Rm of Whitemouth

Whitemouth
RIVER VALLEY

Public Water System

Annual Report

2019

Name of the Public Water System: **Whitemouth Rural Pipeline**

Name of the Legal Owner: **Rural Municipality of Whitemouth**

Contact Person: **Colleen Johnson, Chief Administrative Officer**

Phone: **(204) 348-2221**

Fax: **(204) 348-2576**

Email: **cao@rmwhitemouth.com**

Website: **www.rmwhitemouth.com**

Name of Operators: **Glen Campbell, Sr. Utility Operator – Water Treatment 2**

Water Distribution 1

Waste Water Small System

Sean Fawley, Operator - Water Treatment 1 OIT

Water Distribution 1 OIT

Waste Water Small

System OIT

Phone during business hours: **(204) 348-2574 or (204) 348-2221**

Date prepared: March 24, 2020

Prepared By: Glen Campbell

Colleen Johnson CAO

Rm of Whitemouth

Table of Contents

Introduction:

The 2019 Public Water System Annual Report summarizes the ability of the RM of Whitemouth to produce and provide safe potable water to our constituents which meets provincial regulations.

1. Description of the Water System:

The RM of Whitemouth Public Water System provides potable drinking water to a population of approximately 1000 residents. Treated water from the water treatment plant meets all health as stated in the *Guidelines for Canadian Drinking Water Quality* as well as provincial regulations. Aesthetic objectives in the *Guidelines for Canadian Drinking Water Quality* met all.

1.1 Water Supply Source

The RM of Whitemouth Water Treatment Plant draws its supply water from Natalie Lake of the Winnipeg River. The Winnipeg River has an abundant supply of high-quality water which is easily treated to meet all standards.

The Water Treatment Plant intake is approximately 12 feet below the surface of the river. The water is then pumped into the Water Treatment Plant situated in Seven Sisters Falls, Mb on Waterline Road.

1.2 Water Treatment Processes

The high quality of water which comes out of the Winnipeg River requires a minimal amount of treatment to meet all provincial requirements. Upon entering the water treatment plant and entering our Actiflo treatment system the raw water is injected with a product called Hydrex 3613 Polymere, which is a flocculating agent, an Aluminum Sulphate Solution, which is a further flocculating agent, and Actisand, which is fine silica sand. These processes are geared mainly towards treating the turbidity and colour of the raw water. The raw water comes out of the Winnipeg River with an average turbidity between 3-10 nephelometric turbidity units (NTU). The Actiflo processes drop this figure to on average between 0.5 -0.7 NTU. The water which has been treated through the Actiflo. After going through the filter, the treated water is at approximately 0.030-0.050 NTU. This number is approximately 11% of our regulated limit. The legal requirement for our treated water is 0.3 NTU after these filters. The water is then stored in a 873,000 litre reservoir.

A result of the Actiflo/ Chemical processes is that the water pH drops to approximately 6.3-6.5. This water is then treated with Sodium Hydroxide 25% solution to raise the pH from 6.3-6.5 to a level of 7.6-7.8. This means that the treated water is very close to neutral which aids in controlling corrosion and deposits. The reservoir water is further treated with Sodium Hyprochlorite 12% as a disinfecting agent. Our distribution water must leave the water treatment plant with a minimum of 0.5mg per litre of free chlorine residual and have a minimum of 0.1 mg per litre in all areas of the distribution.

1.3 Water Treatment and Distribution Capacities

The RM of Whitemouth Water Treatment Plant operates at an incoming rate of 15 litres per second and runs for approximately 8 hours per day using two 20hp distribution duty pumps. We treat approximately 500000 litres daily on average. Distribution system pressure is maintained at between 50-57psi using frequency drive pumps and a pressure relief system.

1.4 Distribution System

RM of Whitemouth's water distribution system is approximately 80 kilometres long and is comprised of approximately 50% PVC and 50% HDPE. Distribution piping varies in size from 8" to 2".

1.5 Number of Connections, and water user types

RM of Whitemouth has approximately 500 connections with a large different type of users from residential, commercial, and farms. From small users to large users. From year round to seasonal connections. In 2019 the RM of Whitemouth started selling water to the RM of Lac Du Bonnet which added another 100 connections

1.6 System Classification and Certification under the Water and Wastewater Facility Operators Regulation under the Environment Act.

A Class 2 Water Treatment Facility

A Class 1 Water Distribution System

2. Disinfection System in Use.

The RM of Whitemouth uses Sodium Hypochlorite 12% as our disinfection method. Disinfection is the selective destruction or inactivation of potential disease-causing organisms in water. As per the *Drinking Water Safety Act* the RM of Whitemouth Public Water System must ensure that we maintain a free disinfectant residual of at least:

- 0.5 mg of free chlorine per litre of water is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes
- O.1 mg of free chlorine per litre of water is detectable at all times at any point in the distribution network.

2.1 Type of Disinfection System Used

The RM of Whitemouth Water Treatment Plant disinfects using Sodium Hypochlorite 12% concentration. Chlorine is added to the system using 2 peristaltic pumps, one as primary one as backup should one fail or fault the other will automatically switch.

2.2 Need for Redundancy and Monitoring

The "Drinking Water and Safety Act" requires that disinfection is continuously maintained. To ensure this we use two separate chlorine pumps allowing for redundancy in the system itself where one side can be turned off and the disinfecting needs will be met by the remaining side and some spare parts which are more prone to fail or need replacing.

