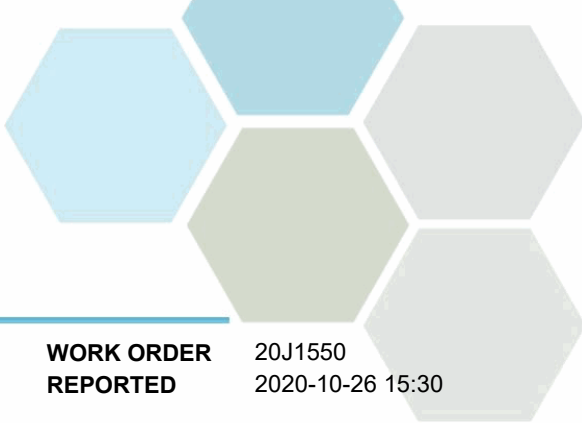
Hardness, Total (as CaCO3)	129	None Required	0.500 mg/L	N/A	
Langelier Index	0.2	N/A	-5.0	2020-10-23	
Solids, Total Dissolved	168	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	136	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Bicarbonate (as CaCO3)	136	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2020-10-21	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2020-10-17	
Conductivity (EC)	250	N/A	2.0 µS/cm	2020-10-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2020-10-19	
pH	7.89	7.0-10.5	0.10 pH units	2020-10-21	HT2
Temperature, at pH	20.9	N/A	°C	2020-10-21	HT2
Turbidity	0.10	OG < 1	0.10 NTU	2020-10-17	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050 mg/L	2020-10-26	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2020-10-26	
Arsenic, total	0.00164	MAC = 0.01	0.00050 mg/L	2020-10-26	
Barium, total	0.0377	MAC = 2	0.0050 mg/L	2020-10-26	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2020-10-26	
Cadmium, total	0.000010	MAC = 0.005	0.000010 mg/L	2020-10-26	
Calcium, total	42.3	None Required	0.20 mg/L	2020-10-26	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-26	
Cobalt, total	0.00011	N/A	0.00010 mg/L	2020-10-26	
Copper, total	0.00094	MAC = 2	0.00040 mg/L	2020-10-26	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2020-10-26	



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West Pump #3 (20J1550-02) Matrix: Water Sampled: 2020-10-15 11:20, Continued						
<i>Total Metals, Continued</i>						
Lead, total	< 0.00020	MAC = 0.005	0.00020	mg/L	2020-10-26	
Magnesium, total	5.74	None Required	0.010	mg/L	2020-10-26	
Manganese, total	< 0.00020	MAC = 0.12	0.00020	mg/L	2020-10-26	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2020-10-21	
Molybdenum, total	0.00197	N/A	0.00010	mg/L	2020-10-26	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2020-10-26	
Potassium, total	1.44	N/A	0.10	mg/L	2020-10-26	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2020-10-26	
Sodium, total	4.80	AO ≤ 200	0.10	mg/L	2020-10-26	
Strontium, total	0.230	7	0.0010	mg/L	2020-10-26	
Uranium, total	0.000631	MAC = 0.02	0.000020	mg/L	2020-10-26	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2020-10-26	

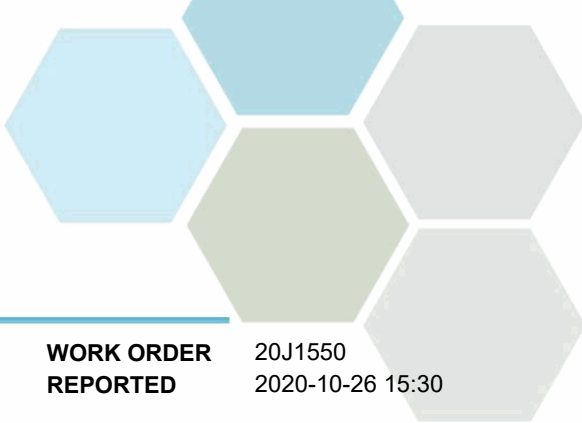
Red Bridge 10hp (20J1550-03) | Matrix: Water | Sampled: 2020-10-15 11:36

<i>Anions</i>						
Chloride	3.36	AO ≤ 250	0.10	mg/L	2020-10-17	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2020-10-17	
Nitrate (as N)	0.174	MAC = 10	0.010	mg/L	2020-10-17	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2020-10-17	
Sulfate	16.3	AO ≤ 500	1.0	mg/L	2020-10-17	

<i>Calculated Parameters</i>						
Hardness, Total (as CaCO3)	99.2	None Required	0.500	mg/L	N/A	
Langelier Index	0.04	N/A	-5.0		2020-10-23	
Solids, Total Dissolved	137	AO ≤ 500	1.00	mg/L	N/A	

