2020 RM of Wallace-Woodworth, Ward 2, Utility Annual Report

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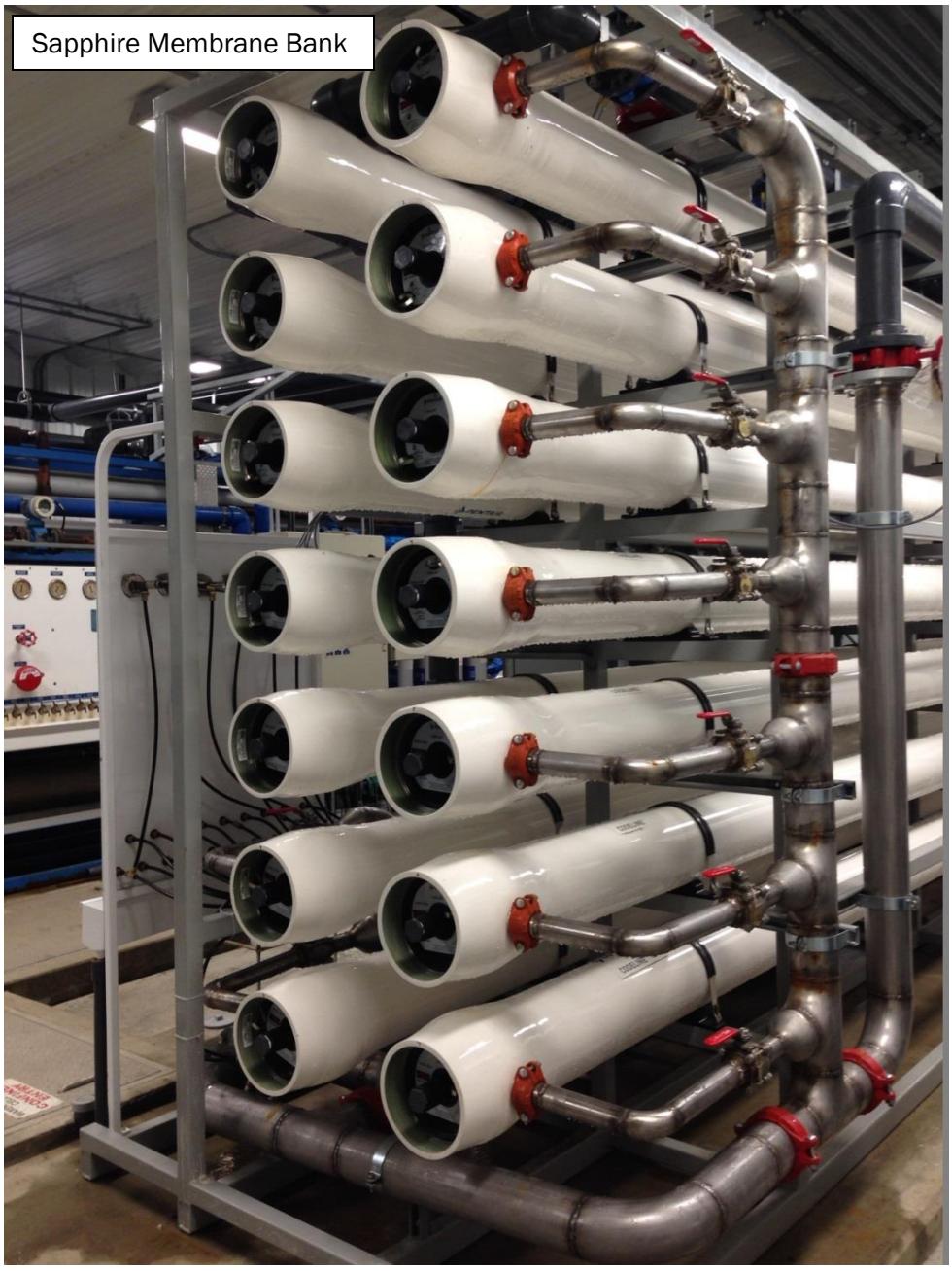
EXECUTIVE SUMMARY

The 2020 Public Water System Annual Report for the RM of Wallace-Woodworth, Ward 2 Water Utility has been created to promote public transparency with regard to the drinking water produced. The public has a right to easy access to information relating to the water they drink and the systems that provide it. It is the intention of the RM of Wallace-Woodworth to provide its utility ratepayers with this information in the following report.



