Municipality of Russell Binscarth

Public Water System Annual Report

2023

Name of the Public Water System: **Municipality of Russell Binscarth Public Water System**

Name of the Legal Owner: Municipality of Russell Binscarth

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Water System's Emergency Number: (204) 773-6009

Name of Operator: Shaun Seib Water Treatment Plant Operator

Date prepared: March 30th, 2024

James Fielder
Chief Administrative Office
Municipality of Russell Binscarth

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Introduction:

The 2023 Annual Report for the Municipality of Russell Binscarth summarizes the Water Utility's ability to produce safe potable water and meet provincial regulations.

1. Description of the Water System:

The Municipality of Russell Binscarth Public Water System provides potable drinking water to a population of 2504 residents (2022 Census). Treated water produced at the Russell Binscarth Regional Water Treatment Plant meets all health and aesthetic objectives as stated in the guidelines for Canadian Drinking Water Quality.

1.1 Water Supply Source:

The Russell Binscarth Regional Water Treatment Plant receives ground water from 2 wells located approximately 11 kilometers northeast of Russell. The 2 wells draw raw ground water from a large sand and gravel aquifer. The raw water from the wells is pumped into a 250 mm pipeline which is reduced to a 200 mm pipeline and flows to the Russell Binscarth Regional Water Plant for treatment.

Both wells were drilled in 2015 at a depth of approximately 150 feet. Both wells are active and are the exclusive sources of water for the town of Russell, village of Binscarth, Angusville and Rossburn.

As the water flows through the ground, it dissolves metals and minerals. In the case of the aquifer accessed by the town of Russell, the water has come into contact with iron and calcium carbonate (hardness causing mineral). These items do not pose health concerns, rather they are known as aesthetic water quality parameters.

1.2 Water Treatment Process:

Iron and manganese are metals that cause laundry and plumbing fixture staining problems. In addition, these materials can build up in the distribution pipes and cause reduced flow. Calcium carbonate causes hardness in water, which diminishes the ability of the water to react with soap and form lather. Hardness also forms scale deposits in kettles and hot water tanks which can reduce the life expectancy of these appliances.

The current water treatment process consists of the use of a 3-Green Sand RO blend system. The water enters the 3-Green Sand filters that are designed to remove iron and manganese from the raw water to acceptable levels. After going through the Green Sand filters, the water enters the R/O membrane through pre-filters then into the main R/O membrane filters. This removes all the rest of the minerals from the water from the Green Sand filters, softening the water down to a total hardness averaging 85-90 mg/L and mineral free. With regards to hardness, people have individual preferences about the amount of hardness they desire in their water. Individual homeowners, who desire softer water, have the ability to install softeners.

Once the hardness of the water has been addressed, chlorinating and fluoridation occurs. Aqua mag and sodium hydroxide are also added to stabilize the PH level which then prevents water main and household plumbing corrosion and deterioration. The treated water enters the reservoir and is then stored in a treated water reservoir located beneath the plant.

1.3 Distribution System:

Treated water from the Russell Binscarth Regional Water Treatment Plant is stored in the underground reservoir or pumped to the town of Russell Water Tower via a one of three 200 GPM pumps. Water is then distributed to the community of Russell from the water tower providing steady pressure and constant. The distribution system within Russell has an approximate piped length of 28 kilometers. Piping is comprised of 75% cast iron and 25% PVC in the community of Russell.

Since April 2018, treated water from the Regional Water Treatment Plant is being distributed to the village of Binscarth through 100 % high density plastic pipe. Piping in the village of Binscarth is comprised of a mixture of cast iron and PVC.

The Russell Binscarth Regional Water Treatment Plant now provides water to 4 other communities via 75 kilometers of high-density plastic pipe; Binscarth and Gambler to the south of Russell and Angusville and Rossburn plus 4 private rural residents to the east of Russell.

A booster station is required due to having to pump water via pipeline through a valley north of Waywayseecappo First Nation, which requires an increase of water pressure to push the water up and out of the valley to the community of Rossburn.