Disinfectant total and free residuals are checked and recorded daily at the water treatment plant and bi-weekly at points throughout the distribution system. Results are recorded on the appropriate monitoring forms and are sent to the regional Drinking Water Officer at the end of each month. SCADA system that records free chlorine levels on a continuous basis.

2.3 Disinfectant Residual Overall Performance and Results

For the year 2019 the RM of Whitemouth Public Water System has met 100% of the regulatory requirements for treated water and 100% for distributed water.

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the *Guidelines for Canadian Drinking Water Quality,* developed by Health Canada. The parameters are health-based and they express the maximum acceptable concentrations for drinking water. Concentration values in excess of the standards constitute a possible health related issue and require corrective actions. The 2019 results for the RM of Whitemouth Public Water System are summarized in the following tables:

3.1 Disinfection Monitoring and Reporting

	Regulatory Requirement	Water System Performance
Free Chlorine Residual entering the Distribution System	≥0.5 mg/L	Meets requirements
Frequency of Testing	Daily	Meets requirements
Free Chlorine Residual in the Distribution System	≥0.1 mg/L	Meets requirements
Frequency of Testing	Bi-Weekly	Meets requirements
Report Submissions	Monthly	Meets requirements

3.2 Bacteriological Monitoring and Reporting

	Regulatory Requirement	Water System Performance
Number of Raw/Incoming Water Samples	Bi-weekly	Met requirements
Number of Treated Water Samples	Bi-weekly	Met requirements
Number of Distribution Water Samples	52	Met requirements
Frequency of Testing	Bi-weekly	Met requirements
Total Coliform (TC) Present in Water Samples	0 TC per 100mL	Met requirements
E. Coli (EC) Present in Water Samples	0 EC per 100mL	Met requirements

3.3 Turbidity Monitoring and Reporting

	Regulatory Requirement	Water System Performance
Chemically assisted, rapid gravity filtration process	≤0.3NTU in at Least 95% Of samples	Meets requirements
Standard	Never to exceed 1.0 NTU	Meets requirements
Frequency of Testing	Continuous	Meets requirements
Report Submissions	Monthly	Few adjustments needed to reporting software

3.4 Disinfection By-products Monitoring and Reporting

	Regulatory Requirement	Water System Performance
Trihalomethane sampling requirements	Quarterly	Testing required every 2nd year completed 2019
Total Trihalomethane Standard	0.1mg/L	Passed 0.0811
Haoacetic Acid sampling requirements	Quarterly	Testing required every 2nd year completed 2019
Haloacetic Acid Standard	0.08mg/L	Passed 0.0626

4. Water System Alterations, Incidents and Corrective Actions

4.1 Water Breaks

All waterline repairs were done while the waterline was still under minimal positive pressure to ensure no in line contamination. After repairs were completed waterlines were flushed and checked to make sure that a satisfactory disinfectant residual was maintained prior to being put back into service. All repairs were done in such a way as to minimize down time for users and as much advance notice given as possible. The RM of Whitemouth had less than 4 repairs in 2019.

4.2 Water Hook-Ups

During 2019 the RM had 4 water hookup and one of the is to the RM of Lac Du Bonnet which has about 100 connections also a new booster was added for Lac Du Bonnet on Brookfield Rd. where the RM of Lac Du Bonnet is responsible for. This booster was added so Lac Du Bonnet has sufficient pressure and chlorine at the end of there line.

4.3 Other Incidents or Corrective Actions

Microbial requirements are not met due to our recording software for 3-log barrier needing a little bit of programing changes. We got this recording software in March 2018 and were only now notified that it needs these small changes.

5. Drinking Water Safety Orders on Water System and Corrective Actions Taken

During 2019, there were no Drinking Water Safety Orders issued for the RM of Whitemouth Public Water System.

6. Boil Water Advisories Issued on Water System and Corrective Actions Taken

During 2019 the RM of Whitemouth Public Water System did not have any boil water advisories issued.

7. Warnings Issued or Charges Laid on Water System in Accordance with The Drinking Water Safety Act

During 2019 the RM of Whitemouth Public Water System did not have any warnings or charges.

8. Major Expenses Incurred in 2019

In 2019 the RM of Whitemouth bought a new meter reading equipment and software for billing. The Rm also purchased new leak detection equipment. Water rates increased due to the increase cost of chemical, transportation, and other supplies and the utility has been running a deficit the last few years.

9. Anticipated Future Major Cost Items, System Expansion and/or Increased Production

There is no major cost items, expansion, or production to report

Manitoba
Conservation and Climate
Office of Drinking Water
Unit B – 284 Reimer Avenue
Steinbach, Manitoba, R5G 0R5
T 204-371-3885 **F** 204-326-2472

February 27, 2020

Colleen Johnson
RM of Whitemouth
Box 248, 49 Railway Ave.
Whitemouth, MB, R0E 2G0
cao@rmwhitemouth.com

2019 Annual Compliance Audit

Dear Ms. Johnson:

Please find enclosed the 2019 Annual Compliance Audit for the Whitemouth public water system (PWS). The report compares water system compliance to The Drinking Water Safety Act and its supporting regulations, and the terms and conditions of the water system's current operating licence (PWS-08-127-02).

