Cartier Regional Water Co-op - Headingley Regional - PWS
ATTN: DAVID EPLER
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6000 Portage Avenue
Headingley MB R4H 1E8

Date Received: 23-AUG-21
Report Date: 27-AUG-21 12:03 (MT)
Version: FINAL

Client Phone: 204-832-2555

Certificate of Analysis

Lab Work Order #: L2630173

Project P.O. #: NOT SUBMITTED
Job Reference: HEADINGLEY REGIONAL - PWS 89.40
C of C Numbers:
Legal Site Desc: 57047

Hua Wo
Chemistry Laboratory Manager

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2630173-1 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 1 - RAW	ALS ID: L2630173-2 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 2 - TREATED
Colour, True	CU	15	-	19.6	6.3
Conductivity	umhos/cm	-	-	1030	180
Hardness (as CaCO3)	mg/L	-	-	390 HTC	68.6 HTC
Langelier Index (4 C)	No Unit	-	-	0.89	-0.65
Langelier Index (60 C)	No Unit	-	-	1.6	0.12
pH	pH units	7.00-10.5	-	8.46	7.81
Total Dissolved Solids	mg/L	500	-	680	100
Transmittance, UV (254 nm)	%T/cm	-	-	65.3	98.6
Turbidity	NTU	-	-	9.65	0.66

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2630173-1 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 1 - RAW	ALS ID: L2630173-2 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	228	51.7
Ammonia, Total (as N)	mg/L	-	-	0.127	0.011
Bicarbonate (HCO3)	mg/L	-	-	258	63.1
Bromide (Br)	mg/L	-	-	0.107	<0.010
Carbonate (CO3)	mg/L	-	-	9.96	<0.60
Chloride (Cl)	mg/L	250	-	44.6	4.66
Fluoride (F)	mg/L	-	1.5	0.167	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.171	0.0502
Nitrite (as N)	mg/L	-	1	0.0057	<0.0010
Sulfate (SO4)	mg/L	500	-	257	28.2

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2630173-1 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 1 - RAW	ALS ID: L2630173-2 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-	8.81	<0.50
Total Organic Carbon	mg/L	-	-	8.59	<0.50

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

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.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Total Metals (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2630173-1 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 1 - RAW	ALS ID: L2630173-2 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: HEADINGLEY REGIONAL 2 - TREATED
Aluminum (Al)-Total	mg/L	0.1	2.9	0.330	0.0039
Antimony (Sb)-Total	mg/L	-	0.006	0.00055	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00855	0.00014
Barium (Ba)-Total	mg/L	-	2	0.0840	0.00116
Beryllium (Be)-Total	mg/L	-	-	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.152	0.129
Cadmium (Cd)-Total	mg/L	-	0.005	0.0000227	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	67.7	26.6
Cesium (Cs)-Total	mg/L	-	-	0.000044	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00052	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.00047	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.0278	0.0161
Iron (Fe)-Total	mg/L	0.3	-	0.402	<0.010
Lead (Pb)-Total	mg/L	-	0.005	0.000277	0.000119
Lithium (Li)-Total	mg/L	-	-	0.0748	0.0063
Magnesium (Mg)-Total	mg/L	-	-	53.7	0.534
Manganese (Mn)-Total	mg/L	0.02	0.12	0.0777	0.00622
Molybdenum (Mo)-Total	mg/L	-	-	0.00507	<0.000050
Nickel (Ni)-Total	mg/L	-	-	0.00394	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.157	<0.030
Potassium (K)-Total	mg/L	-	-	17.2	1.13
Rubidium (Rb)-Total	mg/L	-	-	0.00441	0.00026
Selenium (Se)-Total	mg/L	-	0.05	0.000569	<0.000050
Silicon (Si)-Total	mg/L	-	-	8.77	0.74
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	77.9	6.33
Strontium (Sr)-Total	mg/L	-	7	0.368	0.0280
Sulfur (S)-Total	mg/L	-	-	95.1	10.3
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000011	<0.000010
Thorium (Th)-Total	mg/L	-	-	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

