



Manitoba Water Services Board - CRWC
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Date Received: 09-AUG-16
Report Date: 19-AUG-16 07:03 (MT)
Version: FINAL

Client Phone: 204-353-4055

Certificate of Analysis

Lab Work Order #: L1810748
Project P.O. #: 28128
Job Reference: CARTIER REGIONAL - PWS 36.00
C of C Numbers:
Legal Site Desc: 28128

Hua Wo
Chemistry Laboratory Manager

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ANALYTICAL REPORT

Physical Tests (WATER)

		ALS ID		L1810748-1	L1810748-2
		Sampled Date		09-AUG-16	09-AUG-16
		Sampled Time		09:00	09:00
		Sample ID			
Analyte	Unit	Guide Limit #1	Guide Limit #2	CARTIER REGIONAL 1 - RAW	CARTIER REGIONAL 2 TREATED
Colour, True	CU	15	-	<5.0	25.0
Conductivity	umhos/cm	-	-	1010	361
Hardness (as CaCO3)	mg/L	-	-	447	98.6
Langelier Index (4 C)	No Unit	-	-	1.1	-0.50
Langelier Index (60 C)	No Unit	-	-	1.9	0.27
pH	pH units	6.5-8.5	-	8.52	7.90
Total Dissolved Solids	mg/L	500	-	681	225
Transmittance, UV (254 nm)	%T/cm	-	-	46.0	86.7
Turbidity	NTU	-	-	10.8	0.42

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (Pre-2003)

Anions and Nutrients (WATER)

		ALS ID		L1810748-1	L1810748-2
		Sampled Date		09-AUG-16	09-AUG-16
		Sampled Time		09:00	09:00
		Sample ID			
Analyte	Unit	Guide Limit #1	Guide Limit #2	CARTIER REGIONAL 1 - RAW	CARTIER REGIONAL 2 TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	268	87.4
Ammonia, Total (as N)	mg/L	-	-	0.198	<0.010
Bicarbonate (HCO3)	mg/L	-	-	306	107
Bromide (Br)	mg/L	-	-	0.10	<0.10
Carbonate (CO3)	mg/L	-	-	10.2	<0.60
Chloride (Cl)	mg/L	250	-	26.2	13.4
Fluoride (F)	mg/L	-	1.5	0.178	0.564
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.0456	0.0384
Nitrite (as N)	mg/L	-	1	0.0154	<0.0010
Sulfate (SO4)	mg/L	500	-	254	70.0

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (Pre-2003)

Organic / Inorganic Carbon (WATER)

		ALS ID		L1810748-1	L1810748-2
		Sampled Date		09-AUG-16	09-AUG-16
		Sampled Time		09:00	09:00
		Sample ID			
Analyte	Unit	Guide Limit #1	Guide Limit #2	CARTIER REGIONAL 1 - RAW	CARTIER REGIONAL 2 TREATED
Dissolved Organic Carbon	mg/L	-	-	12.7	2.74
Total Organic Carbon	mg/L	-	-	12.1	2.60

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

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Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.

Analytical result for this parameter exceeds Guide Limit listed on this report.

ANALYTICAL REPORT

Total Metals (WATER)

Analyte	Unit	ALS ID		L1810748-1	L1810748-2
		Guide Limit #1	Guide Limit #2	09-AUG-16 09:00 CARTIER REGIONAL 1 - RAW	09-AUG-16 09:00 CARTIER REGIONAL 2 TREATED
Aluminum (Al)-Total	mg/L	0.1	-	0.616	0.0134
Antimony (Sb)-Total	mg/L	-	0.006	0.00061	<0.00020
Arsenic (As)-Total	mg/L	-	0.01	0.0129	0.00251
Barium (Ba)-Total	mg/L	-	1	0.0683	0.0153
Beryllium (Be)-Total	mg/L	-	-	<0.00020	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	<0.00020	<0.00020
Boron (B)-Total	mg/L	-	-	0.133	0.120
Cadmium (Cd)-Total	mg/L	-	0.005	0.000019	<0.000010
Calcium (Ca)-Total	mg/L	-	-	88.8	19.9
Cesium (Cs)-Total	mg/L	-	-	<0.00010	<0.00010
Chromium (Cr)-Total	mg/L	-	0.05	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	-	-	0.00053	<0.00020
Copper (Cu)-Total	mg/L	1	-	0.00638	0.118
Iron (Fe)-Total	mg/L	0.3	-	0.587	<0.010
Lead (Pb)-Total	mg/L	-	0.01	0.000313	<0.000090
Lithium (Li)-Total	mg/L	-	-	0.0769	0.0259
Magnesium (Mg)-Total	mg/L	-	-	54.7	11.9
Manganese (Mn)-Total	mg/L	0.05	-	0.785	0.0943
Molybdenum (Mo)-Total	mg/L	-	-	0.00350	0.00087
Nickel (Ni)-Total	mg/L	-	-	0.0043	<0.0020
Phosphorus (P)-Total	mg/L	-	-	0.24	0.47
Potassium (K)-Total	mg/L	-	-	13.0	3.88
Rubidium (Rb)-Total	mg/L	-	-	0.00348	0.00077
Selenium (Se)-Total	mg/L	-	0.05	<0.0010	<0.0010
Silicon (Si)-Total	mg/L	-	-	11.7	3.64
Silver (Ag)-Total	mg/L	-	-	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	200	-	67.2	38.7
Strontium (Sr)-Total	mg/L	-	-	0.363	0.0812
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.00010	<0.00010
Thorium (Th)-Total	mg/L	-	-	0.00016	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00020	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0202	<0.00050

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

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 Analytical result for this parameter exceeds Guide Limit listed on this report.

