



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

Date Received: 24-MAY-17
Report Date: 30-MAY-17 15:29 (MT)
Version: FINAL

Client Phone: 204-832-2555

Certificate of Analysis

Lab Work Order #: L1930845
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

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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Physical Tests (WATER)

		ALS ID		L1930845-1	L1930845-2
		Sampled Date		24-MAY-17	24-MAY-17
		Sampled Time		09:45	09:45
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	26.0	<5.0
Conductivity	umhos/cm	-	-	861	181
Hardness (as CaCO ₃)	mg/L	-	-	378 HTC	75.7 HTC
Langelier Index (4 C)	No Unit	-	-	1.0	-0.66
Langelier Index (60 C)	No Unit	-	-	1.8	0.11
pH	pH units	7.00-10.5	-	8.55	7.75
Total Dissolved Solids	mg/L	500	-	567	105
Transmittance, UV (254 nm)	%T/cm	-	-	52.6	99.8
Turbidity	NTU	-	-	14.0	<0.10

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

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

		ALS ID		L1930845-1	L1930845-2
		Sampled Date		24-MAY-17	24-MAY-17
		Sampled Time		09:45	09:45
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO ₃)	mg/L	-	-	236	53.1
Ammonia, Total (as N)	mg/L	-	-	0.021	<0.010
Bicarbonate (HCO ₃)	mg/L	-	-	265	64.8
Bromide (Br)	mg/L	-	-	<0.20 DLM	<0.10
Carbonate (CO ₃)	mg/L	-	-	11.3	<0.60
Chloride (Cl)	mg/L	250	-	18.2	1.42
Fluoride (F)	mg/L	-	1.5	0.130	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	<0.010 DLM	<0.0050
Nitrite (as N)	mg/L	-	1	<0.0010	<0.0010
Sulfate (SO ₄)	mg/L	500	-	187	29.8

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

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Organic / Inorganic Carbon (WATER)

		ALS ID		L1930845-1	L1930845-2
		Sampled Date		24-MAY-17	24-MAY-17
		Sampled Time		09:45	09:45
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	11.1	<0.50
Total Organic Carbon	mg/L	-	-	10.6	<0.50

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

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

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)

		ALS ID		L1930845-1	L1930845-2
		Sampled Date		24-MAY-17	24-MAY-17
		Sampled Time		09:45	09:45
		Sample ID		HEADINGLEY	HEADINGLEY
				REGIONAL 1 -	REGIONAL 2 -
Analyte	Unit	Guide Limit #1	Guide Limit #2	RAW	TREATED
Aluminum (Al)-Total	mg/L	0.1	-	0.385	0.0077
Antimony (Sb)-Total	mg/L	-	0.006	0.00029	<0.00020
Arsenic (As)-Total	mg/L	-	0.01	0.00309	<0.00020
Barium (Ba)-Total	mg/L	-	1	0.0623	0.00162
Beryllium (Be)-Total	mg/L	-	-	<0.00020	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	<0.00020	<0.00020
Boron (B)-Total	mg/L	-	5	0.072	0.054
Cadmium (Cd)-Total	mg/L	-	0.005	0.000017	<0.000010
Calcium (Ca)-Total	mg/L	-	-	71.9	29.1
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	-	-	0.00052	<0.00020
Copper (Cu)-Total	mg/L	1	-	0.00423	0.00420
Iron (Fe)-Total	mg/L	0.3	-	0.444	<0.010
Lead (Pb)-Total	mg/L	-	0.01	0.000242	0.000272
Lithium (Li)-Total	mg/L	-	-	0.0533	0.0022
Magnesium (Mg)-Total	mg/L	-	-	48.3	0.751
Manganese (Mn)-Total	mg/L	0.05	-	0.0800	<0.00030
Molybdenum (Mo)-Total	mg/L	-	-	0.00285	<0.00020
Nickel (Ni)-Total	mg/L	-	-	0.0045	<0.0020
Phosphorus (P)-Total	mg/L	-	-	<0.10	<0.10
Potassium (K)-Total	mg/L	-	-	12.4	0.358
Rubidium (Rb)-Total	mg/L	-	-	0.00214	<0.00020
Selenium (Se)-Total	mg/L	-	0.05	<0.0010	<0.0010
Silicon (Si)-Total	mg/L	-	-	5.83	0.18
Silver (Ag)-Total	mg/L	-	-	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	200	-	53.3	6.16
Strontium (Sr)-Total	mg/L	-	-	0.301	0.0654
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.00010	<0.00010
Thorium (Th)-Total	mg/L	-	-	0.00012	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00020	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0110	<0.00050