<i>General Parameters</i>						
Alkalinity, Total (as CaCO3)	123	N/A	1.0	mg/L	2020-10-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-10-21	
Alkalinity, Bicarbonate (as CaCO3)	123	N/A	1.0	mg/L	2020-10-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-10-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2020-10-21	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2020-10-17	
Conductivity (EC)	185	N/A	2.0	µS/cm	2020-10-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2020-10-19	
pH	7.90	7.0-10.5	0.10	pH units	2020-10-21	HT2
Temperature, at pH	21.1	N/A		°C	2020-10-21	HT2
Turbidity	2.26	OG < 1	0.10	NTU	2020-10-17	

<i>Total Metals</i>						
Aluminum, total	0.0143	OG < 0.1	0.0050	mg/L	2020-10-26	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2020-10-26	
Arsenic, total	0.00083	MAC = 0.01	0.00050	mg/L	2020-10-26	



TEST RESULTS

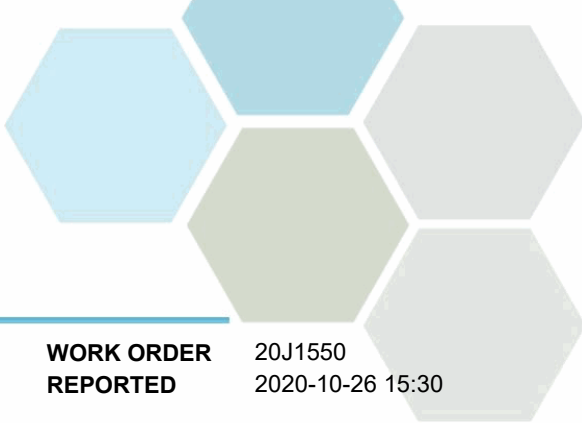
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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
Red Bridge 10hp (20J1550-03) Matrix: Water Sampled: 2020-10-15 11:36, Continued					
<i>Total Metals, Continued</i>					
Barium, total	0.0322	MAC = 2	0.0050 mg/L	2020-10-26	
Boron, total	< 0.0500	MAC = 5	0.0500 mg/L	2020-10-26	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2020-10-26	
Calcium, total	32.7	None Required	0.20 mg/L	2020-10-26	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-26	
Cobalt, total	0.00015	N/A	0.00010 mg/L	2020-10-26	
Copper, total	0.00817	MAC = 2	0.00040 mg/L	2020-10-26	
Iron, total	0.489	AO ≤ 0.3	0.010 mg/L	2020-10-26	
Lead, total	0.00171	MAC = 0.005	0.00020 mg/L	2020-10-26	
Magnesium, total	4.24	None Required	0.010 mg/L	2020-10-26	
Manganese, total	0.00281	MAC = 0.12	0.00020 mg/L	2020-10-26	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2020-10-21	
Molybdenum, total	0.00152	N/A	0.00010 mg/L	2020-10-26	
Nickel, total	0.00105	N/A	0.00040 mg/L	2020-10-26	
Potassium, total	1.02	N/A	0.10 mg/L	2020-10-26	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2020-10-26	
Sodium, total	3.99	AO ≤ 200	0.10 mg/L	2020-10-26	
Strontium, total	0.174	7	0.0010 mg/L	2020-10-26	
Uranium, total	0.000533	MAC = 0.02	0.000020 mg/L	2020-10-26	
Zinc, total	0.129	AO ≤ 5	0.0040 mg/L	2020-10-26	

Sample Qualifiers:

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



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Keremeos Irrigation District
General Potability

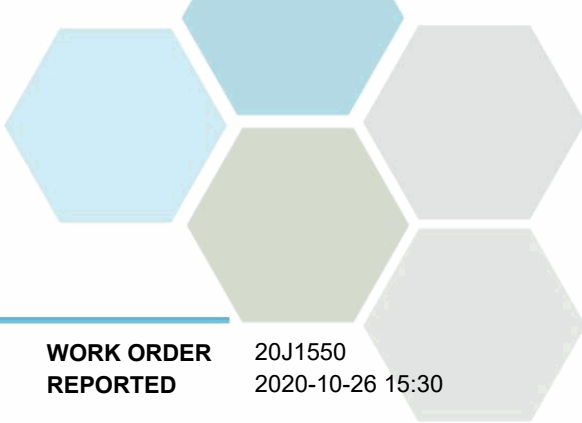
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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Colour, True in Water	SM 2120 C (2017)	Spectrophotometry (456 nm)	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	✓	Kelowna
Hardness in Water	SM 2340 B* (2017)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Langelier Index in Water	SM 2330 B (2017)	Calculation		N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)		N/A
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Turbidity in Water	SM 2130 B (2017)	Nephelometry	✓	Kelowna

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

Glossary of Terms:

RL	Reporting Limit (default)
<	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
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
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



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General Comments:

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Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: teamcaro@caro.ca

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