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.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Total Metals (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2630173-1 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: **HEADINGLEY REGIONAL 1 - RAW**	ALS ID: L2630173-2 Sampled Date: 23-AUG-21 Sampled Time: 11:00 Sample ID: **HEADINGLEY REGIONAL 2 - TREATED**
Titanium (Ti)-Total	mg/L	-	-	0.00962	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00316	0.000018
Vanadium (V)-Total	mg/L	-	-	0.00591	<0.00050
Zinc (Zn)-Total	mg/L	5	-	<0.0030	0.0049
Zirconium (Zr)-Total	mg/L	-	-	0.00048	<0.00020

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

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.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

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 CO3 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 HCO3-/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 CaCO3)	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 HCO3- and H2CO3 endpoints indicated electrometrically.			
BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR
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 CO2 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 CO2 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-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.			
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-T-CCMS-WP Water Total Metals in Water by CRC ICPMS EPA 200.2/6020B (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP Water Ammonia by colour APHA 4500 NH3 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)

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 evaportaed 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 polyethersulfone (PES) 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

Reference Information

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. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Quality Control Report

Workorder: L2630173 Report Date: 27-AUG-21

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R5568676								
WG3604041-20 DUP		**L2629445-5**						
Alkalinity, Total (as CaCO3)		16.3	16.7		mg/L	2.4	20	24-AUG-21
WG3604041-19 LCS								
Alkalinity, Total (as CaCO3)			99.6		%		85-115	24-AUG-21
WG3604041-16 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	24-AUG-21
BR-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-6 LCS								
Bromide (Br)			95.0		%		85-115	23-AUG-21
WG3602440-5 MB								
Bromide (Br)			<0.010		mg/L		0.01	23-AUG-21
C-DOC-HTC-WP	**Water**							
Batch R5570102								
WG3605141-11 DUP		**L2630069-1**						
Dissolved Organic Carbon		9.16	9.33		mg/L	1.8	20	26-AUG-21
WG3605141-10 LCS								
Dissolved Organic Carbon			106.8		%		80-120	26-AUG-21
WG3605141-9 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	26-AUG-21
WG3605141-12 MS		**L2630069-2**						
Dissolved Organic Carbon			96.9		%		70-130	26-AUG-21
C-TOC-HTC-WP	**Water**							
Batch R5570104								
WG3605148-11 DUP		**L2630069-1**						
Total Organic Carbon		9.08	8.95		mg/L	1.4	20	26-AUG-21
WG3605148-10 LCS								
Total Organic Carbon			105.3		%		80-120	26-AUG-21
WG3605148-9 MB								
Total Organic Carbon			<0.50		mg/L		0.5	26-AUG-21
WG3605148-12 MS		**L2630069-2**						
Total Organic Carbon			96.6		%		70-130	26-AUG-21
CL-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-6 LCS								
Chloride (Cl)			99.3		%		90-110	23-AUG-21
WG3602440-5 MB								