Sapphire Membrane Bank

DESCRIPTION OF WATER SYSTEM

The RM of Wallace-Woodworth, Ward 2 Public Water System (PWS) provides safe potable water to residents in the RM of Wallace, Village of Maryfield, RM of Pipestone (including the Village of Reston) through a distribution system and Truck Fill Stations. The treated water produced at the Water Treatment Plant (WTP) meets or exceeds all health standards and aesthetic objectives as stated in the *Guidelines for Canadian Drinking Water* Quality.

RAW WATER SUPPLY

The water source for the Wallace-Woodworth, Ward 2 Water System is the Assiniboine Alluvial Aquifer which is located ¼ mile east of PTH 83 southwest of the Assiniboine River. The production wells are located approximately 5.0 km north of the Water Treatment Plant. Both wells operate with 150 HP motor and pump to give a level of redundancy allowing raw water to be delivered when one well is down for maintenance. In co-operation with Manitoba Water Services Board (MWSB) and the RM of Pipestone we now have a back-up natural gas generator for the operation of the control building and two supply wells.

At the valley well site (SE 24-13-27 W), the RM of Wallace-Woodworth, Ward 2 is licensed by Manitoba Conservation and Water Stewardship to divert raw water from the wells at a rate of 0.05 m^3/s with a total volume not exceeding 1,554,190 m^3 in any one year. The water source is classified as groundwater source by the Office of Drinking Water.

The raw water source has naturally occurring levels of ammonia, manganese, iron, sodium, turbidity hardness, total dissolved solids (TDS) and total organic carbon (TOC).

WATER TREATMENT PROCESS

Raw water is pumped from the well to the water plant where it is processed by the membrane treatment system. Prior to entering the membrane system, the raw water is injected with anti-scalent to control scaling due to calcium, magnesium, barium, strontium, iron and manganese. Raw water then passes through strainers and enters the membrane treatment unit (MTU).

The addition of the RO unit and Greensand filters the Water Treatment Plant will be able to produce more than, twice as much water (57 litres per second) as the original single R/O unit.

The water after passing through the Greensand filters joins the permeate water after passing through the R/O unit and is injected with sodium hydroxide (to adjust pH levels) and sodium hypochlorite (liquid chlorine) for disinfection prior to discharge into the storage reservoir.

The Greensand filters are for removal of iron, manganese, hydrogen sulfide, arsenic and radium. For our system the main focus is to remove iron and manganese.

Treated water is also pumped to the Kola pump house where it is stored in the Kola reservoir. The water is then pumped from the Kola reservoir and distributed to the community of Kola. The Village of Maryfield also receives water from the RM of Wallace-Woodworth utilizing a storage reservoir before distributing the water to the residents of Maryfield.

In co-operation with Manitoba Water Service Board (MWSB) and the RM of Pipestone we now have a back-up natural gas Generator for the operation of the Water Treatment Plant.

TREATED WATER STORAGE FACILITIES

The existing concrete reservoir consists of 5-chambers which stores approximately 2,250 m^3 of treated water. The submersible distribution pumps draw water from this reservoir. The Kola pump house also consists of a 2-chamber concrete reservoir with 96 m^3 of storage.

TREATED WATER DISTRIBUTION SYSTEM

The distribution pumping system consists of three submersible duty pumps (two 25 HP and one 40 HP) and one diesel-driven vertical turbine standby pump. The water system also has four booster stations as well as the Kola pump house to distribute the water to customers.