Where non-compliance items are identified, the issues do not necessarily translate into increased public health risk. The Office of Drinking Water uses processes, including boil water advisories, to notify water users of a public health risk.

Please review the following terms and conditions of your operating licence to ensure ongoing compliance:

- Water quality sampling frequencies identified in *Table 2.*
- Water System Assessment (due date: March 1, 2025)
- 2019 Public Water System Annual Report (due date: March 31, 2020)
- Advisory Notification Plan (due date: May 1, 2020)

Facility Classification and Operator Certification

In 2020, Conservation and Climate will be enforcing on the Water and Wastewater Facility Operators Regulation MR. 77/2003 beginning with Public Water Systems classified at Level 3 and Level 4 Water Treatment Facilities and Water Distribution. The focus will be on operator certification and submission of an up-to-date Table of Organization.

Operational Guidelines

Water suppliers are reminded to immediately notify the Office of Drinking Water of any condition(s) that may affect the ability of the water system to produce or deliver safe drinking water. These conditions include:

- treatment upsets, bypass conditions, operation outside of licence conditions
- contamination of source or treated water
- a disinfection, filtration, or distribution system failure

Operational Guidelines to assist operators in meeting regulatory obligations for monitoring and reporting under The Drinking Water Safety Act, including Seasonal System and Emergency Reporting requirements, can be found on our website at: www.gov.mb.ca/drinkingwater.

Additional Information

Health Canada has updated National Guidelines, including algae (cyanobacteria toxins) manganese and lead. Owners and operators are encouraged to review Health Canada's guidelines and related chemistry results to determine what impact they may have on your water supply. You will receive notification of any changes to Health Canada's Guidelines for Canadian Drinking Water Quality and Manitoba Standards should they affect your water supply.

The 2019 Annual Compliance Audit is based on information submitted to this office. If you have questions regarding non-compliance items identified in this audit, please review your records prior to contacting this office. If your records conflict with the audit information, please call me at (204) 371-3885.

Sincerely,

Shannon Ganter
Regional Drinking Water Officer

Enclosures

copy: Glen Campbell, Sr. Utility Operator
Sean Fawley, Operator
Lacey Smith, Operator

Manitoba

2019 Annual Compliance Audit

Water System: WHITEMOUTH - PWS

Code: 249.25

Water System Owner: Rural Municipality of Whitemouth

Water System Operating Licence: PWS-08-127-02 Expiry Date: November 30, 2022

1) This report documents the Whitemouth Public Water System compliance for the period from January 1 to December 31, 2019.

2) Addendum A to this report provides specific information on the non-compliance incidents identified in the summary below.

3) Other than the information provided in attached Addendum A, the water supplier has complied with The Drinking Water Safety Act, its supporting regulations, and the terms and conditions of the water system's current operating licence

4) This report is based on information submitted by the water supplier, agents of the water supplier, and / or the Province of Manitoba.

Summary of Non-Compliance Incidents:

• Failure to Meet Microbial Requirements
• Failure to Meet Operational Requirements

Manitoba

Addendum A: Record of Non-Compliance
Water System: WHITEMOUTH - PWS
Report period: January 1, 2019 to December 31, 2019.

Disinfection Requirements

Date	Incident	Outcome
	None reported	

Bacteriological Requirements

Date	Incident	Outcome
	None reported	

Microbial Requirements

	Incident	Outcome
2019	Failure to meet the 3-log protozoa barrier	Non-compliant

Turbidity Requirements

Date	Incident	Outcome
	None reported	

Chemical Requirements

Date	Incident	Outcome
	None reported	

Operational Requirements

Date	Incident	Outcome
2019	Failure to submit a Advisory Notification on Plan	Non-compliant

RM of Whitemouth Rural Pipeline

ATTN: GLEN CAMPBELL

Whitemouth Rural Pipeline
Box 249

Whitemouth MB R0E 2G0

Date Received: 06- NOV-19

Report Date: 25- NOV- 19 16:07 (MT)
Version: FINAL

Client Phone: 204- 348- 2574

Certificate of Analysis

Lab Work Order #: L2378268

Project P.O. #:	CONTRACT 5700- 2018/19
Job Reference:	WHITEMOUTH - PWS 249.25
C of C Numbers:	
Legal Site Desc:	7238