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

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

 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)

		ALS ID		L1930845-1	L1930845-2
		Sampled Date		24-MAY-17	24-MAY-17
		Sampled Time		09:45	09:45
		Sample ID		HEADINGLEY	HEADINGLEY
				REGIONAL 1 -	REGIONAL 2 -
				RAW	TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00517	<0.00010
Vanadium (V)-Total	mg/L	-	-	0.00380	<0.00020
Zinc (Zn)-Total	mg/L	5	-	<0.0020	0.0056
Zirconium (Zr)-Total	mg/L	-	-	0.00058	<0.00040

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

#1: GCDWQ - Aesthetic Objective/Other Value

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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).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

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-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 CaCO ₃ 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

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

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:

$$\text{Ion Balance (\%)} = [\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$$

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL
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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 NH3 F
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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)
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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)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WP	Water	pH	APHA 4500H
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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)
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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
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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)
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Turbidity in aqueous matrices is determined by the nephelometric method.

UV-%TRANS-WP	Water	UV Transmittance (Calculated)	APHA 5910B
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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 ww - 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.

Quality Control Report

Workorder: L1930845

Report Date: 30-MAY-17

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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
CL-L-IC-N-WP		Water						
Batch	R3733703							
WG2534652-1	MB							
Chloride (Cl)			<0.10		mg/L		0.1	25-MAY-17
COLOUR-TRUE-WP		Water						
Batch	R3732265							
WG2534618-3	DUP	L1929671-1						
Colour, True		18.0	16.9		CU	5.9	20	25-MAY-17
WG2534618-2	LCS							
Colour, True			100.2		%		85-115	25-MAY-17
WG2534618-1	MB							
Colour, True			<5.0		CU		5	25-MAY-17
EC-WP		Water						
Batch	R3733144							
WG2536090-5	DUP	L1931151-1						
Conductivity		794	794		umhos/cm	0.0	10	26-MAY-17
WG2536090-3	LCS							
Conductivity			99.9		%		90-110	26-MAY-17
WG2536090-1	MB							
Conductivity			<1.0		umhos/cm		1	26-MAY-17
F-IC-N-WP		Water						
Batch	R3733703							
WG2534652-2	LCS							
Fluoride (F)			95.2		%		90-110	25-MAY-17
WG2534652-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	25-MAY-17
MET-T-L-MS-WP		Water						
Batch	R3732621							
WG2535342-4	DUP	WG2535342-3						
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-MAY-17
Antimony (Sb)-Total		0.00022	0.00021		mg/L	3.2	20	26-MAY-17
Arsenic (As)-Total		0.00205	0.00205		mg/L	0.3	20	26-MAY-17
Barium (Ba)-Total		0.477	0.486		mg/L	1.7	20	26-MAY-17
Beryllium (Be)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Bismuth (Bi)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Boron (B)-Total		0.053	0.052		mg/L	2.1	20	26-MAY-17
Cadmium (Cd)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-MAY-17