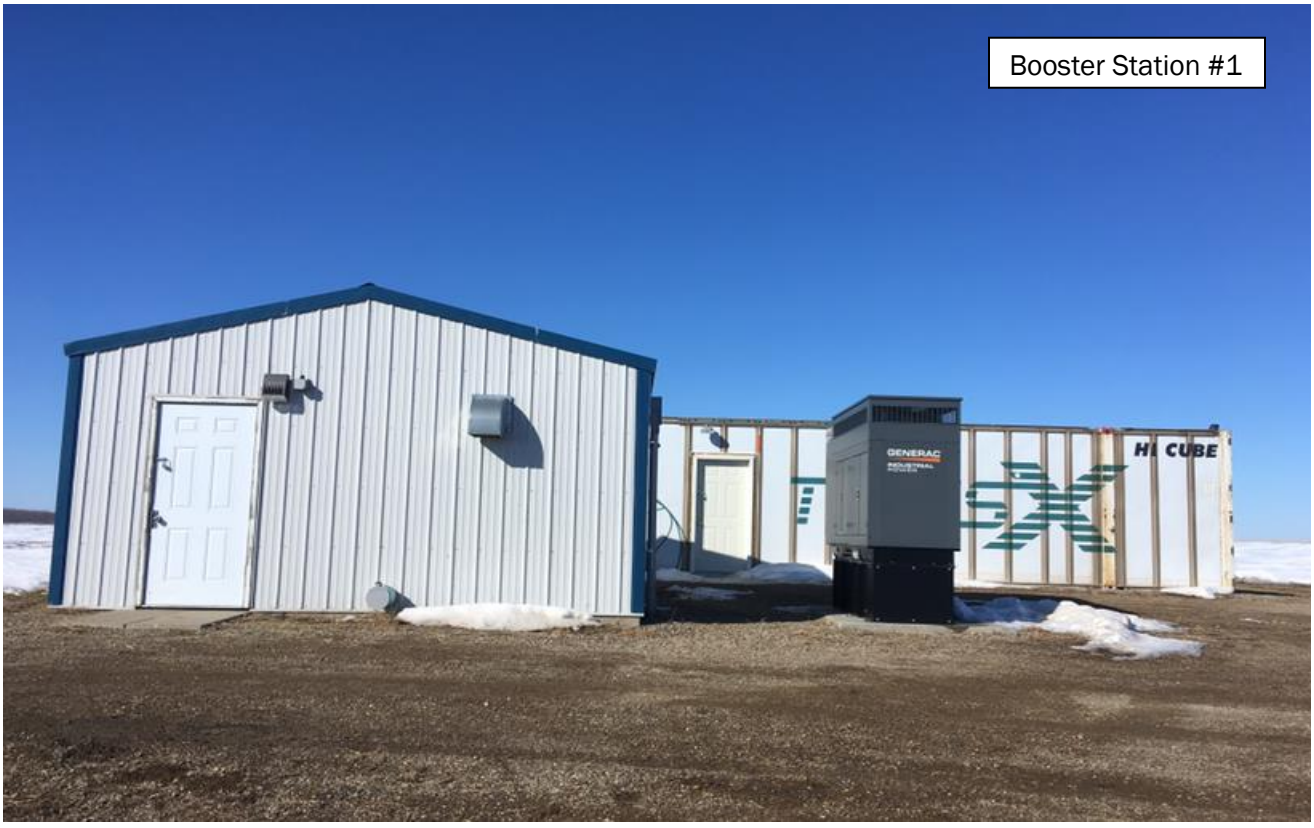
Booster Station No. 1 (NE 3-11-27 WPM) consist of two 30 HP duty pumps, and a 15 HP jockey pump (which supports the main duty pumps during low demand), all controlled by VFD.

Booster station No. 2 (SE 4-11-28 WPM) consist of two 20 HP duty pumps, and a 5 HP jockey pump (which supports the main duty pumps during low demand), all controlled by VFD.

Booster station No. 3 (NW 16-10-28 WPM) consist of two 7.5 HP pumps that are VFD controlled.

Booster station No. 4 (NW 18-10-29 WPM) consist of two 5 HP pumps that are VFD controlled.

The Kola pump house contains two 2 HP submersible pumps to supply the community of Kola.



POPULATION SERVICED

The RM of Wallace-Woodworth, Ward 2 Water Utility is comprised of 416 service connections that include residential connections with 38mm service lines and 5/8" meters, livestock connections with 50mm service lines with ¾" meters, commercial connections with 2".

The RM of Pipestone, with the help of the MWSB added about 45 additional rural services in the north central part of their RM and an 8" HDPE water line to Reston that is supplying the Village of Reston with the RM of Wallace-Woodworth treated water.

WATER QUALITY/ TREATMENT 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 and two regulations under the *Drinking Water Safety Act.*

The RM of Wallace-Woodworth, Ward 2 Water Utility routinely tests the water for multiple parameters at various locations in the treatment and distribution process to ensure the safety of the water from the source to the consumers` tap is maintained at all times. The Office of Drinking Water requests that every three years Public Water suppliers submit raw and treated water samples for general chemistry analysis.

