



Town of The Pas - Water Plant
ATTN: RYAN LAGACE
Town of The Pas
Box 870
The Pas MB R9A 1K8

Date Received: 24-OCT-17
Report Date: 31-OCT-17 13:20 (MT)
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Client Phone: 204-620-0426

Certificate of Analysis

Lab Work Order #: L2012199
Project P.O. #: NOT SUBMITTED
Job Reference: THE PAS - PWS 226.00
C of C Numbers:
Legal Site Desc: 11490

Hua Wo
Chemistry Laboratory Manager

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ANALYTICAL REPORT

Physical Tests (WATER)

		ALS ID		L2012199-1	L2012199-2
		Sampled Date		23-OCT-17	23-OCT-17
		Sampled Time		14:00	14:00
		Sample ID		THE PAS 1 - RAW	THE PAS 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	10.7	<5.0
Conductivity	umhos/cm	-	-	333	337
Hardness (as CaCO3)	mg/L	-	-	170 ^{HTC}	155 ^{HTC}
Langelier Index (4 C)	No Unit	-	-	0.18	-0.76
Langelier Index (60 C)	No Unit	-	-	0.95	0.0086
pH	pH units	7.00-10.5	-	8.11	7.29
Total Dissolved Solids	mg/L	500	-	235	240
Transmittance, UV (254 nm)	%T/cm	-	-	68.5	87.5
Turbidity	NTU	-	-	124	0.28

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		L2012199-1	L2012199-2
		Sampled Date		23-OCT-17	23-OCT-17
		Sampled Time		14:00	14:00
		Sample ID		THE PAS 1 - RAW	THE PAS 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO3)	mg/L	-	-	139	112
Ammonia, Total (as N)	mg/L	-	-	0.049	<0.010
Bicarbonate (HCO3)	mg/L	-	-	169	137
Bromide (Br)	mg/L	-	-	0.022	<0.010
Carbonate (CO3)	mg/L	-	-	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	8.86	12.3
Fluoride (F)	mg/L	-	1.5	0.128	0.083
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.0388	0.0376
Nitrite (as N)	mg/L	-	1	<0.0010	<0.0010
Sulfate (SO4)	mg/L	500	-	48.1	66.6

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		L2012199-1	L2012199-2
		Sampled Date		23-OCT-17	23-OCT-17
		Sampled Time		14:00	14:00
		Sample ID		THE PAS 1 - RAW	THE PAS 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	7.72	5.02
Total Organic Carbon	mg/L	-	-	9.89	5.90

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		L2012199-1	L2012199-2
		Sampled Date		23-OCT-17	23-OCT-17
		Sampled Time		14:00	14:00
		Sample ID		THE PAS 1 - RAW	THE PAS 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Aluminum (Al)-Total	mg/L	0.1	-	0.507	0.0243
Antimony (Sb)-Total	mg/L	-	0.006	0.00018	0.00016
Arsenic (As)-Total	mg/L	-	0.01	0.00174	0.00035
Barium (Ba)-Total	mg/L	-	1	0.0874	0.0622
Beryllium (Be)-Total	mg/L	-	-	0.00011	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.026	0.025
Cadmium (Cd)-Total	mg/L	-	0.005	0.0000933	0.0000107
Calcium (Ca)-Total	mg/L	-	-	38.7	35.6
Cesium (Cs)-Total	mg/L	-	-	0.000041	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00072	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.00112	<0.00010
Copper (Cu)-Total	mg/L	1	-	0.0103	0.00226
Iron (Fe)-Total	mg/L	0.3	-	1.72	<0.010
Lead (Pb)-Total	mg/L	-	0.01	0.00225	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0115	0.0063
Magnesium (Mg)-Total	mg/L	-	-	17.7	16.2
Manganese (Mn)-Total	mg/L	0.05	-	0.0758	0.00658
Molybdenum (Mo)-Total	mg/L	-	-	0.000695	0.000956
Nickel (Ni)-Total	mg/L	-	-	0.00334	0.00115
Phosphorus (P)-Total	mg/L	-	-	0.092	<0.050
Potassium (K)-Total	mg/L	-	-	2.69	2.47
Rubidium (Rb)-Total	mg/L	-	-	0.00201	0.00089
Selenium (Se)-Total	mg/L	-	0.05	0.000167	0.000175
Silicon (Si)-Total	mg/L	-	-	1.60	0.81
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	17.9	16.3
Strontium (Sr)-Total	mg/L	-	-	0.253	0.236
Sulfur (S)-Total	mg/L	-	-	16.9	23.3
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000013	<0.000010
Thorium (Th)-Total	mg/L	-	-	0.00017	<0.00010
Tin (Sn)-Total	mg/L	-	-	0.00011	<0.00010

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

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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.