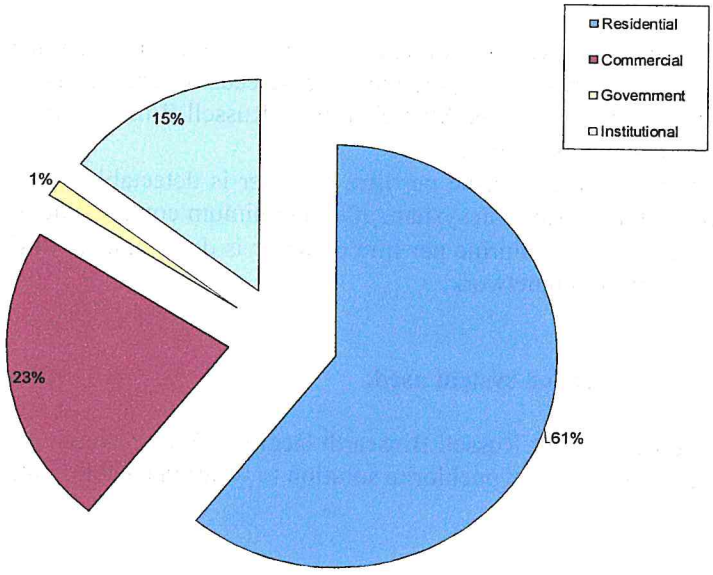
1.4 Storage Reservoirs:

Treated Reservoir – Underground – 1.6 million litres – Russell
Treated Reservoir – Water Towers – 225,000 litres – Russell
Treated Reservoir – Underground – 340,687 litres – Binscarth

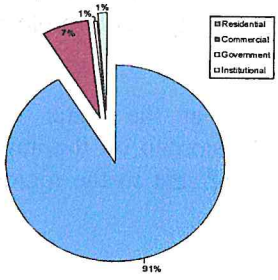
1.5 Connections, Population and Types of Users:

The Municipality of Russell Binscarth distribution system is comprised of – 1,020 service connections; Russell – 800 connections and Binscarth – 220 connections. All service connections are metered. Water is provided to a large demographic (see graph).

Russell



Binscarth



1.6 Classification and Certification:

- The Municipality of Russell Binscarth Regional Water Treatment Plant is a Class II Water Facility as per the Manitoba Conservation's Water and Wastewater Facility Operators Regulation under the Environment Act
- Current operator of the facility and his certification level are as follows:
  - Shaun Seib - Water Treatment Plant Operator Class II

2. Disinfection System in Use:

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of potential disease-causing organisms in water. As per the *Drinking Water Safety Act* the Municipality of Russell Binscarth PWS must ensure that a 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.
- 0.1 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 Municipality of Russell Binscarth Regional Water Treatment Plant disinfects by adding 12% sodium hypochlorite solution to water via a chlorination pump.

2.2 Equipment redundancy and monitoring requirements:

As required by the *Drinking Water Safety Act* the Municipality of Russell Binscarth PWS ensures continuous disinfection is maintained at the plant by keeping in stock all spare parts required for the chlorination pump. A complete spare chlorination pump is also kept at the plant.

Disinfectant residuals are monitored daily at the water treatment plant and periodically in the distribution system and recorded on the appropriate monitoring forms. Monthly chlorination report forms are sent to the regional Drinking Water Officer at the end of each month.

2.3 Disinfectant residual overall performance/results:

For 2023, the Municipality of Russell Binscarth Public Water System has met all regulatory requirements in regard to monitoring and reporting disinfection residuals leaving the water treatment plant and in the distribution system. (see Table 1).

Table 1 - Disinfection Monitoring and Reporting		
Chlorine Requirements	Regulatory Requirement	PWS Performance
A) Free chlorine residual entering the distribution system Section 21 (1) a - MR 40/2007	≥ 0.5 mg/L	100%
B) Free chlorine residual in the distribution system Section 22 a - MR 40/2007	≥ 0.1 mg/L	100%
C) Frequency of testing Schedule A - MR 40/2007	Daily	100%
	Bi-Weekly	100%
D) Report submissions Section 25 (2) - MR 40/2007	Monthly	100%
Comments: The Public Water System has met the regulatory requirements for 2023.		

3. List of Water Quality Standards:

The Province of Manitoba has adopted several water quality standards from the *Guidelines for Canadians Drinking Water Quality*, developed by Health Canada. The parameters are health-based, and they express the maximum acceptable concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The 2023 results for the Municipality of Russell Binscarth Regional Public Water System are summarized in the following tables (see Table 2 & 3):

Table 2 - Bacteriological Monitoring and Reporting			
	Regulatory Requirement		PWS Performance
Number of raw/incoming water samples Schedule A - MR 40/2007	52		100%
Number of treated water samples Schedule A - MR 40/2007	52		100%
Number of distribution water samples Schedule A - MR 40/2007	156		100%
Frequency of testing Schedule A - MR 40/2007	Bi-Weekly		100%
Total coliform present in water samples Section 3 (1) b - MR 41/2007	<1 TC per 100mL		100%
E. coli present in water samples Section 3 (1) a - MR 41/2007	<1 EC per 100mL		100%