Connor Cattani
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2378268-6 WHITEMOUTH 1 - RAW							
Sampled By: GC on 06-NOV-19 @ 09:00							
Matrix: DRINKING WATER - RAW							
MB Chemistry for PWS							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	56.0		1.2	mg/L		07-NOV-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	45.9		1.0	mg/L		06-NOV-19	R4901790
Ammonia by colour							
Ammonia, Total (as N)	0.014		0.010	mg/L		07-NOV-19	R4905084
Bromide in Water by IC (Low Level)							
Bromide (Br)	<0.010		0.010	mg/L		07-NOV-19	R4902964
Chloride in Water by IC (Low Level)							
Chloride (Cl)	1.90		0.10	mg/L		07-NOV-19	R4902964
Colour, True							
Colour, True	29.3		5.0	CU		07-NOV-19	R4902828
Conductivity							
Conductivity	91.5		1.0	umhos/cm		06-NOV-19	R4901790
Dissolved Organic Carbon by Combustion							
Dissolved Organic Carbon	9.43		0.50	mg/L		06-NOV-19	R4901949
Fluoride in Water by IC							
Fluoride (F)	0.048		0.020	mg/L		07-NOV-19	R4902964
Hardness Calculated							
Hardness (as CaCO3)	47.0	HTC	0.20	mg/L		23-NOV-19	
Langelier Index 4C							
Langelier Index (4 C)	-0.98					23-NOV-19	
Langelier Index 60C							
Langelier Index (60 C)	-0.20					23-NOV-19	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0765		0.0050	mg/L		07-NOV-19	R4902964
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		07-NOV-19	R4902964
Sulfate in Water by IC							
Sulfate (SO4)	2.87		0.30	mg/L		07-NOV-19	R4902964
Total Dissolved Solids (TDS)							
Total Dissolved Solids	66		13	mg/L		08-NOV-19	R4904965
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.218		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Arsenic (As)-Total	0.00107		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Barium (Ba)-Total	0.0103		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Boron (B)-Total	<0.010		0.010	mg/L	09-NOV-19	21-NOV-19	R4921452
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-NOV-19	18-NOV-19	R4916027
Calcium (Ca)-Total	12.1		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Cesium (Cs)-Total	0.000027		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Chromium (Cr)-Total	0.00056		0.00010	mg/L	09-NOV-19	18-NOV-19	R4916027
Cobalt (Co)-Total	0.00011		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Copper (Cu)-Total	0.00136		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Iron (Fe)-Total	0.250		0.010	mg/L	09-NOV-19	12-NOV-19	R4906529
Lead (Pb)-Total	0.000147		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2378268-6 WHITEMOUTH 1 - RAW							
Sampled By: GC on 06-NOV-19 @ 09:00							
Matrix: DRINKING WATER - RAW							
Total Metals in Water by CRC ICPMS							
Lithium (Li)-Total	0.0016		0.0010	mg/L	09-NOV-19	12-NOV-19	R4906529
Magnesium (Mg)-Total	4.06		0.0050	mg/L	09-NOV-19	12-NOV-19	R4906529
Manganese (Mn)-Total	0.0155		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Molybdenum (Mo)-Total	0.000154		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Nickel (Ni)-Total	0.00086		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Potassium (K)-Total	0.851		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Rubidium (Rb)-Total	0.00182		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Selenium (Se)-Total	0.000122		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Silicon (Si)-Total	2.20		0.10	mg/L	09-NOV-19	12-NOV-19	R4906529
Silver (Ag)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Sodium (Na)-Total	2.64		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Strontium (Sr)-Total	0.0248		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Titanium (Ti)-Total	0.00672		0.00030	mg/L	09-NOV-19	12-NOV-19	R4906529
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Uranium (U)-Total	0.000107		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Vanadium (V)-Total	0.00132		0.00050	mg/L	09-NOV-19	18-NOV-19	R4916027
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Total Organic Carbon by Combustion							
Total Organic Carbon	10.2		0.50	mg/L		08-NOV-19	R4904758
Turbidity							
Turbidity	5.27		0.10	NTU		06-NOV-19	R4901646
UV Transmittance (Calculated)							
Transmittance, UV (254 nm)	49.1		1.0	%T/cm		07-NOV-19	R4902145
pH							
pH	7.85		0.10	pH units		06-NOV-19	R4901790
L2378268-7 WHITEMOUTH 2 - TREATED							
Sampled By: GC on 06-NOV-19 @ 09:30							
Matrix: DRINKING WATER - TREATED							
MB Chemistry for PWS							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	47.3		1.2	mg/L		07-NOV-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	38.8		1.0	mg/L		06-NOV-19	R4901790
Ammonia by colour							
Ammonia, Total (as N)	0.022		0.010	mg/L		07-NOV-19	R4905084
Bromide in Water by IC (Low Level)							
Bromide (Br)	<0.010		0.010	mg/L		07-NOV-19	R4902964
Chloride in Water by IC (Low Level)							
Chloride (Cl)	4.54		0.10	mg/L		07-NOV-19	R4902964
Colour, True							
Colour, True	<5.0		5.0	CU		07-NOV-19	R4902828