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

Total Metals (WATER)

		ALS ID		L2012199-1	L2012199-2
		Sampled Date		23-OCT-17	23-OCT-17
		Sampled Time		14:00	14:00
		Sample ID		THE PAS 1 - RAW	THE PAS 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Titanium (Ti)-Total	mg/L	-	-	0.00788	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.000916	0.000191
Vanadium (V)-Total	mg/L	-	-	0.00275	<0.00050
Zinc (Zn)-Total	mg/L	5	-	0.0153	0.0037
Zirconium (Zr)-Total	mg/L	-	-	0.00108	<0.000060

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

#1: GCDWQ - Aesthetic Objective/Other Value

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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.

* 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 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-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 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 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**
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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:

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

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



Quality Control Report

Workorder: L2012199

Report Date: 31-OCT-17

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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP								
	Water							
Batch	R3866942							
WG2649014-5	DUP	L2012186-1						
Alkalinity, Total (as CaCO3)		392	395		mg/L	0.7	20	25-OCT-17
WG2649014-4	LCS							
Alkalinity, Total (as CaCO3)			102.8		%		85-115	25-OCT-17
WG2649014-1	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	25-OCT-17
BR-L-IC-N-WP								
	Water							
Batch	R3867682							
WG2647164-2	LCS							
Bromide (Br)			102.8		%		85-115	24-OCT-17
WG2647164-1	MB							
Bromide (Br)			<0.010		mg/L		0.01	24-OCT-17
C-DOC-HTC-WP								
	Water							
Batch	R3869036							
WG2651412-3	DUP	L2012199-1						
Dissolved Organic Carbon		7.72	7.94		mg/L	2.8	20	27-OCT-17
WG2651412-2	LCS							
Dissolved Organic Carbon			93.6		%		80-120	27-OCT-17
WG2651412-1	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	27-OCT-17
WG2651412-4	MS	L2012199-2						
Dissolved Organic Carbon			104.4		%		70-130	27-OCT-17
C-TOC-HTC-WP								
	Water							
Batch	R3869042							
WG2651415-3	DUP	L2012199-1						
Total Organic Carbon		9.89	9.85		mg/L	0.4	20	27-OCT-17
WG2651415-2	LCS							
Total Organic Carbon			93.8		%		80-120	27-OCT-17
WG2651415-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	27-OCT-17
WG2651415-4	MS	L2012199-2						
Total Organic Carbon			102.2		%		70-130	27-OCT-17
CL-L-IC-N-WP								
	Water							
Batch	R3867682							
WG2647164-3	DUP	WG2647164-5						
Chloride (Cl)		12.1	12.1		mg/L	0.4	20	24-OCT-17
WG2647164-2	LCS							



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Client: Town of The Pas - Water Plant
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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP		Water						
Batch	R3867682							
WG2647164-2	LCS							
Chloride (Cl)			99.8		%		90-110	24-OCT-17
WG2647164-1	MB							
Chloride (Cl)			<0.10		mg/L		0.1	24-OCT-17
WG2647164-4	MS	WG2647164-5						
Chloride (Cl)			93.0		%		75-125	24-OCT-17
COLOUR-TRUE-WP		Water						
Batch	R3870923							
WG2653101-3	DUP	L2011773-1						
Colour, True		8.0	7.4		CU	7.7	20	26-OCT-17
WG2653101-2	LCS							
Colour, True			104.8		%		85-115	26-OCT-17
WG2653101-1	MB							
Colour, True			<5.0		CU		5	26-OCT-17
EC-WP		Water						
Batch	R3866942							
WG2649014-5	DUP	L2012186-1						
Conductivity		1630	1590		umhos/cm	2.5	10	25-OCT-17
WG2649014-3	LCS							
Conductivity			99.7		%		90-110	25-OCT-17
WG2649014-1	MB							
Conductivity			<1.0		umhos/cm		1	25-OCT-17
F-IC-N-WP		Water						
Batch	R3867682							
WG2647164-3	DUP	WG2647164-5						
Fluoride (F)		0.400	0.398		mg/L	0.5	20	24-OCT-17
WG2647164-2	LCS							
Fluoride (F)			99.1		%		90-110	24-OCT-17
WG2647164-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	24-OCT-17
WG2647164-4	MS	WG2647164-5						
Fluoride (F)			98.1		%		75-125	24-OCT-17
MET-T-CCMS-WP		Water						
Batch	R3867468							
WG2649075-4	DUP	WG2649075-3						
Aluminum (Al)-Total		0.0949	0.0987		mg/L	3.9	20	26-OCT-17
Antimony (Sb)-Total		0.00012	0.00011		mg/L	8.1	20	26-OCT-17