Quality Control Report

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CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-5 MB								
Chloride (Cl)			<0.10		mg/L		0.1	23-AUG-21
COLOUR-TRUE-WP	**Water**							
Batch R5567838								
WG3603756-3 DUP		**L2630173-2**						
Colour, True		6.3	<5.0	RPD-NA	CU	N/A	20	24-AUG-21
WG3603756-2 LCS								
Colour, True			99.7		%		85-115	24-AUG-21
WG3603756-1 MB								
Colour, True			<5.0		CU		5	24-AUG-21
EC-WP	**Water**							
Batch R5568676								
WG3604041-20 DUP		**L2629445-5**						
Conductivity		102	103		umhos/cm	0.5	10	24-AUG-21
WG3604041-18 LCS								
Conductivity			99.3		%		90-110	24-AUG-21
WG3604041-16 MB								
Conductivity			<1.0		umhos/cm		1	24-AUG-21
F-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-6 LCS								
Fluoride (F)			101.8		%		90-110	23-AUG-21
WG3602440-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	23-AUG-21
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-4 DUP		**WG3603283-3**						
Aluminum (Al)-Total		0.0266	0.0275		mg/L	3.3	20	24-AUG-21
Antimony (Sb)-Total		0.0832	0.0822		mg/L	1.2	20	24-AUG-21
Arsenic (As)-Total		0.0979	0.0981		mg/L	0.3	20	24-AUG-21
Barium (Ba)-Total		0.0599	0.0601		mg/L	0.4	20	24-AUG-21
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-21
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-AUG-21
Boron (B)-Total		0.165	0.169		mg/L	2.5	20	24-AUG-21
Cadmium (Cd)-Total		0.0000086	0.0000080		mg/L	8.2	20	24-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-4 DUP		**WG3603283-3**						
Calcium (Ca)-Total		384	380		mg/L	1.1	20	24-AUG-21
Cesium (Cs)-Total		0.000293	0.000294		mg/L	0.4	20	24-AUG-21
Chromium (Cr)-Total		0.00743	0.00724		mg/L	2.6	20	24-AUG-21
Cobalt (Co)-Total		0.0344	0.0344		mg/L	0.2	20	24-AUG-21
Copper (Cu)-Total		0.00178	0.00183		mg/L	2.5	20	24-AUG-21
Iron (Fe)-Total		1.80	1.81		mg/L	0.8	20	24-AUG-21
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-AUG-21
Lithium (Li)-Total		0.0378	0.0375		mg/L	0.8	20	24-AUG-21
Magnesium (Mg)-Total		56.5	57.5		mg/L	1.7	20	24-AUG-21
Manganese (Mn)-Total		0.0919	0.0926		mg/L	0.8	20	24-AUG-21
Molybdenum (Mo)-Total		0.0112	0.0112		mg/L	0.2	20	24-AUG-21
Nickel (Ni)-Total		0.0191	0.0191		mg/L	0.1	20	24-AUG-21
Potassium (K)-Total		59.8	59.6		mg/L	0.3	20	24-AUG-21
Phosphorus (P)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	24-AUG-21
Rubidium (Rb)-Total		0.0316	0.0315		mg/L	0.4	20	24-AUG-21
Selenium (Se)-Total		0.000435	0.000482		mg/L	10	20	24-AUG-21
Silicon (Si)-Total		1.13	1.16		mg/L	2.1	20	24-AUG-21
Silver (Ag)-Total		0.000015	0.000014		mg/L	1.6	20	24-AUG-21
Sodium (Na)-Total		232	236		mg/L	1.5	20	24-AUG-21
Strontium (Sr)-Total		3.12	3.12		mg/L	0.1	20	24-AUG-21
Sulfur (S)-Total		390	389		mg/L	0.2	20	24-AUG-21
Tellurium (Te)-Total		0.00030	0.00025		mg/L	18	20	24-AUG-21
Thallium (Tl)-Total		0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-AUG-21
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-21
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-21
Titanium (Ti)-Total		0.00438	0.00421		mg/L	3.9	20	24-AUG-21
Tungsten (W)-Total		0.00093	0.00093		mg/L	0.2	20	24-AUG-21
Uranium (U)-Total		0.000238	0.000248		mg/L	3.9	20	24-AUG-21
Vanadium (V)-Total		0.00338	0.00336		mg/L	0.8	20	24-AUG-21
Zinc (Zn)-Total		0.0033	<0.0030	RPD-NA	mg/L	N/A	20	24-AUG-21
Zirconium (Zr)-Total		0.00469	0.00464		mg/L	1.2	20	24-AUG-21
WG3603283-2 LCS								
Aluminum (Al)-Total			104.1		%		80-120	24-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-2 LCS								
Antimony (Sb)-Total			106.0		%		80-120	24-AUG-21
Arsenic (As)-Total			102.4		%		80-120	24-AUG-21
Barium (Ba)-Total			103.1		%		80-120	24-AUG-21
Beryllium (Be)-Total			102.8		%		80-120	24-AUG-21
Bismuth (Bi)-Total			101.2		%		80-120	24-AUG-21
Boron (B)-Total			101.9		%		80-120	24-AUG-21
Cadmium (Cd)-Total			102.1		%		80-120	24-AUG-21
Calcium (Ca)-Total			102.6		%		80-120	24-AUG-21
Cesium (Cs)-Total			104.7		%		80-120	24-AUG-21
Chromium (Cr)-Total			101.7		%		80-120	24-AUG-21
Cobalt (Co)-Total			101.8		%		80-120	24-AUG-21
Copper (Cu)-Total			102.1		%		80-120	24-AUG-21
Iron (Fe)-Total			98.7		%		80-120	24-AUG-21
Lead (Pb)-Total			99.1		%		80-120	24-AUG-21
Lithium (Li)-Total			102.6		%		80-120	24-AUG-21
Magnesium (Mg)-Total			109.7		%		80-120	24-AUG-21
Manganese (Mn)-Total			102.8		%		80-120	24-AUG-21
Molybdenum (Mo)-Total			103.3		%		80-120	24-AUG-21
Nickel (Ni)-Total			101.2		%		80-120	24-AUG-21
Potassium (K)-Total			101.3		%		80-120	24-AUG-21
Phosphorus (P)-Total			112.1		%		80-120	24-AUG-21
Rubidium (Rb)-Total			104.7		%		80-120	24-AUG-21
Selenium (Se)-Total			101.4		%		80-120	24-AUG-21
Silicon (Si)-Total			105.1		%		80-120	24-AUG-21
Silver (Ag)-Total			103.8		%		80-120	24-AUG-21
Sodium (Na)-Total			103.1		%		80-120	24-AUG-21
Strontium (Sr)-Total			103.1		%		80-120	24-AUG-21
Sulfur (S)-Total			108.1		%		80-120	24-AUG-21
Tellurium (Te)-Total			96.6		%		80-120	24-AUG-21
Thallium (Tl)-Total			100.6		%		80-120	24-AUG-21
Thorium (Th)-Total			95.2		%		80-120	24-AUG-21
Tin (Sn)-Total			102.6		%		80-120	24-AUG-21