LIST OF WATER QUALITY STANDARDS AND TEST RESULTS

Parameter	Units	Quality Standard	Raw Results	Treated Result
Arsenic	Mg/L	Less than or equal to 0.01	0.00039	0.00010
Benzene	Mg/L	Less than or equal to 0.005	<0.00050	< 0.00050
Fluoride	Mg/L	Less than or equal to 1.5	0.28	0.035
Lead	Mg/L	Less than or equal to 0.005 in the water distribution system	0.000127	0.000126
Nitrate	Mg/L	Less than or equal to 10 measured as nitrogen	0.169	0.0413
Trichloroethylene	Mg/L	Less than or equal to 0.005	<0.00050	< 0.00050
Tetrachloroethylene	Mg/L	Less than or equal to 0.03	<0.00050	< 0.00050
Uranium	Mg/L	Less than or equal to 0.02	0.00424	< 0.000466

The treatment aims to reduce concentrations of iron, manganese, and hardness to produce water that is less scale forming and discolored. The results indicate the treated water meets all health-related guidelines.

ANALYTICAL REPORT

PHYSICAL TESTS (WATER)

				L2498180-1 02-SEP-20 09:30 WALLACE REGIONAL 1 - RAW	L2498180-2 02-SEP-20 09:30 WALLACE REGIONAL 2- TREATED
ALS ID Sampled Date Sampled Time Sample ID					
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	<5.0	<5.0
Conductivity	umhos/cm	-	-	1350	245
Hardness (as CaCO3)	mg/L	-	-	472 HTC	54.4 HTC
Langelier Index (4 C)	No Unit	-	-	0.53	-1.2
Langelier Index (60 C)	No Unit	-	-	1.3	-0.39
pH	ph units	7.00-10.5	-	7.70	7.46
Total Dissolved Solids	mg/L	500	-	884	145
Transmittance, UV (254 nm)	%T/cm	-	-	87.3	96.6
Turbidity	NTU	-	-	0.14	0.57

The treated results show that the treatment is meeting the guide limits.

ANIONS AND NUTRIENTS (WATER)

				L2498180-1 02-SEP-20 09:30 WALLACE REGIONAL 1 - RAW	L2498180-2 02-SEP-20 09:30 WALLACE REGIONAL 2- TREATED
ALS ID Sampled Date Sampled Time Sample ID					
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO3)	mg/L	-	-	405	79.1
Ammonia, Total (as N)	mg/L	-	-	0.246	0.019
Bicarbonate (HCO3)	mg/L	-	-	494	96.5
Bromide (Br)	mg/L	-	-	0.195	<0.010
Carbonate (CO3)	mg/L	-	-	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	81.9	12.4
Fluoride (F)	mg/L	-	1.5	0.28	0.035
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.169	0.0413
Nitrite (as N)	mg/L	-	1	<0.0050 DLM	<0.0010
Sulfate (SO4)	mg/L	500	-	258	29.1

TOTAL METALS (WATER)

