



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 9051260

RECEIVED / TEMP 2019-05-14 09:25 / 13°C

REPORTED 2019-05-22 16:32

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



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.

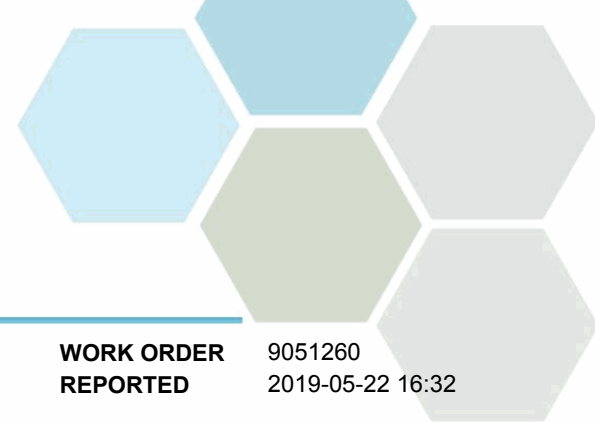
If you have any questions or concerns, please contact me at teamcaro@caro.ca

Authorized By:

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TEST RESULTS

REPORTED TO PROJECT Keremeos Irrigation District
General Potability

WORK ORDER REPORTED 9051260
2019-05-22 16:32

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
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30hp Red Bridge (9051260-01) | Matrix: Water | Sampled: 2019-05-13 11:15

Anions

Chloride	5.27	AO ≤ 250	0.10 mg/L	2019-05-15	
Fluoride	< 0.10	MAC = 1.5	0.10 mg/L	2019-05-15	
Nitrate (as N)	0.196	MAC = 10	0.010 mg/L	2019-05-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2019-05-15	
Sulfate	18.9	AO ≤ 500	1.0 mg/L	2019-05-15	

Calculated Parameters

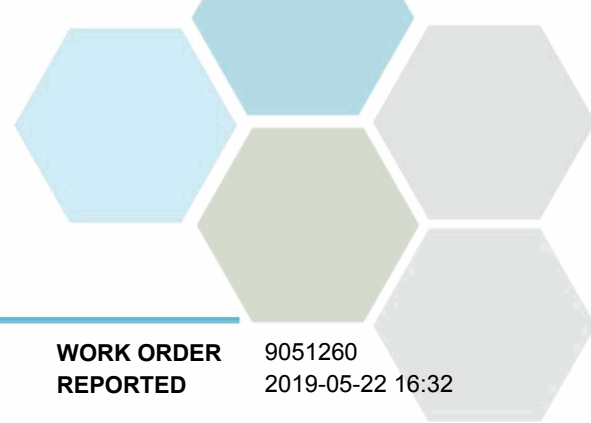
Hardness, Total (as CaCO3)	91.4	None Required	0.500 mg/L	N/A	
Langelier Index	-0.1	N/A	-5.0	2019-05-22	
Solids, Total Dissolved	118	AO ≤ 500	1.00 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	88.7	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Bicarbonate (as CaCO3)	88.7	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2019-05-17	HT1
Conductivity (EC)	204	N/A	2.0 µS/cm	2019-05-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2019-05-15	
pH	7.94	7.0-10.5	0.10 pH units	2019-05-21	HT2
Temperature, at pH	22.1	N/A	°C	2019-05-21	HT2
Turbidity	< 0.10	OG < 1	0.10 NTU	2019-05-15	

Total Metals

Aluminum, total	0.0111	OG < 0.1	0.0050 mg/L	2019-05-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2019-05-17	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050 mg/L	2019-05-17	
Barium, total	0.0288	MAC = 1	0.0050 mg/L	2019-05-17	
Boron, total	0.0102	MAC = 5	0.0050 mg/L	2019-05-17	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010 mg/L	2019-05-17	
Calcium, total	28.7	None Required	0.20 mg/L	2019-05-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2019-05-17	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2019-05-17	
Copper, total	0.00237	AO ≤ 1	0.00040 mg/L	2019-05-17	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2019-05-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2019-05-17	
Magnesium, total	4.75	None Required	0.010 mg/L	2019-05-17	
Manganese, total	< 0.00020	MAC = 0.12	0.00020 mg/L	2019-05-17	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2019-05-21	
Molybdenum, total	0.00135	N/A	0.00010 mg/L	2019-05-17	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2019-05-17	
Potassium, total	0.89	N/A	0.10 mg/L	2019-05-17	



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Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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30hp Red Bridge (9051260-01) | Matrix: Water | Sampled: 2019-05-13 11:15, Continued

Total Metals, Continued

Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2019-05-17	
Sodium, total	4.50	AO ≤ 200	0.10	mg/L	2019-05-17	
Strontium, total	0.154	N/A	0.0010	mg/L	2019-05-17	
Uranium, total	0.000497	MAC = 0.02	0.000020	mg/L	2019-05-17	
Zinc, total	0.0084	AO ≤ 5	0.0040	mg/L	2019-05-17	