Quality Control Report

Workorder: L1930845

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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-L-MS-WP		Water						
Batch	R3732621							
WG2535342-4 DUP		WG2535342-3						
Calcium (Ca)-Total		109	106		mg/L	2.4	20	26-MAY-17
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-MAY-17
Chromium (Cr)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-MAY-17
Cobalt (Co)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Copper (Cu)-Total		0.0122	0.0129		mg/L	5.3	20	26-MAY-17
Iron (Fe)-Total		0.112	0.117		mg/L	4.4	20	26-MAY-17
Lead (Pb)-Total		0.000989	0.000933		mg/L	5.8	20	26-MAY-17
Lithium (Li)-Total		0.0266	0.0259		mg/L	2.8	20	26-MAY-17
Magnesium (Mg)-Total		52.8	52.3		mg/L	1.0	20	26-MAY-17
Manganese (Mn)-Total		0.0333	0.0321		mg/L	3.6	20	26-MAY-17
Molybdenum (Mo)-Total		0.00129	0.00124		mg/L	3.7	20	26-MAY-17
Nickel (Ni)-Total		0.0026	0.0027		mg/L	3.1	20	26-MAY-17
Phosphorus (P)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	26-MAY-17
Potassium (K)-Total		4.66	4.57		mg/L	2.0	20	26-MAY-17
Rubidium (Rb)-Total		0.00090	0.00094		mg/L	4.5	20	26-MAY-17
Selenium (Se)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-MAY-17
Silicon (Si)-Total		11.9	11.8		mg/L	1.5	20	26-MAY-17
Silver (Ag)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-MAY-17
Sodium (Na)-Total		26.7	26.3		mg/L	1.5	20	26-MAY-17
Strontium (Sr)-Total		0.403	0.391		mg/L	3.0	20	26-MAY-17
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-MAY-17
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-MAY-17
Tin (Sn)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Titanium (Ti)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-MAY-17
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-MAY-17
Uranium (U)-Total		0.0107	0.0107		mg/L	0.3	20	26-MAY-17
Vanadium (V)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-MAY-17
Zinc (Zn)-Total		0.0296	0.0269		mg/L	9.5	20	26-MAY-17
Zirconium (Zr)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	26-MAY-17
WG2535342-2 LCS								
Aluminum (Al)-Total			102.6		%		80-120	26-MAY-17
Antimony (Sb)-Total			94.8		%		80-120	26-MAY-17



Quality Control Report

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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-L-MS-WP		Water						
Batch	R3732621							
WG2535342-2		LCS						
Arsenic (As)-Total			102.4		%		80-120	26-MAY-17
Barium (Ba)-Total			100.7		%		80-120	26-MAY-17
Beryllium (Be)-Total			93.9		%		80-120	26-MAY-17
Bismuth (Bi)-Total			99.3		%		80-120	26-MAY-17
Boron (B)-Total			97.9		%		80-120	26-MAY-17
Cadmium (Cd)-Total			100.8		%		80-120	26-MAY-17
Calcium (Ca)-Total			97.5		%		80-120	26-MAY-17
Cesium (Cs)-Total			103.9		%		80-120	26-MAY-17
Chromium (Cr)-Total			100.6		%		80-120	26-MAY-17
Cobalt (Co)-Total			102.4		%		80-120	26-MAY-17
Copper (Cu)-Total			101.6		%		80-120	26-MAY-17
Iron (Fe)-Total			100.0		%		80-120	26-MAY-17
Lead (Pb)-Total			100.5		%		80-120	26-MAY-17
Lithium (Li)-Total			94.7		%		80-120	26-MAY-17
Magnesium (Mg)-Total			103.9		%		80-120	26-MAY-17
Manganese (Mn)-Total			102.3		%		80-120	26-MAY-17
Molybdenum (Mo)-Total			100.5		%		80-120	26-MAY-17
Nickel (Ni)-Total			101.7		%		80-120	26-MAY-17
Phosphorus (P)-Total			103.7		%		80-120	26-MAY-17
Potassium (K)-Total			103.3		%		80-120	26-MAY-17
Rubidium (Rb)-Total			105.0		%		80-120	26-MAY-17
Selenium (Se)-Total			95.0		%		80-120	26-MAY-17
Silicon (Si)-Total			109.8		%		80-120	26-MAY-17
Silver (Ag)-Total			106.2		%		80-120	26-MAY-17
Sodium (Na)-Total			104.7		%		80-120	26-MAY-17
Strontium (Sr)-Total			107.8		%		80-120	26-MAY-17
Tellurium (Te)-Total			92.6		%		80-120	26-MAY-17
Thallium (Tl)-Total			96.5		%		80-120	26-MAY-17
Thorium (Th)-Total			102.1		%		80-120	26-MAY-17
Tin (Sn)-Total			97.9		%		80-120	26-MAY-17
Titanium (Ti)-Total			101.6		%		80-120	26-MAY-17
Tungsten (W)-Total			107.4		%		80-120	26-MAY-17
Uranium (U)-Total			105.9		%		80-120	26-MAY-17