Titanium (Ti)-Total			99.4		%		80-120	24-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8
Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-2 LCS								
Tungsten (W)-Total			98.9		%		80-120	24-AUG-21
Uranium (U)-Total			100.2		%		80-120	24-AUG-21
Vanadium (V)-Total			102.3		%		80-120	24-AUG-21
Zinc (Zn)-Total			102.8		%		80-120	24-AUG-21
Zirconium (Zr)-Total			97.3		%		80-120	24-AUG-21
WG3603283-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	24-AUG-21
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Arsenic (As)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Barium (Ba)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	24-AUG-21
Boron (B)-Total			<0.010		mg/L		0.01	24-AUG-21
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	24-AUG-21
Calcium (Ca)-Total			<0.050		mg/L		0.05	24-AUG-21
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	24-AUG-21
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Copper (Cu)-Total			<0.00050		mg/L		0.0005	24-AUG-21
Iron (Fe)-Total			<0.010		mg/L		0.01	24-AUG-21
Lead (Pb)-Total			<0.000050		mg/L		0.00005	24-AUG-21
Lithium (Li)-Total			<0.0010		mg/L		0.001	24-AUG-21
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	24-AUG-21
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-AUG-21
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	24-AUG-21
Potassium (K)-Total			<0.050		mg/L		0.05	24-AUG-21
Phosphorus (P)-Total			<0.030		mg/L		0.03	24-AUG-21
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	24-AUG-21
Selenium (Se)-Total			<0.000050		mg/L		0.00005	24-AUG-21
Silicon (Si)-Total			<0.10		mg/L		0.1	24-AUG-21
Silver (Ag)-Total			<0.000010		mg/L		0.00001	24-AUG-21
Sodium (Na)-Total			<0.050		mg/L		0.05	24-AUG-21
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	24-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-1 MB								
Sulfur (S)-Total			<0.50		mg/L		0.5	24-AUG-21
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	24-AUG-21
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	24-AUG-21
Thorium (Th)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Tin (Sn)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	24-AUG-21
Tungsten (W)-Total			<0.00010		mg/L		0.0001	24-AUG-21
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-AUG-21
Vanadium (V)-Total			<0.00050		mg/L		0.0005	24-AUG-21
Zinc (Zn)-Total			<0.0030		mg/L		0.003	24-AUG-21
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	24-AUG-21
WG3603283-5 MS		**WG3603283-3**						
Aluminum (Al)-Total			88.8		%		70-130	24-AUG-21
Antimony (Sb)-Total			N/A	MS-B	%		-	24-AUG-21
Arsenic (As)-Total			N/A	MS-B	%		-	24-AUG-21
Barium (Ba)-Total			N/A	MS-B	%		-	24-AUG-21
Beryllium (Be)-Total			85.2		%		70-130	24-AUG-21
Bismuth (Bi)-Total			76.7		%		70-130	24-AUG-21
Boron (B)-Total			N/A	MS-B	%		-	24-AUG-21
Cadmium (Cd)-Total			83.0		%		70-130	24-AUG-21
Calcium (Ca)-Total			N/A	MS-B	%		-	24-AUG-21
Cesium (Cs)-Total			87.6		%		70-130	24-AUG-21
Chromium (Cr)-Total			87.5		%		70-130	24-AUG-21
Cobalt (Co)-Total			N/A	MS-B	%		-	24-AUG-21
Copper (Cu)-Total			80.7		%		70-130	24-AUG-21
Iron (Fe)-Total			82.8		%		70-130	24-AUG-21
Lead (Pb)-Total			78.0		%		70-130	24-AUG-21
Lithium (Li)-Total			85.9		%		70-130	24-AUG-21
Magnesium (Mg)-Total			N/A	MS-B	%		-	24-AUG-21
Manganese (Mn)-Total			N/A	MS-B	%		-	24-AUG-21
Molybdenum (Mo)-Total			92.5		%		70-130	24-AUG-21
Nickel (Ni)-Total			81.0		%		70-130	24-AUG-21
Potassium (K)-Total			N/A	MS-B	%		-	24-AUG-21
Phosphorus (P)-Total			93.0		%		70-130	24-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5569505								
WG3603283-5 MS		**WG3603283-3**						
Rubidium (Rb)-Total			N/A	MS-B	%		-	24-AUG-21
Selenium (Se)-Total			91.7		%		70-130	24-AUG-21
Silicon (Si)-Total			89.7		%		70-130	24-AUG-21
Silver (Ag)-Total			80.9		%		70-130	24-AUG-21
Sodium (Na)-Total			N/A	MS-B	%		-	24-AUG-21
Strontium (Sr)-Total			N/A	MS-B	%		-	24-AUG-21
Sulfur (S)-Total			N/A	MS-B	%		-	24-AUG-21
Tellurium (Te)-Total			87.7		%		70-130	24-AUG-21
Thallium (Tl)-Total			77.7		%		70-130	24-AUG-21
Thorium (Th)-Total			83.7		%		70-130	24-AUG-21
Tin (Sn)-Total			89.5		%		70-130	24-AUG-21
Titanium (Ti)-Total			92.5		%		70-130	24-AUG-21
Tungsten (W)-Total			86.2		%		70-130	24-AUG-21
Uranium (U)-Total			82.1		%		70-130	24-AUG-21
Vanadium (V)-Total			90.6		%		70-130	24-AUG-21
Zinc (Zn)-Total			79.1		%		70-130	24-AUG-21
Zirconium (Zr)-Total			91.9		%		70-130	24-AUG-21
NH3-COL-WP	**Water**							
Batch R5570985								
WG3606151-3 DUP		**L2629970-3**						
Ammonia, Total (as N)		N/A	0.500	J	mg/L	0.144	0.2	26-AUG-21
WG3606151-2 LCS								
Ammonia, Total (as N)			100.4		%		85-115	26-AUG-21
WG3606151-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	26-AUG-21
WG3606151-4 MS		**L2629970-3**						
Ammonia, Total (as N)			N/A	MS-B	%		-	26-AUG-21
NO2-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-7 DUP		**L2630018-1**						
Nitrite (as N)		0.0055	0.0056		mg/L	1.2	20	23-AUG-21
WG3602440-6 LCS								
Nitrite (as N)			102.7		%		90-110	23-AUG-21
WG3602440-5 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	23-AUG-21