Total Metals (WATER)

		ALS ID		L1810748-1	L1810748-2
		Sampled Date		09-AUG-16	09-AUG-16
		Sampled Time		09:00	09:00
		Sample ID		CARTIER	CARTIER
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 TREATED
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00400	0.00082
Vanadium (V)-Total	mg/L	-	-	0.00622	0.00097
Zinc (Zn)-Total	mg/L	5	-	0.0033	0.0032
Zirconium (Zr)-Total	mg/L	-	-	0.00090	<0.00040

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

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Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limit listed on this report.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO ₃ 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO ₃ -/L.			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO ₃ ⁻ and H ₂ CO ₃ endpoints indicated electrometrically.			
BR-IC-N-WP	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C
True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E
MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL
This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH ₃ F
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2-L-IC-N-WP	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-WP	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E
A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			
UV-%TRANS-WP	Water	UV Transmittance (Calculated)	APHA 5910B
Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um filter and its UV Absorbance is measured in a quartz cell at 254 nm. UV Transmittance is calculated from the UV Absorbance result and reported as UV Transmittance per cm. The analysis is carried out without pH adjustment.			

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

Manitoba Conservation Water Stewardship
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4



L1810748-COFC

L1810748

ONLY FOR

General Chemistry & VOC Samples

Report to Operator (email pdf):				Owner billing (Email):				Regular Service (default):		Regular Service (is 5-7 Days):	
Contact:	Grant McGorman, Lead Operator - CRWC			Contact:	Kim Davey - MWSB			Unless otherwise requested:		<input type="checkbox"/> 1 Day, rush / priority <input type="checkbox"/> 2 Day, rush / priority <input type="checkbox"/> 3 Day, rush / priority	
Address:	Box 217 St. Eustache MB R0H 1H0			Address:	Unit #1A - 2010 Currie Blvd. Brandon MB R7B 4E7						
Phone:	204-353-4055			Phone:	204-729-6094						
Email:	gmcgorman@crwc.ca; cartierwtp@crwc.ca; dvaillant@crw			Email:	kim.davey@gov.mb.ca						
Operator contact update (if different then above):				Owner contact update (if different then above):				Email pdf copy to:			
Contact:	same as for thm samples - as above			Contact:	as above			DWO:	John Cronk		
Address:				Address:				DWO Address:	309 - 25 Tupper St. N. Portage la Prairie MB R1N 3K1		
Phone:				Phone:				DWO Phone:	204-239-3186		
Email:				Email:				DWO Email:	john.cronk@gov.mb.ca		
Account:		ODW Report type:	EMS (Lab-MWS)	Client / Project Information:				Analysis Request			
Agency Code:	382	Project:	DWQ-C	Operation Name:	CARTIER REGIONAL - PWS			MB-CH-PWS-V2013 Number of Containers			
Lab:	ALS	Lab Work Order # / Job # (lab use only)		Operation Code (com code):	36.00						
				Operation id:	28128						
				Sampled by:	Danielle Vaillant						
Lab Sample # (lab use only)	Sample Number (YYMMII9999)	Station Number (MB99XXD999) / (MB99XXY999)	Sample Identification	Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type				
	1608JC0229	MB05MJD041	Cartier regional 1 - Raw	09-Aug-16	9:00 AM	6	1	X			
	1608JC0230	MB05MJD042	Cartier regional 2 - Treated	09-Aug-16	9:00 AM	10	1	X			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory. For ALL other testing, please use Laboratory specific forms. DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.								Sample Matrix: 6-Raw Water, 10-Treated Water		Sample Type: 1-Grab Sample	
Relinquished By:		Date & Time:	Aug 9/16 4:30 PM	Received By: (lab use only)	A.K.	Date & Time: (lab use only)	Aug 9/16 4:30	Sample Condition (lab use only) Temperature: 18.6°C Samples Received in Good Condition? Y / N (if no provide details)			
Relinquished By:		Date & Time:		Received By: (lab use only)		Date & Time: (lab use only)					

Operator mandatory Operator optional Operator to fill, if information above has changed Opr to fill, Lab specific pre-filled by DWO

Note: Cyanide and Mercury are not required and have been removed from the list.

Please use the Rev. July 29, 2013 Water System Chemistry List.