ALS ENVIRONMENTAL ANALYTICAL REPORT

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2378268-7 WHITEMOUTH 2 - TREATED							
Sampled By: GC on 06-NOV-19 @ 09:30							
Matrix: DRINKING WATER - TREATED							
Conductivity							
Conductivity	160		1.0	umhos/cm		06-NOV-19	R4901790
Dissolved Organic Carbon by Combustion							
Dissolved Organic Carbon	4.04		0.50	mg/L		06-NOV-19	R4901949
Fluoride in Water by IC							
Fluoride (F)	0.025		0.020	mg/L		07-NOV-19	R4902964
Hardness Calculated							
Hardness (as CaCO3)	46.0	HTC	0.20	mg/L		23-NOV-19	
Langelier Index 4C							
Langelier Index (4 C)	-1.2					23-NOV-19	
Langelier Index 60C							
Langelier Index (60 C)	-0.39					23-NOV-19	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0786		0.0050	mg/L		07-NOV-19	R4902964
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		07-NOV-19	R4902964
Sulfate in Water by IC							
Sulfate (SO4)	34.5		0.30	mg/L		07-NOV-19	R4902964
Total Dissolved Solids (TDS)							
Total Dissolved Solids	97		13	mg/L		08-NOV-19	R4904965
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.125		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Arsenic (As)-Total	0.00035		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Barium (Ba)-Total	0.00826		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Boron (B)-Total	<0.010		0.010	mg/L	09-NOV-19	21-NOV-19	R4921452
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-NOV-19	18-NOV-19	R4916027
Calcium (Ca)-Total	12.0		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Chromium (Cr)-Total	0.00018		0.00010	mg/L	09-NOV-19	18-NOV-19	R4916027
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Copper (Cu)-Total	0.00059		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Iron (Fe)-Total	<0.010		0.010	mg/L	09-NOV-19	12-NOV-19	R4906529
Lead (Pb)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Lithium (Li)-Total	0.0015		0.0010	mg/L	09-NOV-19	12-NOV-19	R4906529
Magnesium (Mg)-Total	3.91		0.0050	mg/L	09-NOV-19	12-NOV-19	R4906529
Manganese (Mn)-Total	0.00068		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Molybdenum (Mo)-Total	0.000137		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Nickel (Ni)-Total	0.00091		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Potassium (K)-Total	0.797		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Rubidium (Rb)-Total	0.00134		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Selenium (Se)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Silicon (Si)-Total	1.53		0.10	mg/L	09-NOV-19	12-NOV-19	R4906529
Silver (Ag)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Sodium (Na)-Total	15.3		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Strontium (Sr)-Total	0.0251		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2378268-7 WHITEMOUTH 2 - TREATED							
Sampled By: GC on 06-NOV-19 @ 09:30							
Matrix: DRINKING WATER - TREATED							
Total Metals in Water by CRC ICPMS							
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-NOV-19	12-NOV-19	R4906529
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Uranium (U)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Vanadium (V)-Total	0.00063		0.00050	mg/L	09-NOV-19	18-NOV-19	R4916027
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Total Organic Carbon by Combustion							
Total Organic Carbon	3.84		0.50	mg/L		08-NOV-19	R4904758
Turbidity							
Turbidity	<0.10		0.10	NTU		06-NOV-19	R4901646
UV Transmittance (Calculated)							
Transmittance, UV (254 nm)	87.5		1.0	%T/cm		07-NOV-19	R4902145
pH							
pH	7.76		0.10	pH units		06-NOV-19	R4901790
L2378268-8 WHITEMOUTH 3 - DISTRIBUTION @							
Sampled By: GC on 06-NOV-19 @ 10:30							
Matrix: DRINKING WATER - DISTRIBUTION							
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.111		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Arsenic (As)-Total	0.00039		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Barium (Ba)-Total	0.00819		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Boron (B)-Total	<0.010		0.010	mg/L	09-NOV-19	21-NOV-19	R4921452
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-NOV-19	18-NOV-19	R4916027
Calcium (Ca)-Total	12.2		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Chromium (Cr)-Total	0.00015		0.00010	mg/L	09-NOV-19	18-NOV-19	R4916027
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Copper (Cu)-Total	0.00060		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Iron (Fe)-Total	<0.010		0.010	mg/L	09-NOV-19	12-NOV-19	R4906529
Lead (Pb)-Total	<0.000050		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Lithium (Li)-Total	0.0014		0.0010	mg/L	09-NOV-19	12-NOV-19	R4906529
Magnesium (Mg)-Total	4.16		0.0050	mg/L	09-NOV-19	12-NOV-19	R4906529
Manganese (Mn)-Total	0.00048		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Molybdenum (Mo)-Total	0.000142		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Nickel (Ni)-Total	0.00085		0.00050	mg/L	09-NOV-19	12-NOV-19	R4906529
Potassium (K)-Total	0.823		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Phosphorus (P)-Total	<0.030		0.030	mg/L	09-NOV-19	12-NOV-19	R4906529
Rubidium (Rb)-Total	0.00138		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Selenium (Se)-Total	0.000057		0.000050	mg/L	09-NOV-19	12-NOV-19	R4906529
Silicon (Si)-Total	1.52		0.10	mg/L	09-NOV-19	12-NOV-19	R4906529
Silver (Ag)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Sodium (Na)-Total	15.7		0.050	mg/L	09-NOV-19	12-NOV-19	R4906529
Strontium (Sr)-Total	0.0250		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Sulfur (S)-Total	12.2		0.50	mg/L	09-NOV-19	12-NOV-19	R4906529
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2378268-8 WHITEMOUTH 3 - DISTRIBUTION @							
Sampled By: GC on 06-NOV-19 @ 10:30							
Matrix: DRINKING WATER - DISTRIBUTION							
Total Metals in Water by CRC ICPMS							
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Tin (Sn)-Total	0.00014		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-NOV-19	12-NOV-19	R4906529
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-NOV-19	12-NOV-19	R4906529
Uranium (U)-Total	<0.000010		0.000010	mg/L	09-NOV-19	12-NOV-19	R4906529
Vanadium (V)-Total	0.00062		0.00050	mg/L	09-NOV-19	18-NOV-19	R4916027
Zinc (Zn)-Total	0.0048		0.0030	mg/L	09-NOV-19	12-NOV-19	R4906529
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-NOV-19	12-NOV-19	R4906529

ALS ENVIRONMENTAL ANALYTICAL REPORT

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
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.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.

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.

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

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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.