Quality Control Report

Workorder: L1930845

Report Date: 30-MAY-17

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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-L-MS-WP		Water						
Batch	R3732621							
WG2535342-2 LCS								
Vanadium (V)-Total			103.9		%		80-120	26-MAY-17
Zinc (Zn)-Total			95.7		%		80-120	26-MAY-17
Zirconium (Zr)-Total			101.8		%		80-120	26-MAY-17
WG2535342-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	26-MAY-17
Antimony (Sb)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Arsenic (As)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Barium (Ba)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Beryllium (Be)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Boron (B)-Total			<0.010		mg/L		0.01	26-MAY-17
Cadmium (Cd)-Total			<0.000010		mg/L		0.00001	26-MAY-17
Calcium (Ca)-Total			<0.10		mg/L		0.1	26-MAY-17
Cesium (Cs)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Chromium (Cr)-Total			<0.0010		mg/L		0.001	26-MAY-17
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Copper (Cu)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Iron (Fe)-Total			<0.010		mg/L		0.01	26-MAY-17
Lead (Pb)-Total			<0.000090		mg/L		0.00009	26-MAY-17
Lithium (Li)-Total			<0.0020		mg/L		0.002	26-MAY-17
Magnesium (Mg)-Total			<0.010		mg/L		0.01	26-MAY-17
Manganese (Mn)-Total			<0.00030		mg/L		0.0003	26-MAY-17
Molybdenum (Mo)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Nickel (Ni)-Total			<0.0020		mg/L		0.002	26-MAY-17
Phosphorus (P)-Total			<0.10		mg/L		0.1	26-MAY-17
Potassium (K)-Total			<0.020		mg/L		0.02	26-MAY-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Selenium (Se)-Total			<0.0010		mg/L		0.001	26-MAY-17
Silicon (Si)-Total			<0.10		mg/L		0.1	26-MAY-17
Silver (Ag)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Sodium (Na)-Total			<0.030		mg/L		0.03	26-MAY-17
Strontium (Sr)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Thallium (Tl)-Total			<0.00010		mg/L		0.0001	26-MAY-17

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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-L-MS-WP		Water						
Batch	R3732621							
WG2535342-1 MB								
Thorium (Th)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Tin (Sn)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Titanium (Ti)-Total			<0.00050		mg/L		0.0005	26-MAY-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Uranium (U)-Total			<0.00010		mg/L		0.0001	26-MAY-17
Vanadium (V)-Total			<0.00020		mg/L		0.0002	26-MAY-17
Zinc (Zn)-Total			<0.0020		mg/L		0.002	26-MAY-17
Zirconium (Zr)-Total			<0.00040		mg/L		0.0004	26-MAY-17
WG2535342-5 MS		WG2535342-3						
Aluminum (Al)-Total			104.4		%		70-130	26-MAY-17
Antimony (Sb)-Total			107.0		%		70-130	26-MAY-17
Arsenic (As)-Total			96.8		%		70-130	26-MAY-17
Barium (Ba)-Total			N/A	MS-B	%		-	26-MAY-17
Beryllium (Be)-Total			92.2		%		70-130	26-MAY-17
Bismuth (Bi)-Total			96.7		%		70-130	26-MAY-17
Boron (B)-Total			104.8		%		70-130	26-MAY-17
Cadmium (Cd)-Total			95.9		%		70-130	26-MAY-17
Calcium (Ca)-Total			N/A	MS-B	%		-	26-MAY-17
Cesium (Cs)-Total			102.5		%		70-130	26-MAY-17
Chromium (Cr)-Total			102.9		%		70-130	26-MAY-17
Cobalt (Co)-Total			99.4		%		70-130	26-MAY-17
Copper (Cu)-Total			90.9		%		70-130	26-MAY-17
Iron (Fe)-Total			102.0		%		70-130	26-MAY-17
Lead (Pb)-Total			101.5		%		70-130	26-MAY-17
Lithium (Li)-Total			90.0		%		70-130	26-MAY-17
Magnesium (Mg)-Total			N/A	MS-B	%		-	26-MAY-17
Manganese (Mn)-Total			N/A	MS-B	%		-	26-MAY-17
Molybdenum (Mo)-Total			107.0		%		70-130	26-MAY-17
Nickel (Ni)-Total			96.0		%		70-130	26-MAY-17
Phosphorus (P)-Total			98.0		%		70-130	26-MAY-17
Potassium (K)-Total			N/A	MS-B	%		-	26-MAY-17
Rubidium (Rb)-Total			106.3		%		70-130	26-MAY-17
Selenium (Se)-Total			92.4		%		70-130	26-MAY-17
Silicon (Si)-Total			N/A	MS-B	%		-	26-MAY-17