West Pump #1 (9051260-02) | Matrix: Water | Sampled: 2019-05-13 11:45

Anions

Chloride	3.75	AO ≤ 250	0.10	mg/L	2019-05-15	
Fluoride	0.12	MAC = 1.5	0.10	mg/L	2019-05-15	
Nitrate (as N)	0.656	MAC = 10	0.010	mg/L	2019-05-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2019-05-15	
Sulfate	23.8	AO ≤ 500	1.0	mg/L	2019-05-15	

Calculated Parameters

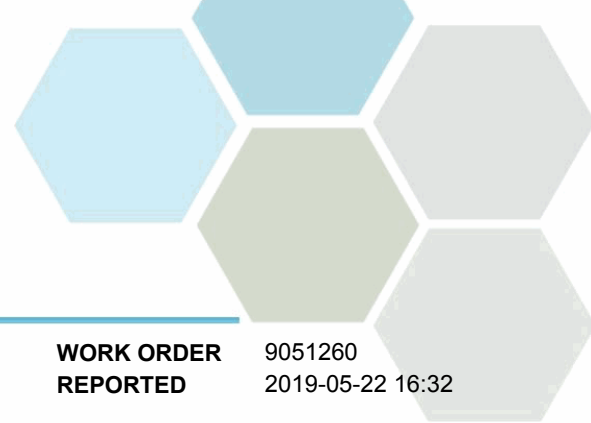
Hardness, Total (as CaCO3)	111	None Required	0.500	mg/L	N/A	
Langelier Index	0.1	N/A	-5.0		2019-05-22	
Solids, Total Dissolved	143	AO ≤ 500	1.00	mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO3)	107	N/A	1.0	mg/L	2019-05-21	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	2019-05-21	
Alkalinity, Bicarbonate (as CaCO3)	107	N/A	1.0	mg/L	2019-05-21	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	2019-05-21	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	2019-05-21	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2019-05-17	HT1
Conductivity (EC)	244	N/A	2.0	µS/cm	2019-05-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	2019-05-15	
pH	8.00	7.0-10.5	0.10	pH units	2019-05-21	HT2
Temperature, at pH	22.5	N/A		°C	2019-05-21	HT2
Turbidity	< 0.10	OG < 1	0.10	NTU	2019-05-15	

Total Metals

Aluminum, total	0.0084	OG < 0.1	0.0050	mg/L	2019-05-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2019-05-17	
Arsenic, total	0.00130	MAC = 0.01	0.00050	mg/L	2019-05-17	
Barium, total	0.0316	MAC = 1	0.0050	mg/L	2019-05-17	
Boron, total	0.0189	MAC = 5	0.0050	mg/L	2019-05-17	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2019-05-17	
Calcium, total	34.7	None Required	0.20	mg/L	2019-05-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2019-05-17	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2019-05-17	



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Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
West Pump #1 (9051260-02) Matrix: Water Sampled: 2019-05-13 11:45, Continued					
<i>Total Metals, Continued</i>					
Copper, total	0.00219	AO ≤ 1	0.00040 mg/L	2019-05-17	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2019-05-17	
Lead, total	< 0.00020	MAC = 0.005	0.00020 mg/L	2019-05-17	
Magnesium, total	5.92	None Required	0.010 mg/L	2019-05-17	
Manganese, total	< 0.00020	MAC = 0.12	0.00020 mg/L	2019-05-17	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2019-05-21	
Molybdenum, total	0.00177	N/A	0.00010 mg/L	2019-05-17	
Nickel, total	< 0.00040	N/A	0.00040 mg/L	2019-05-17	
Potassium, total	1.19	N/A	0.10 mg/L	2019-05-17	
Selenium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2019-05-17	
Sodium, total	4.99	AO ≤ 200	0.10 mg/L	2019-05-17	
Strontium, total	0.192	N/A	0.0010 mg/L	2019-05-17	
Uranium, total	0.000649	MAC = 0.02	0.000020 mg/L	2019-05-17	
Zinc, total	0.0070	AO ≤ 5	0.0040 mg/L	2019-05-17	

East Pump #5 (9051260-03) | Matrix: Water | Sampled: 2019-05-13 12:15

Anions

Chloride	8.93	AO ≤ 250	0.10 mg/L	2019-05-15	
Fluoride	0.16	MAC = 1.5	0.10 mg/L	2019-05-15	
Nitrate (as N)	1.96	MAC = 10	0.010 mg/L	2019-05-15	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2019-05-15	
Sulfate	105	AO ≤ 500	1.0 mg/L	2019-05-21	