ALS Environmental

Quality Control Report

Workorder: L2378268 Report Date: 25-NOV-19 Page 1 of 9

Client: RM of Whitemouth Rural Pipeline
Whitemouth Rural Pipeline Box 249
Whitemouth MB R0E 2G0

Contact: GLEN CAMPBELL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R4901790								
WG3213017-19 LCS								
Alkalinity, Total (as CaCO3)			100.8		%		85-115	06-NOV-19
WG3213017-16 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	06-NOV-19
BR-L-IC-N-WP	**Water**							
Batch R4902964								
WG3213566-3 DUP		**L2378268-6**						
Bromide (Br)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	07-NOV-19
WG3213566-7 DUP		**L2378268-7**						
Bromide (Br)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	07-NOV-19
WG3213566-2 LCS								
Bromide (Br)			98.5		%		85-115	07-NOV-19
WG3213566-6 LCS								
Bromide (Br)			103.7		%		85-115	07-NOV-19
WG3213566-1 MB								
Bromide (Br)			<0.010		mg/L		0.01	07-NOV-19
WG3213566-5 MB								
Bromide (Br)			<0.010		mg/L		0.01	07-NOV-19
WG3213566-4 MS		**L2378268-6**						
Bromide (Br)			109.0		%		75-125	07-NOV-19
WG3213566-8 MS		**L2378268-7**						
Bromide (Br)			97.1		%		75-125	07-NOV-19
C-DOC-HTC-WP	**Water**							
Batch R4901949								
WG3213071-6 LCS								
Dissolved Organic Carbon			93.8		%		80-120	06-NOV-19
WG3213071-5 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	06-NOV-19
C-TOC-HTC-WP	**Water**							
Batch R4904758								
WG3216368-3 DUP		**L2378268-6**						
Total Organic Carbon		10.2	9.75		mg/L	4.0	20	08-NOV-19
WG3216368-2 LCS								
Total Organic Carbon			102.9		%		80-120	08-NOV-19
WG3216368-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	08-NOV-19
WG3216368-4 MS		**L2378268-7**						
Total Organic Carbon			102.0		%		70-130	08-NOV-19

ALS Environmental

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP	Water							
Batch R4902964								
WG3213566-3 DUP		L2378268-6						
Chloride (Cl)		1.90	1.91		mg/L	0.4	20	07-NOV-19
WG3213566-7 DUP		L2378268-7						
Chloride (Cl)		4.54	4.63		mg/L	2.1	20	07-NOV-19
WG3213566-2 LCS								
Chloride (Cl)			99.3		%		90-11(	07-NOV-19
WG3213566-6 LCS								
Chloride (Cl)			99.2		%		90-11(	07-NOV-19
WG3213566-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	07-NOV-19
WG3213566-5 MB								
Chloride (Cl)			<0.10		mg/L		0.1	07-NOV-19
WG3213566-4 MS		L2378268-6						
Chloride (Cl)			107.9		%		75-12[	07-NOV-19
WG3213566-8 MS		L2378268-7						
Chloride (Cl)			106.0		%		75-12[	07-NOV-19
COLOUR-TRUE-WP	Water							
Batch R4902828								
WG3214103-2 LCS								
Colour, True			97.9		%		85-11[	07-NOV-19
WG3214103-1 MB								
Colour, True			<5.0		CU		5	07-NOV-19
EC-WP	Water							
Batch R4901790								
WG3213017-18 LCS								
Conductivity			96.7		%		90-11(	06-NOV-19
WG3213017-16 MB								
Conductivity			<1.0		umhos/cm		1	06-NOV-19
F-IC-N-WP	Water							
Batch R4902964								
WG3213566-3 DUP		L2378268-6						
Fluoride (F)		0.048	0.048		mg/L	0.4	20	07-NOV-19
WG3213566-7 DUP		L2378268-7						
Fluoride (F)		0.025	0.025		mg/L	0.9	20	07-NOV-19
WG3213566-2 LCS								
Fluoride (F)			101.4		%		90-11(	07-NOV-19
WG3213566-6 LCS								
Fluoride (F)			100.9		%		90-11(	07-NOV-19