			ALS ID Sampled Date Sampled Time Sample ID	L2498180-1 02-SEP-20 09:30 WALLACE REGIONAL 1 - RAW	L2498180-2 02-SEP-20 09:30 WALLACE REGIONAL 2- TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Aluminum (Al) – Total	mg/L	0.1	-	<0.0030	<0.0030
Antimony (Sb) – Total	mg/L	-	0.006	<0.00010	<0.00010
Arsenic (As) – Total	mg/L	-	0.01	0.00039	0.00010
Barium (Ba) – Total	mg/L	-	2	0.0219	0.00265
Beryllium (Be) – Total	mg/L	-	-	<0.00010	<0.00010
Bismuth (Bi) – Total	mg/L	-	-	<0.000050	<0.000050
Boron (B) – Total	mg/L	-	5	0.221	0.163
Cadmium (Cd) – Total	mg/L	-	0.005	0.0000056	<0.0000050
Calcium (Ca) – Total	mg/L	-	-	103	12.2
Cesium (Cs) – Total	mg/L	-	-	<0.000010	<0.000010
Chromium (Cr) – Total	mg/L	-	0.05	<0.00010	<0.00010
Cobalt (Co) – Total	mg/L	-	-	0.00017	<0.00010
Copper (Cu) – Total	mg/L	1	2	0.00152	0.319
Iron (Fe) – Total	mg/L	0.3	-	<0.010	<0.010
Lead (Pb) – Total	mg/L	-	0.005	0.000127	0.000126
Lithium (Li) – Total	mg/L	-	-	0.103	0.0139
Magnesium (Mg) – Total	mg/L	-	-	52.1	5.84
Manganese (Mn) – Total	mg/L	0.02	0.12	0.570	0.00276
Molybdenum (Mo) – Total	mg/L	-	-	0.000792	0.000092
Nickel (Ni) – Total	mg/L	-	-	0.00122	<0.00050
Phosphorus (P) – Total	mg/L	-	-	<0.030	<0.030
Potassium (K) – Total	mg/L	-	-	8.42	1.15
Rubidium (Rb) – Total	mg/L	-	-	0.00053	<0.00020
Selenium (Se) – Total	mg/L	-	0.05	0.000817	0.000052
Silicon (Si) – Total	mg/L	-	-	11.9	1.44
Silver (Ag) – Total	mg/L	-	-	<0.000010	<0.000010
Sodium (Na) – Total	mg/L	200	-	146	34.5
Strontium (Sr) – Total	mg/L	-	7	0.575	0.0650
Sulfur (S) – Total	mg/L	-	-	92.6	10.4
Tellurium (Te) – Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl) – Total	mg/L	-	-	<0.000010	<0.000010
Thorium (Th) – Total	mg/L	-	-	<0.00010	<0.00010
Tin (Sn) – Total	mg/L	-	-	<0.00010	<0.00010
Titanium (Ti) – Total	mg/L	-	-	<0.00030	<0.00030
Tungsten (W) – total	mg/L	-	-	<0.00010	<0.00010
Uranium (U) – Total	mg/L	-	0.02	0.00424	0.000466
Vanadium (V) – Total	mg/L	-	-	<0.00050	<0.00050
Zinc (Zn) – Total	mg/L	5	-	<0.0030	0.0052
Zirconium (Zr) – total	mg/L	-	-	<0.00020	<0.00020

The treated results show that the treatment is meeting the guide limits.

ORGANIC/INORGANIC CARBON (WATER)

			ALS ID Sampled Date Sampled Time Sample ID	L2498180-1 02-SEP-20 09:30 WALLACE REGIONAL 1 - RAW	L2498180-2 02-SEP-20 09:30 WALLACE REGIONAL 2- TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	3.34	<0.50
Total Organic Carbon	mg/L	-	-	3.29	<0.50

VOLATILE ORGANIC COMPOUNDS (WATER)

			ALS ID Sampled Date Sampled Time Sample ID	L2498180-1 02-SEP-20 09:30 WALLACE REGIONAL 1 - RAW
Analyte	Unit	Guide Limit #1	Guide Limit #2	
Benzene	mg/L	-	0.005	<0.00050
1,1-dichloroethene	mg/L	-	0.014	<0.00050
Dichloromethane	mg/L	-	0.05	<0.0050
Ethylbenzene	mg/L	0.0016	0.14	<0.00050
MTBE	mg/L	0.015	-	<0.00050
Tetrachloroethene	mg/L	-	0.01	<0.00050
Toluene	mg/L	0.024	0.06	<0.00050
Trichloroethene	mg/L	-	0.005	<0.00050
o-Xylene	mg/L	-	-	<0.00050
M+P-Xylenes	mg/L	-	-	<0.00040
Xylenes (Total)	mg/L	0.02	0.09	<0.00064
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-	86.1
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-	95.3

BACTERIOLOGICAL TESTING

The RM of Wallace Water-Woodworth, Ward 2 Utility tests the treated water at the plant, along with treated water in the distribution system bi-weekly for the presence of Total Coli forms (TC) and E. Coli (EC) bacteria. If these bacteria are present in the water it is an indication that disease causing organisms may also be present.

DISINFECTION RESIDUALS

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of disease causing organisms in water. The *Drinking Water Safety Act* and supporting regulations require that water is disinfected before it leaves the water treatment facility and that an adequate amount of disinfectant is in the distribution system (water piping network) to ensure the water is safe right to the consumer's tap. The regulation states that chlorine residuals meet or exceed the following standards:

- 0.5 mg/l of free chlorine is present when the water enters the distribution system after a minimum of 20 minutes of contact time
- 0.1 mg/l of free chlorine is present at all times at any point in the distribution system.