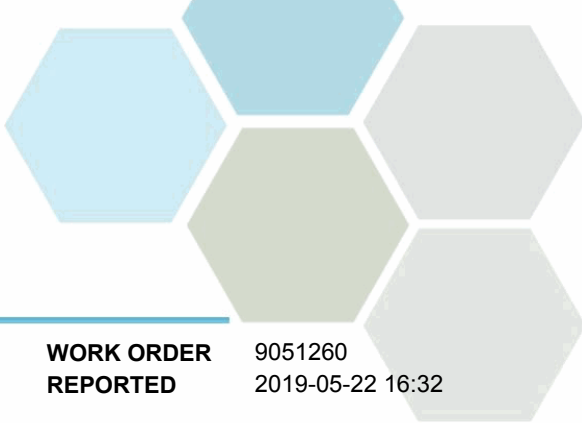
Calculated Parameters

Hardness, Total (as CaCO ₃)	276	None Required	0.500 mg/L	N/A	
Langelier Index	1.0	N/A	-5.0	2019-05-22	
Solids, Total Dissolved	374	AO ≤ 500	10.0 mg/L	N/A	

General Parameters

Alkalinity, Total (as CaCO ₃)	221	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Bicarbonate (as CaCO ₃)	221	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	1.0 mg/L	2019-05-21	
Colour, True	< 5.0	AO ≤ 15	5.0 CU	2019-05-17	HT1
Conductivity (EC)	594	N/A	2.0 µS/cm	2019-05-21	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020 mg/L	2019-05-15	
pH	8.11	7.0-10.5	0.10 pH units	2019-05-21	HT2
Temperature, at pH	22.9	N/A	°C	2019-05-21	HT2
Turbidity	< 0.10	OG < 1	0.10 NTU	2019-05-15	

Total Metals



TEST RESULTS

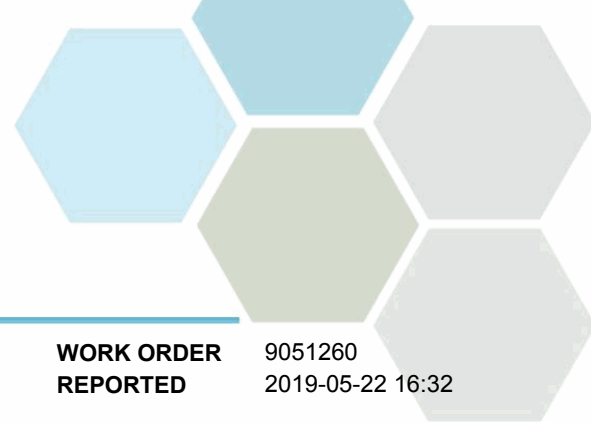
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General Potability

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2019-05-22 16:32

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
East Pump #5 (9051260-03) Matrix: Water Sampled: 2019-05-13 12:15, Continued					
<i>Total Metals, Continued</i>					
Aluminum, total	0.0241	OG < 0.1	0.0050 mg/L	2019-05-17	
Antimony, total	< 0.00020	MAC = 0.006	0.00020 mg/L	2019-05-17	
Arsenic, total	0.00172	MAC = 0.01	0.00050 mg/L	2019-05-17	
Barium, total	0.0339	MAC = 1	0.0050 mg/L	2019-05-17	
Boron, total	0.0262	MAC = 5	0.0050 mg/L	2019-05-17	
Cadmium, total	0.000021	MAC = 0.005	0.000010 mg/L	2019-05-17	
Calcium, total	85.7	None Required	0.20 mg/L	2019-05-17	
Chromium, total	< 0.00050	MAC = 0.05	0.00050 mg/L	2019-05-17	
Cobalt, total	< 0.00010	N/A	0.00010 mg/L	2019-05-17	
Copper, total	0.00250	AO ≤ 1	0.00040 mg/L	2019-05-17	
Iron, total	< 0.010	AO ≤ 0.3	0.010 mg/L	2019-05-17	
Lead, total	0.00023	MAC = 0.005	0.00020 mg/L	2019-05-17	
Magnesium, total	15.1	None Required	0.010 mg/L	2019-05-17	
Manganese, total	0.00032	MAC = 0.12	0.00020 mg/L	2019-05-17	
Mercury, total	< 0.000010	MAC = 0.001	0.000010 mg/L	2019-05-21	
Molybdenum, total	0.00259	N/A	0.00010 mg/L	2019-05-17	
Nickel, total	0.00045	N/A	0.00040 mg/L	2019-05-17	
Potassium, total	2.55	N/A	0.10 mg/L	2019-05-17	
Selenium, total	0.00166	MAC = 0.05	0.00050 mg/L	2019-05-17	
Sodium, total	12.9	AO ≤ 200	0.10 mg/L	2019-05-17	
Strontium, total	0.531	N/A	0.0010 mg/L	2019-05-17	
Uranium, total	0.00521	MAC = 0.02	0.000020 mg/L	2019-05-17	
Zinc, total	0.0072	AO ≤ 5	0.0040 mg/L	2019-05-17	

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.



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Keremeos Irrigation District
General Potability

WORK ORDER REPORTED 9051260
2019-05-22 16:32

Analysis Description	Method Ref.	Technique	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

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

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