ALS Environmental

Quality Control Report

Workorder: L2378268 Report Date: 25-NOV-19

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WP	**Water**							
Batch R4902964								
WG3213566-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	07-NOV-19
WG3213566-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	07-NOV-19
WG3213566-4 MS		**L2378268-6**						
Fluoride (F)			113.0		%		75-12[illegible]	07-NOV-19
WG3213566-8 MS		**L2378268-7**						
Fluoride (F)			109.8		%		75-12[illegible]	07-NOV-19
MET-T-CCMS-WP	**Water**							
Batch R4906529								
WG3216276-2 LCS								
Aluminum (Al)-Total			103.8		%		80-12[illegible]	12-NOV-19
Antimony (Sb)-Total			105.0		%		80-12[illegible]	12-NOV-19
Arsenic (As)-Total			101.9		%		80-12[illegible]	12-NOV-19
Barium (Ba)-Total			101.9		%		80-12[illegible]	12-NOV-19
Beryllium (Be)-Total			99.0		%		80-12[illegible]	12-NOV-19
Bismuth (Bi)-Total			101.7		%		80-12[illegible]	12-NOV-19
Calcium (Ca)-Total			100.4		%		80-12[illegible]	12-NOV-19
Cesium (Cs)-Total			102.9		%		80-12[illegible]	12-NOV-19
Cobalt (Co)-Total			103.1		%		80-12[illegible]	12-NOV-19
Copper (Cu)-Total			102.1		%		80-12[illegible]	12-NOV-19
Iron (Fe)-Total			94.1		%		80-12[illegible]	12-NOV-19
Lead (Pb)-Total			100.6		%		80-12[illegible]	12-NOV-19
Lithium (Li)-Total			100.3		%		80-12[illegible]	12-NOV-19
Magnesium (Mg)-Total			108.2		%		80-12[illegible]	12-NOV-19
Manganese (Mn)-Total			100.2		%		80-12[illegible]	12-NOV-19
Molybdenum (Mo)-Total			105.4		%		80-12[illegible]	12-NOV-19
Nickel (Ni)-Total			100.3		%		80-12[illegible]	12-NOV-19
Potassium (K)-Total			100.5		%		80-12[illegible]	12-NOV-19
Phosphorus (P)-Total			103.6		%		80-12[illegible]	12-NOV-19
Rubidium (Rb)-Total			98.5		%		80-12[illegible]	12-NOV-19
Selenium (Se)-Total			100.3		%		80-12[illegible]	12-NOV-19
Silicon (Si)-Total			97.6		%		80-12[illegible]	12-NOV-19
Silver (Ag)-Total			98.6		%		80-12[illegible]	12-NOV-19
Sodium (Na)-Total			104.2		%		80-12[illegible]	12-NOV-19
Strontium (Sr)-Total			101.7		%		80-12[illegible]	12-NOV-19

ALS Environmental

Quality Control Report

Workorder: L2378268 Report Date: 25-NOV-19

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4906529								
WG3216276-2 LCS								
Sulfur (S)-Total			93.1		%		80-120	12-NOV-19
Tellurium (Te)-Total			102.1		%		80-120	12-NOV-19
Thallium (Tl)-Total			99.4		%		80-120	12-NOV-19
Thorium (Th)-Total			100.4		%		80-120	12-NOV-19
Tin (Sn)-Total			101.8		%		80-120	12-NOV-19
Titanium (Ti)-Total			101.3		%		80-120	12-NOV-19
Tungsten (W)-Total			103.1		%		80-120	12-NOV-19
Uranium (U)-Total			100.7		%		80-120	12-NOV-19
Zinc (Zn)-Total			104.4		%		80-120	12-NOV-19
Zirconium (Zr)-Total			98.6		%		80-120	12-NOV-19
WG3216276-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	12-NOV-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	12-NOV-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	12-NOV-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	12-NOV-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	12-NOV-19
Iron (Fe)-Total			<0.010		mg/L		0.01	12-NOV-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	12-NOV-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	12-NOV-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	12-NOV-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	12-NOV-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	12-NOV-19
Potassium (K)-Total			<0.050		mg/L		0.05	12-NOV-19
Phosphorus (P)-Total			<0.030		mg/L		0.03	12-NOV-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	12-NOV-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	12-NOV-19
Silicon (Si)-Total			<0.10		mg/L		0.1	12-NOV-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	12-NOV-19

ALS Environmental

Quality Control Report

Workorder: L2378268 Report Date: 25-NOV-19

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4906529								
WG3216276-1 MB								
Sodium (Na)-Total			<0.050		mg/L		0.05	12-NOV-19
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	12-NOV-19
Sulfur (S)-Total			<0.50		mg/L		0.5	12-NOV-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	12-NOV-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	12-NOV-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	12-NOV-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	12-NOV-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	12-NOV-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	12-NOV-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	12-NOV-19
NH3-COL-WP	**Water**							
Batch R4905084								
WG3216767-2 LCS								
Ammonia, Total (as N)			100.6		%		85-115	07-NOV-19
WG3216767-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	07-NOV-19
NO2-L-IC-N-WP	**Water**							
Batch R4902964								
WG3213566-3 DUP		**L2378268-6**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	07-NOV-19
WG3213566-7 DUP		**L2378268-7**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	07-NOV-19
WG3213566-2 LCS								
Nitrite (as N)			100.6		%		90-110	07-NOV-19
WG3213566-6 LCS								
Nitrite (as N)			101.2		%		90-110	07-NOV-19
WG3213566-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	07-NOV-19
WG3213566-5 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	07-NOV-19
WG3213566-4 MS		**L2378268-6**						
Nitrite (as N)			108.0		%		75-125	07-NOV-19
WG3213566-8 MS		**L2378268-7**						
Nitrite (as N)			79.3		%		75-125	07-NOV-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-L-IC-N-WP	Water							
Batch R4902964								
WG3213566-3 DUP		L2378268-6						
Nitrate (as N)		0.0765	0.0763		mg/L	0.2	20	07-NOV-19
WG3213566-7 DUP		L2378268-7						
Nitrate (as N)		0.0786	0.0786		mg/L	0.0	20	07-NOV-19
WG3213566-2 LCS								
Nitrate (as N)			100.4		%		90-11(	07-NOV-19
WG3213566-6 LCS								
Nitrate (as N)			99.6		%		90-11(	07-NOV-19
WG3213566-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	07-NOV-19
WG3213566-5 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	07-NOV-19
WG3213566-4 MS		L2378268-6						
Nitrate (as N)			108.0		%		75-12[	07-NOV-19
WG3213566-8 MS		L2378268-7						
Nitrate (as N)			110.4		%		75-12[	07-NOV-19
PH-WP	Water							
Batch R4901790								
WG3213017-17 LCS								
pH			7.37		pH units		7.3-7.[	06-NOV-19
SO4-IC-N-WP	Water							
Batch R4902964								
WG3213566-3 DUP		L2378268-6						
Sulfate (SO4)		2.87	2.88		mg/L	0.5	20	07-NOV-19
WG3213566-7 DUP		L2378268-7						
Sulfate (SO4)		34.5	34.6		mg/L	0.3	20	07-NOV-19
WG3213566-2 LCS								
Sulfate (SO4)			100.8		%		90-11(	07-NOV-19
WG3213566-6 LCS								
Sulfate (SO4)			100.6		%		90-11(	07-NOV-19
WG3213566-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	07-NOV-19
WG3213566-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	07-NOV-19
WG3213566-4 MS		L2378268-6						
Sulfate (SO4)			107.6		%		75-12[	07-NOV-19
WG3213566-8 MS		L2378268-7						