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Client: Town of The Pas - Water Plant
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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R3867468							
WG2649075-4	DUP	WG2649075-3						
Arsenic (As)-Total		0.00097	0.00098		mg/L	1.1	20	26-OCT-17
Barium (Ba)-Total		0.00769	0.00775		mg/L	0.7	20	26-OCT-17
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-OCT-17
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	26-OCT-17
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	26-OCT-17
Cadmium (Cd)-Total		0.0000061	0.0000053		mg/L	14	20	26-OCT-17
Calcium (Ca)-Total		11.5	11.6		mg/L	0.6	20	26-OCT-17
Cesium (Cs)-Total		0.000094	0.000093		mg/L	1.0	20	26-OCT-17
Chromium (Cr)-Total		0.00019	0.00019		mg/L	0.0	20	26-OCT-17
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-OCT-17
Copper (Cu)-Total		0.0665	0.0671		mg/L	0.9	20	26-OCT-17
Iron (Fe)-Total		1.76	1.77		mg/L	0.2	20	26-OCT-17
Lead (Pb)-Total		0.00144	0.00145		mg/L	0.3	20	26-OCT-17
Lithium (Li)-Total		0.0015	0.0015		mg/L	2.5	20	26-OCT-17
Magnesium (Mg)-Total		3.71	3.84		mg/L	3.6	20	26-OCT-17
Manganese (Mn)-Total		0.0115	0.0117		mg/L	1.7	20	26-OCT-17
Molybdenum (Mo)-Total		0.000134	0.000117		mg/L	14	20	26-OCT-17
Nickel (Ni)-Total		0.00081	0.00076		mg/L	6.1	20	26-OCT-17
Potassium (K)-Total		0.732	0.750		mg/L	2.5	20	26-OCT-17
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	26-OCT-17
Rubidium (Rb)-Total		0.00127	0.00130		mg/L	2.4	20	26-OCT-17
Selenium (Se)-Total		0.000101	0.000110		mg/L	8.5	20	26-OCT-17
Silicon (Si)-Total		1.68	1.68		mg/L	0.1	20	26-OCT-17
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-OCT-17
Sodium (Na)-Total		10.5	10.7		mg/L	1.9	20	26-OCT-17
Strontium (Sr)-Total		0.0222	0.0214		mg/L	3.4	20	26-OCT-17
Sulfur (S)-Total		0.98	1.04		mg/L	6.2	20	26-OCT-17
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	26-OCT-17
Thallium (Tl)-Total		0.000018	<0.000010	RPD-NA	mg/L	N/A	20	26-OCT-17
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-OCT-17
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-OCT-17
Titanium (Ti)-Total		0.00241	0.00238		mg/L	1.1	20	26-OCT-17
Tungsten (W)-Total		<0.00010	<0.00010		mg/L			26-OCT-17