Quality Control Report

Workorder: L1930845

Report Date: 30-MAY-17

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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-L-MS-WP		Water						
Batch	R3732621							
WG2535342-5 MS		WG2535342-3						
Silver (Ag)-Total			104.2		%		70-130	26-MAY-17
Sodium (Na)-Total			N/A	MS-B	%		-	26-MAY-17
Strontium (Sr)-Total			N/A	MS-B	%		-	26-MAY-17
Tellurium (Te)-Total			84.8		%		70-130	26-MAY-17
Thallium (Tl)-Total			104.3		%		70-130	26-MAY-17
Thorium (Th)-Total			103.9		%		70-130	26-MAY-17
Tin (Sn)-Total			102.2		%		70-130	26-MAY-17
Titanium (Ti)-Total			104.6		%		70-130	26-MAY-17
Tungsten (W)-Total			103.9		%		70-130	26-MAY-17
Uranium (U)-Total			N/A	MS-B	%		-	26-MAY-17
Vanadium (V)-Total			106.8		%		70-130	26-MAY-17
Zinc (Zn)-Total			89.5		%		70-130	26-MAY-17
Zirconium (Zr)-Total			103.6		%		70-130	26-MAY-17
NH3-COL-WP		Water						
Batch	R3731962							
WG2534776-7 DUP		L1930745-1						
Ammonia, Total (as N)		0.051	0.043		mg/L	17	20	26-MAY-17
WG2534776-6 LCS			104.2		%		85-115	25-MAY-17
WG2534776-5 MB			<0.010		mg/L		0.01	25-MAY-17
WG2534776-8 MS		L1930745-1	80.9		%		75-125	25-MAY-17
NO2-L-IC-N-WP		Water						
Batch	R3733703							
WG2534652-3 DUP		L1930252-3						
Nitrite (as N)		<0.0050	<0.0010	RPD-NA	mg/L	N/A	20	25-MAY-17
WG2534652-2 LCS			94.4		%		90-110	25-MAY-17
WG2534652-1 MB			<0.0010		mg/L		0.001	25-MAY-17
WG2534652-4 MS		L1930252-3	82.6		%		75-125	25-MAY-17



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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	R3734729							
WG2536448-2	LCS							
Nitrite (as N)			99.6		%		90-110	27-MAY-17
NO3-L-IC-N-WP	Water							
Batch	R3733703							
WG2534652-3	DUP	L1930252-3						
Nitrate (as N)		<0.025	0.0058	RPD-NA	mg/L	N/A	20	25-MAY-17
WG2534652-2	LCS							
Nitrate (as N)			95.7		%		90-110	25-MAY-17
WG2534652-1	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	25-MAY-17
WG2534652-4	MS	L1930252-3						
Nitrate (as N)			84.8		%		75-125	25-MAY-17
PH-WP	Water							
Batch	R3731894							
WG2535216-8	DUP	L1930845-1						
pH		8.55	8.55	J	pH units	0.00	0.2	25-MAY-17
WG2535216-6	LCS							
pH			7.40		pH units		7.3-7.5	25-MAY-17
SO4-IC-N-WP	Water							
Batch	R3733703							
WG2534652-2	LCS							
Sulfate (SO4)			94.5		%		90-110	25-MAY-17
WG2534652-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	25-MAY-17
TDS-WP	Water							
Batch	R3733604							
WG2533884-3	DUP	L1929617-1						
Total Dissolved Solids		512	516		mg/L	0.7	20	26-MAY-17
WG2533884-2	LCS							
Total Dissolved Solids			102.4		%		85-115	26-MAY-17
WG2533884-1	MB							
Total Dissolved Solids			<10		mg/L		10	26-MAY-17
TURBIDITY-WP	Water							