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WP	**Water**							
Batch R4902964								
WG3213566-8 MS		**L2378268-7**						
Sulfate (SO4)			103.8		%		75-125	07-NOV-19
TDS-WP	**Water**							
Batch R4904965								
WG3213504-10 LCS								
Total Dissolved Solids			98.1		%		85-115	08-NOV-19
WG3213504-9 MB								
Total Dissolved Solids			<4.0		mg/L		4	08-NOV-19
TURBIDITY-WP	**Water**							
Batch R4901646								
WG3212230-6 DUP		**L2378268-6**						
Turbidity		5.27	5.43		NTU	3.0	15	06-NOV-19
WG3212230-5 LCS								
Turbidity			102.5		%		85-115	06-NOV-19
WG3212230-4 MB								
Turbidity			<0.10		NTU		0.1	06-NOV-19
UV-%TRANS-WP	**Water**							
Batch R4902145								
WG3213313-1 IRM		**BLANK**						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	07-NOV-19
WG3213313-2 LCS								
Transmittance, UV (254 nm)			97.1		%		85-115	07-NOV-19

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 ReferenceMaterial
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	6	06-NOV-19 09:00	06-NOV-19 12:00	0.25	3.1	hours	EHTR-FM
	7	06-NOV-19 09:30	06-NOV-19 12:00	0.25	2.4	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: EHT:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry. Exceeded ALS
Rec. HT:	recommended hold time prior to analysis.
	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 L2378268 were received on 06-NOV-19 13:25.

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.

L2378268

L2378268-COFC

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

ONLY I ... VOC Samples

Report to Operator (email pdf):		**Owner billing (Email):**		**Regular Service (default):**	**Regular Service (is 5-7 Days):**
Contact:	Glen Campbell	Contact:	Colleen Johnson	☐	
Address:	Box 249,Whitemouth,MB,R0E 2G0	Address:	Box 249,Whitemouth,MB,R0E 2G0	☐ **Unless otherwise requested:**	**1 Day, rush / priority**
Phone:	204-348-2574	Phone:	204-348-2221		**2 Day, rush / priority**
Email:	utility@mwhitemouth.com	Email:	cao@rmwhitemouth.com		**3 Day, rush / priority**

Operator contact update (if different then above):		**Owner contact update (if different then above):**		**Email pdf copy to:**	
Contact:		Contact:		DWO:	Shannon Ganter
Address:		Address:		DWO Address	unit B-284 Reimer Avenue
Phone:		Phone:		DWO Phone:	(204)-371-3885
Email:		Email:		DWO Email:	shannon.ganter@gov.mb.ca

Account:		ODW Report type:	EMS (Lab-MWS)	**Client / Project Information:**	
Agency Code:	382	Project:	DWQ-C	Operation Name:	Whitemouth- PWS
Lab:		Lab Work Order # / Job # (lab use only)		Operation Code (corn code):	249.25
				Operation Id:	7238
				Sampled by:	GLEN CAMPBELL

Lab Sample # (lab use only)	Sample Number (YYMMHH9999)	Station Number (MB99XXD999) / (MB99XXY999)	Sample Identification	Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type	MB-CH-PWS-V2013	UMET-T-L-MS-WP (To	Number of Containers
	1903SG0010	MB05PHD041	Whitemouth 1 - Raw	06/11/19	9:00	6	1	X		4
	1903SG0011	MB05PHD042	Whitemouth 2- Treated	06/11/19	9:30	10	1	X		4
	1903SG0012	MB05PHD043	Whitemouth 3- Distribution	06/11/19	10:30	9	1		X	1

Analysis Request

Sample Matrix:	Sample Type:
6-Raw Water, 10-Treated Water	1-Grab Sample

Failure to complete all portions of this form may delay analysis.
Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory.
For ALL other testing, please use Laboratory specific forms.

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

Relinquished By:	Date & Time:	Received By (lab use only)	Date & Time: (lab use only)	Sample Condition (lab use only)	
				Temperature	Samples Received in Good Condition? Y / N (if no provide details)
GLEN C.	06/11/19 10:30AM	AR	Nov 6 1:25		
Relinquished By:	Date & Time:	Received By (lab use only)	Date & Time: (lab use only)		
		C~		11.7	

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