Quality Control Report

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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R3867468							
WG2649075-4 DUP		WG2649075-3						
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-OCT-17
Uranium (U)-Total		0.000092	0.000098		mg/L	6.8	20	26-OCT-17
Vanadium (V)-Total		0.00064	0.00064		mg/L	0.2	20	26-OCT-17
Zinc (Zn)-Total		0.0067	0.0063		mg/L	4.9	20	26-OCT-17
Zirconium (Zr)-Total		0.000152	0.000142		mg/L	6.4	20	26-OCT-17
WG2649075-2 LCS								
Aluminum (Al)-Total			101.8		%		80-120	26-OCT-17
Antimony (Sb)-Total			100.3		%		80-120	26-OCT-17
Arsenic (As)-Total			102.8		%		80-120	26-OCT-17
Barium (Ba)-Total			99.8		%		80-120	26-OCT-17
Beryllium (Be)-Total			97.4		%		80-120	26-OCT-17
Bismuth (Bi)-Total			97.7		%		80-120	26-OCT-17
Boron (B)-Total			95.0		%		80-120	26-OCT-17
Cadmium (Cd)-Total			100.3		%		80-120	26-OCT-17
Calcium (Ca)-Total			101.0		%		80-120	26-OCT-17
Cesium (Cs)-Total			105.0		%		80-120	26-OCT-17
Chromium (Cr)-Total			101.9		%		80-120	26-OCT-17
Cobalt (Co)-Total			101.8		%		80-120	26-OCT-17
Copper (Cu)-Total			102.3		%		80-120	26-OCT-17
Iron (Fe)-Total			102.7		%		80-120	26-OCT-17
Lead (Pb)-Total			100.6		%		80-120	26-OCT-17
Lithium (Li)-Total			98.3		%		80-120	26-OCT-17
Magnesium (Mg)-Total			106.5		%		80-120	26-OCT-17
Manganese (Mn)-Total			103.2		%		80-120	26-OCT-17
Molybdenum (Mo)-Total			103.4		%		80-120	26-OCT-17
Nickel (Ni)-Total			102.2		%		80-120	26-OCT-17
Potassium (K)-Total			99.7		%		80-120	26-OCT-17
Phosphorus (P)-Total			104.6		%		80-120	26-OCT-17
Rubidium (Rb)-Total			101.6		%		80-120	26-OCT-17
Selenium (Se)-Total			100.8		%		80-120	26-OCT-17
Silicon (Si)-Total			103.4		%		80-120	26-OCT-17
Silver (Ag)-Total			101.2		%		80-120	26-OCT-17
Sodium (Na)-Total			103.3		%		80-120	26-OCT-17



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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R3867468							
WG2649075-2	LCS							
Strontium (Sr)-Total			101.7		%		80-120	26-OCT-17
Sulfur (S)-Total			98.0		%		80-120	26-OCT-17
Tellurium (Te)-Total			101.8		%		80-120	26-OCT-17
Thallium (Tl)-Total			99.5		%		80-120	26-OCT-17
Thorium (Th)-Total			100.2		%		80-120	26-OCT-17
Tin (Sn)-Total			101.7		%		80-120	26-OCT-17
Titanium (Ti)-Total			99.5		%		80-120	26-OCT-17
Tungsten (W)-Total			100.5		%		80-120	26-OCT-17
Uranium (U)-Total			104.7		%		80-120	26-OCT-17
Vanadium (V)-Total			103.3		%		80-120	26-OCT-17
Zinc (Zn)-Total			97.0		%		80-120	26-OCT-17
Zirconium (Zr)-Total			100.1		%		80-120	26-OCT-17
WG2649075-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	26-OCT-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	26-OCT-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	26-OCT-17
Boron (B)-Total			<0.010		mg/L		0.01	26-OCT-17
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	26-OCT-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	26-OCT-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	26-OCT-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	26-OCT-17
Iron (Fe)-Total			<0.010		mg/L		0.01	26-OCT-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	26-OCT-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	26-OCT-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	26-OCT-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	26-OCT-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	26-OCT-17
Potassium (K)-Total			<0.050		mg/L		0.05	26-OCT-17



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Client: Town of The Pas - Water Plant
 Town of The Pas Box 870
 The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R3867468							
WG2649075-1 MB								
Phosphorus (P)-Total			<0.050		mg/L		0.05	26-OCT-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	26-OCT-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	26-OCT-17
Silicon (Si)-Total			<0.10		mg/L		0.1	26-OCT-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	26-OCT-17
Sodium (Na)-Total			<0.050		mg/L		0.05	26-OCT-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	26-OCT-17
Sulfur (S)-Total			<0.50		mg/L		0.5	26-OCT-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	26-OCT-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	26-OCT-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	26-OCT-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	26-OCT-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	26-OCT-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	26-OCT-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	26-OCT-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	26-OCT-17
WG2649075-5 MS		WG2649075-3						
Aluminum (Al)-Total			105.4		%		70-130	26-OCT-17
Antimony (Sb)-Total			99.2		%		70-130	26-OCT-17
Arsenic (As)-Total			99.8		%		70-130	26-OCT-17
Barium (Ba)-Total			99.7		%		70-130	26-OCT-17
Beryllium (Be)-Total			97.8		%		70-130	26-OCT-17
Bismuth (Bi)-Total			95.6		%		70-130	26-OCT-17
Boron (B)-Total			95.1		%		70-130	26-OCT-17
Cadmium (Cd)-Total			97.8		%		70-130	26-OCT-17
Calcium (Ca)-Total			N/A	MS-B	%		-	26-OCT-17
Cesium (Cs)-Total			104.3		%		70-130	26-OCT-17
Chromium (Cr)-Total			99.5		%		70-130	26-OCT-17
Cobalt (Co)-Total			99.5		%		70-130	26-OCT-17
Copper (Cu)-Total			N/A	MS-B	%		-	26-OCT-17
Iron (Fe)-Total			97.9		%		70-130	26-OCT-17
Lead (Pb)-Total			96.4		%		70-130	26-OCT-17