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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	R3735411							
WG2534621-3	DUP	L1930695-1						
Turbidity		27.1	27.4		NTU	1.1	15	25-MAY-17
WG2534621-2	LCS							
Turbidity			99.0		%		85-115	25-MAY-17
WG2534621-1	MB							
Turbidity			<0.10		NTU		0.1	25-MAY-17
UV-%TRANS-WP		Water						
Batch	R3732025							
WG2535171-3	DUP	L1929671-1						
Transmittance, UV (254 nm)		58.9	59.0		%T/cm	0.2	20	25-MAY-17
WG2535171-1	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	25-MAY-17
WG2535171-2	LCS							
Transmittance, UV (254 nm)			100.1		%		85-115	25-MAY-17

Quality Control Report

Workorder: L1930845

Report Date: 30-MAY-17

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

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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: L1930845

Report Date: 30-MAY-17

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

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	24-MAY-17 09:45	25-MAY-17 12:00	0.25	26	hours	EHTR-FM
	2	24-MAY-17 09:45	25-MAY-17 12:00	0.25	26	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 L1930845 were received on 24-MAY-17 14:50.

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



L1930845-COFC

ONLY FOR

Samples

L1930845

Report to Operator (email pdf):				Owner billing (Email):				Regular Service (default):		Regular Service (is 5-7 Days):		
Contact:	David Epler, Lead Operator - CRWC - Headingley			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:	6000 Portage Ave.			Address:	Unit 1A - 2010 Currie Blvd. Brandon MB R7B 4E7							
Phone:	204-832-2555			Phone:	204-729-6094							
Email:	headingleywtp@crwc.ca; angela.meier@gov.mb.ca			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:				Contact:				DWO:	Michaela Samek			
Address:				Address:				DWO Address:	1			
Phone:				Phone:				DWO Phone:	204-362-2704			
Email:				Email:				DWO Email:	michaela.samek@gov.mb.ca			
Account:	W7374	ODW Report type:	EMS (Lab-MWS)	Client / Project Information:					Analysis Request			
Agency Code:	382	Project:	DWQ-C	Operation Name:	HEADINGLEY REGIONAL - PWS					MB-CH-PWS-V2013 Number of Containers		
Lab:	ALS	Lab Work Order # / Job # (lab use only)		Operation Code (com code):	89.40							
				Operation Id:	57047							
				Sampled by:	David Epler							
Lab Sample # (lab use only)	Sample Number (YYMMII9999)	Station Number (MB99XXD999) / (MB99XXV999)	Sample Identification		Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type				
	1606JC0027	MB05MJD481	Headingley regional 1 - Raw		24/05/12	9:45	6	1	X		5	
	1606JC0028	MB05MJD482	Headingley regional 2 - Treated		24/05/12	9:45	10	1	X		5	
Failure to complete all portions of this form may delay analysis.					Sample Matrix:		Sample Type:					
Please fill in this form LEGIBLY.					6-Raw Water, 10-Treated Water		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. DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.												
Relinquished By:		Date & Time: May 24/2012	Received By: (lab use only)	David I.	Date & Time: 24-5-12	Sample Condition (lab use only)						
					2:50pm	Temperature		Samples Received in Good Condition? Y / N (if no provide details)				
Relinquished By:		Date & Time: May 24/2012	Received By: (lab use only)			R-1						

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.