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-8 MS		**L2630018-1**						
Nitrite (as N)			103.2		%		75-125	23-AUG-21
NO3-L-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-7 DUP		**L2630018-1**						
Nitrate (as N)		0.0161	0.0170		mg/L	5.3	20	23-AUG-21
WG3602440-6 LCS								
Nitrate (as N)			99.6		%		90-110	23-AUG-21
WG3602440-5 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	23-AUG-21
WG3602440-8 MS		**L2630018-1**						
Nitrate (as N)			99.6		%		75-125	23-AUG-21
PH-WP	**Water**							
Batch R5568676								
WG3604041-20 DUP		**L2629445-5**						
pH		7.34	7.35	J	pH units	0.01	0.2	24-AUG-21
WG3604041-17 LCS								
pH			6.99		pH units		6.9-7.1	24-AUG-21
SO4-IC-N-WP	**Water**							
Batch R5566846								
WG3602440-6 LCS								
Sulfate (SO4)			101.3		%		90-110	23-AUG-21
WG3602440-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	23-AUG-21
TDS-WP	**Water**							
Batch R5569718								
WG3602870-6 DUP		**L2630173-1**						
Total Dissolved Solids		680	673		mg/L	1.0	20	24-AUG-21
WG3602870-5 LCS								
Total Dissolved Solids			95.8		%		85-115	24-AUG-21
WG3602870-4 MB								
Total Dissolved Solids			<4.0		mg/L		4	24-AUG-21
TURBIDITY-WP	**Water**							