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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R3867468							
WG2649075-5 MS		WG2649075-3						
Lithium (Li)-Total			100.4		%		70-130	26-OCT-17
Magnesium (Mg)-Total			N/A	MS-B	%		-	26-OCT-17
Manganese (Mn)-Total			97.8		%		70-130	26-OCT-17
Molybdenum (Mo)-Total			98.2		%		70-130	26-OCT-17
Nickel (Ni)-Total			98.9		%		70-130	26-OCT-17
Potassium (K)-Total			100.8		%		70-130	26-OCT-17
Phosphorus (P)-Total			97.7		%		70-130	26-OCT-17
Rubidium (Rb)-Total			99.6		%		70-130	26-OCT-17
Selenium (Se)-Total			101.1		%		70-130	26-OCT-17
Silicon (Si)-Total			92.6		%		70-130	26-OCT-17
Silver (Ag)-Total			98.9		%		70-130	26-OCT-17
Sodium (Na)-Total			N/A	MS-B	%		-	26-OCT-17
Strontium (Sr)-Total			N/A	MS-B	%		-	26-OCT-17
Sulfur (S)-Total			96.8		%		70-130	26-OCT-17
Tellurium (Te)-Total			96.2		%		70-130	26-OCT-17
Thallium (Tl)-Total			93.5		%		70-130	26-OCT-17
Thorium (Th)-Total			99.6		%		70-130	26-OCT-17
Tin (Sn)-Total			98.0		%		70-130	26-OCT-17
Titanium (Ti)-Total			98.1		%		70-130	26-OCT-17
Tungsten (W)-Total			100.5		%		70-130	26-OCT-17
Uranium (U)-Total			100.6		%		70-130	26-OCT-17
Vanadium (V)-Total			101.0		%		70-130	26-OCT-17
Zinc (Zn)-Total			89.9		%		70-130	26-OCT-17
Zirconium (Zr)-Total			98.6		%		70-130	26-OCT-17
NH3-COL-WP								
	Water							
Batch	R3867911							
WG2650150-11 DUP		L2012186-2						
Ammonia, Total (as N)		0.018	0.021		mg/L	18	20	26-OCT-17
WG2650150-10 LCS								
Ammonia, Total (as N)			102.2		%		85-115	26-OCT-17
WG2650150-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	26-OCT-17
WG2650150-12 MS		L2012186-2						
Ammonia, Total (as N)			98.5		%		75-125	26-OCT-17



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Client: Town of The Pas - Water Plant
 Town of The Pas Box 870
 The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-WP								
	Water							
Batch	R3867682							
WG2647164-3	DUP	WG2647164-5						
Nitrite (as N)		0.0052	0.0048		mg/L	8.3	20	24-OCT-17
WG2647164-2	LCS							
Nitrite (as N)			100.3		%		90-110	24-OCT-17
WG2647164-1	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	24-OCT-17
WG2647164-4	MS	WG2647164-5						
Nitrite (as N)			92.2		%		75-125	24-OCT-17
NO3-L-IC-N-WP								
	Water							
Batch	R3867682							
WG2647164-3	DUP	WG2647164-5						
Nitrate (as N)		0.0218	0.0220		mg/L	0.8	20	24-OCT-17
WG2647164-2	LCS							
Nitrate (as N)			100.7		%		90-110	24-OCT-17
WG2647164-1	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	24-OCT-17
WG2647164-4	MS	WG2647164-5						
Nitrate (as N)			92.9		%		75-125	24-OCT-17
PH-WP								
	Water							
Batch	R3866942							
WG2649014-5	DUP	L2012186-1						
pH		8.59	8.59	J	pH units	0.00	0.2	25-OCT-17
WG2649014-2	LCS							
pH			7.40		pH units		7.3-7.5	25-OCT-17
SO4-IC-N-WP								
	Water							
Batch	R3867682							
WG2647164-3	DUP	WG2647164-5						
Sulfate (SO4)		0.75	0.73		mg/L	2.7	20	24-OCT-17
WG2647164-2	LCS							
Sulfate (SO4)			100.6		%		90-110	24-OCT-17
WG2647164-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	24-OCT-17
WG2647164-4	MS	WG2647164-5						
Sulfate (SO4)			92.1		%		75-125	24-OCT-17
TDS-WP								
	Water							