Parameter	Standard	Treated Compliance	Distribution Compliance
Total Coliform	0 TC / 100ml	100% (26/26 samples)	100% (26/26 samples)
E. Coli	0 EC / 100ml	100% (26/26 samples)	100% (26/26 samples)
Free Chlorine (WTP)	> 0.5 mg/L	100% (365/365)	
Free Chlorine (DIST.)	>0.1 mg/L		100% (365/365)

WTP – Water Treatment Plant
DIST - Distribution

The RM of Wallace-Woodworth, Ward 2 Water Utility meets this requirement by adding 12% sodium hypochlorite solution to the treated water that leaves the membrane treatment system prior to it entering the treated water reservoir. The sodium hypochlorite is added by a positive displacement metering pump that ensures an accurate and consistent amount of chlorine is added to the water and the treated water reservoir allows for sufficient contact time to ensure that the disinfection of the treated water before it enters the distribution system. Chlorine residuals are tested daily at the water Treatment plant and at the Kola pump house along with bi-weekly testing of the chlorine residuals throughout the distribution system.

CORRECTIVE ACTION

The RM of Wallace-Woodworth Ward 2 Water Utility must complete a Corrective Action Form whenever they are not able to meet the standards for disinfection, turbidity or bacteriological test results. The forms explain how the issues were dealt with along with the results of the actions taken and dare sent in to the Office of Drinking Water.

LIST OF CORRECTIVE ACTIONS TAKEN

NONE.

BOIL WATER ADVISORY

The Office of Drinking Water has the authority to issue a Boil Water Advisory if they have concern that the safety of potable water is not 100% certain. Changes to aspects of a potable water system can affect the water distributed to customers and the safety of the water has to be confirmed before the Office of Drinking Water will allow water to be distributed without a Boil Water Advisory in place.

LIST OF BOIL WATER ADVISORIES ISSUED

NONE.

CHARGES LAID AGAINST THE UTILITY PURSUANT TO *THE DRINKING WATER SAFETY ACT*

NONE.

MAJOR WORKS COMPLETED IN 2020

- Replaced one of the 25HP Distribution Pumps and Motor - $11,783.00
- Repaired West Supply Well VFD - $12,935.50
- Annual service work on all back-up Power Generators - $13,000.00
- New replacement membranes for both the membrane treatment units (MTU) - $169,693.44
- The Wallace Public Water System along with funding assistance from the Manitoba Water Service Board completed the following necessary capital improvements: 1) Completed the work on the intake screen, installed a new pump and motor and put the west supply well back in operations. 2) The east supply well received redevelopment along with new drop pipe and check valve. - $120,003.47

GOING FORWARD

The water utilities have remained separate systems for physical water, billing and collecting, and for licensing from the Office of Drinking water.

Over the next couple years, the Wallace Public Water System along with funding assistance from the Manitoba Water Services Board will do exploratory work on the aquifer to determine the drawing area, size, and the future available source of raw water. Plans will look at the possibility of a 3rd supply well to meet the future demand. Estimated cost is $250,000.00 - $350,000.00. The next step would be to supply the Water Treatment Plant with the increased available source of raw water to meet the growing demand. This would include pumping station, power backup generator and all mechanical requirements with an estimated cost of $350,000.00 - $550,000.00.

USAGE CHART

Source	Raw	Permeate	Concentrate	Distribution	Truck Fill	Plant Usage
2020 Usage m^3	727,610	486,527	161,780	475,816	1,569.2	103.5
2020 Usage Gallons	163,712,250	109,468,575	36,400,500	107,058,600	353,070	23,287.5

CLASSIFICATION AND CERTIFICATION

Classification:

- Water Treatment Facility – Class II (2)
- Water Distribution – Class II (2)

Certification:

- Utility Manager – WTII, WDII, WWTII, WWDII
- WTP2 Operator in Charge – WTII, WDII, WWTI
- WTP1 Operator in Charge – WTII, WDII, WWTI, WWDII
- Distribution Operator in Charge – WTI, WDI, WW Small System
- Relief Operator – WTI, WDI, WW Small System

WT – Water Treatment
WD – Water Distribution
WWT – Waste Water Treatment
WWD – Waste Water Distribution
WTP – Water Treatment Plant
WW – Waste Water

CONTACT INFORMATION

For more information on the Wallace Public Water System and operation please visit the website at www.wallace-woodworth.com or contact the office at 204-748-1239.

This document was completed March, 2021 by, Don Todorovich, Utility Manager for the RM of Wallace-Woodworth.

Water System Emergency After Hours Number:

(204) 851-0802