Quality Control Report

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WP	**Water**							
Batch R5567304								
WG3603471-6 DUP		**L2629445-21**						
Turbidity		<0.10	<0.10	RPD-NA	NTU	N/A	15	24-AUG-21
WG3603471-5 LCS								
Turbidity			105.5		%		85-115	24-AUG-21
WG3603471-4 MB								
Turbidity			<0.10		NTU		0.1	24-AUG-21
UV-%TRANS-WP	**Water**							
Batch R5570065								
WG3604278-3 DUP		**L2630806-1**						
Transmittance, UV (254 nm)		60.4	61.1		%T/cm	1.2	20	25-AUG-21
WG3604278-1 IRM		**BLANK**						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	25-AUG-21
WG3604278-2 LCS								
Transmittance, UV (254 nm)			95.5		%		85-115	25-AUG-21

Quality Control Report

Workorder: L2630173 Report Date: 27-AUG-21

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2630173 Report Date: 27-AUG-21

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8
Contact: DAVID EPLER

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	23-AUG-21 11:00	24-AUG-21 12:00	0.25	25	hours	EHTR-FM
	2	23-AUG-21 11:00	24-AUG-21 12:00	0.25	25	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2630173 were received on 23-AUG-21 12:25.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba

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

L2630173-COFC

Regular Service (default):	☐ Regular Service (is 5-7 Days):
Unless otherwise requested	☐ **1 Day, rush / priority** ☐ **2 Day, rush / priority** ☐ **3 Day, rush / priority**

Report to Operator (email PDF):	
Contact:	David Epler
Address:	6000 Portage Ave, Headingley, MB R4H 1E8
Phone:	(204) 832-2555
Email:	headingleywtp@crwc.ca; Tyler.Foxton2@gov.mb.ca

Report to Owner (email PDF):	
Contact:	Robert Poirier
Address:	6000 Portage Avenue, Headingley, MB R4H 1E8
Phone:	(204) 960-3569
Email:	robert.poirier@icloud.com; headingleywtp@crwc.ca; angela.meier@gov.mb.ca; dvaillant@crwc.ca

Email PDF copy to:	
DWO:	Amanda Fewings
DWO Address:	1007 Century St., Winnipeg, MB R3H0W4
DWO Phone:	(204) 795-9614
DWO Email:	amanda.fewings@gov.mb.ca
Additional Email:	Joern.Muenster@gov.mb.ca; Nancy.Eidse@gov.mb.ca

If an update in Owner or Operator contact information is required, please contact your Drinking Water Officer

Client / Project Information:	**Lab:**	**Account:**	Agency Code: 382	Report Type: EMS (Lab-MWS)	Project: DWQ-C

Operation Name:	HEADINGLEY REGIONAL - PWS
Operation Code:	89.40
Operation ID:	57047
Sampled by:	Nathan B Harris

Expected Sample Time: **August-2021**

Please record Free & Total Chlorine residuals for Distribution By-product Sampling

DO NOT COPY or RE-USE this form. Sample Number are unique to the Office of Drinking Water and provided by Drinking Water Officer.

Sample Number	Station Number	Sample Identification	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	Sample Type	MB-CH-PWS-V2013	# of Containers
2108AF5009	MB05MJD481	Headingley Regional 1 - Raw			23-08-2021	11:00am	6	1	X	4
2108AF5010	MB05MJD482	Headingley Regional 2 - Treated	1.31	1.35	23-08-2021	11:00am	10	1	X	4

Failure to complete all portions of this form may delay analysis.

Please fill in this form LEGIBLY.

Sample Matrix: 6-Raw Water, 9-Distributed Water, 10-Treated Water

Sample Type: 1-Grab Sample

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.

Relinquished By:	Nathan B Harris	Date & Time	Aug 23/11:00AM	Validated By (lab use only):	Date & Time:
				Sample Condition (lab use only)	
Received By: (lab use only)	O. A.	Date & Time: (lab use only)	23/8/21, 12:25pm	Temperature 20.4°C	Samples Received in Good Condition? **Y / N**