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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8

Contact: RYAN LAGACE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TDS-WP								
	Water							
Batch	R3869354							
WG2650444-7	DUP	L2013006-1						
Total Dissolved Solids		932	910		mg/L	2.4	20	27-OCT-17
WG2650444-6	LCS							
Total Dissolved Solids			99.4		%		85-115	27-OCT-17
WG2650444-5	MB							
Total Dissolved Solids			<10		mg/L		10	27-OCT-17
TURBIDITY-WP								
	Water							
Batch	R3870469							
WG2650458-3	DUP	L2011753-6						
Turbidity		41.2	41.6		NTU	1.0	15	27-OCT-17
WG2650458-2	LCS							
Turbidity			99.0		%		85-115	27-OCT-17
WG2650458-1	MB							
Turbidity			<0.10		NTU		0.1	27-OCT-17
UV-%TRANS-WP								
	Water							
Batch	R3866510							
WG2649129-3	DUP	L2012199-2						
Transmittance, UV (254 nm)		87.5	87.7		%T/cm	0.2	20	26-OCT-17
WG2649129-1	IRM	BLANK						
Transmittance, UV (254 nm)			99.8		%		99.5-100.5	26-OCT-17
WG2649129-2	LCS							
Transmittance, UV (254 nm)			99.5		%		85-115	26-OCT-17

Quality Control Report

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Client: Town of The Pas - Water Plant
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The Pas MB R9A 1K8
Contact: RYAN LAGACE

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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

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Client: Town of The Pas - Water Plant
Town of The Pas Box 870
The Pas MB R9A 1K8
Contact: RYAN LAGACE

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity	1	23-OCT-17 14:00	27-OCT-17 11:04	3	4	days	EHT
	2	23-OCT-17 14:00	27-OCT-17 11:04	3	4	days	EHT
pH	1	23-OCT-17 14:00	25-OCT-17 12:00	0.25	46	hours	EHTR-FM
	2	23-OCT-17 14:00	25-OCT-17 12:00	0.25	46	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 L2012199 were received on 24-OCT-17 13:30.

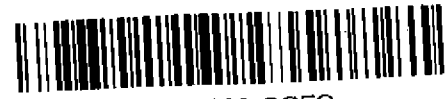
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

Chain of Custody (COC)
Manitoba Drinking Water Systems
ONLY FOR: Regulatory General Chemistry & VOC Samples



L2012199-COFC

Report to Operator (email pdf):				Owner billing (Email):				Regular Service (default):		Regular Service (is 5-7 Days):	
Contact:	Ryan Legacé			Contact:	Ryan Legacé			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:	67 Edwards Ave, The Pas, MB			Address:	Box 870, The Pas, MB, R9A 1K8						
Phone:	204-627-1142			Phone:	204-627-1142						
Email:	wtp@townofthepas.ca			Email:	wtp@townofthepas.ca						
Operator contact update (if different then above):				Owner contact update (if different then above):				Email pdf copy to:			
Contact:				Contact:				DWO:	Brian Lundmark		
Address:				Address:				DWO Address:	Box 28-59 Elizabeth Dr Thompson MB R8N 1X4		
Phone:				Phone:				DWO Phone:	204-677-6704		
Email:				Email:				DWO Email:	brian.lundmark@gov.mb.ca		
Account:		ODW Report type:	EMS (Lab-MWS)	Client / Project Information:				Analysis Request			
Agency Code:	382	Project:	DWQ-C	Operation Name:	The Pas PWS			MB-CH-PWS-V2013	MB-VOC-PWS-V2013	Number of Containers	
Lab:		Lab Work Order # / Job # (lab use only)		Operation Code (com code):	226.00						
				Operation Id:	11490						
				Sampled by:							
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				
	1710BL2261	MB05KLD071	1-Raw	23 Oct 2017	07:00	6	1	X			
	1710BL2262	MB05KLD072	2-Treated			10	1	X			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.								Sample Matrix:		Sample Type:	
								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:		Received By: (lab use only)	APL	Date & Time: (lab use only)	24/10/17	Sample Condition (lab use only)			
								Temperature	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)	1:30	11.6			

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.