Comments: The Public Water System has met the regulatory requirements for 2023.			
Table 3 - Chemical Water Quality Standards			
	Regulatory Requirement	Russell WTP RAW Water	Russell WTP Treated Water
Total Metals			
Aluminum	0.10 mg/L	< 0.0030 mg/L	0.0030 mg/L
Antimony	0.006 mg/L	<0.0010 mg/L	<0.0010 mg/L
Arsenic	0.01 mg/L	0.0281 mg/L	0.00028 mg/L
Barium	1 mg/L	0.0186 mg/L	0.00155 mg/L
Boron	5 mg/L	0.153 mg/L	0.131 mg/L
Cadmium	0.005 mg/L	< 0.0000050 mg/L	<0.0000050 mg/L
Calcium	N/A	151 mg/L	21.5 mg/L
Chromium	0.05	<0.00010 mg/L	<0.00018 mg/L
Copper	1 mg/L	<0.00050 mg/L	<0.118 mg/L
Iron	0.3 mg/L	2.46 mg/L	<0.010 mg/L
Lead	0.01 mg/L	<0.000050 mg/L	<0.000050 mg/L
Magnesium	0.12 mg/L	53.0 mg/L	7.48 mg/L
Manganese	0.12 mg/L	0.375 mg/L	0.00085 mg/L
Mercury (Hg) – Total	0.001 mg/L	<0.0000050 mg/L	<0.0000050 mg/L
Potassium	N/A	6.40	1.56 mg/L
Selenium	0.05 mg/L	<0.000050 mg/L	<0.000050 mg/L
Silver	N/A	<0.00010 mg/L	<0.000010 mg/L
Sodium	200 mg/L	27.3 mg/L	51.5 mg/L
Uranium	0.02 mg/L	0.00301 mg/L	0.000412 mg/L
Zinc	5 mg/L	0.0030 mg/L	<0.0104 mg/L
Anions & Nutrients			
Alkalinity (CaCO3)	N/A	465 mg/L	160 mg/L
Ammonia (N)	N/A	0.94 mg/L	<0.010 mg/L
Bicarbonate (HCO3)	N/A	567 mg/L	195 mg/L
Bromide (Br)	N/A	<0.045 mg/L	<0.10 mg/L
Carbonate (CO3)	N/A	<0.60 mg/L	<0.60 mg/L
Chloride (Cl)	250 mg/L	2.88 mg/L	3.23 mg/L
Fluoride (F)	1.5 mg/L	0.195 mg/L	0.718 mg/L
Hydroxide (OH)	N/A	<0.34 mg/L	<0.34 mg/L
Nitrate and Nitrite (N)	10 mg/L	<0.0050 mg/L	<0.0062 mg/L
Nitrate (N)	10 mg/L	<0.0050 mg/L	<0.0062 mg/L
Nitrite (N)	1 mg/L	<0.0010 mg/L	<0.0010 mg/L
Phosphorus (P)	N/A	0.0744 mg/L	1.44 mg/L
Sulfate (SO4)	500 mg/L	175 mg/L	23.3 mg/L
Sulphide (S)	N/A		

Sulphide (H2S)	0.05 mg/L		
Physical Tests dissolved organic carbon			
Hardness (CaCO3)	N/A	595 HTC	84.6 HTC
Total Dissolved Solids	500 mg/L	689 mg/L	205 mg/L
Comments:			

Volatile Organic Compounds			
Benzene	0.005 mg/L	<0.00ss050 mg/L	<0.00050 mg/L
Ethylbenzene	0.14 mg/L	<0.00050 mg/L	<0.00050 mg/L
Trichloroethylene	0.005 mg/L	Not Tested	Not Tested
Tetrachloroethylene	0.03 mg/L	Not Tested	Not Tested
Toluene	0.06 mg/L	<0.00050 mg/L	<0.00050 mg/L
Total Xylenes	0.09 mg/L	<0.00050 mg/L	<0.00050 mg/L

4. Water System Incidents, Corrective Actions and Maintenance Advisory:

Incident 1: January 11th, 2023 : Binscarth Pumphouse

A leaking pipe was found in the Binscarth pumphouse. Scheduled repair and notified DWO for a Boil water advisory as pumps had to be turned off which lowered the distribution pressure below 20psi. Repair was approximately 4 hours. BWA was rescinded on January 19th, 2023.

Incident 2: January 30th, 2023 : Low reservoir alarm in Binscarth.

Operator drove to Binscarth to check. While on his way, operator got a call from a resident reporting a water break on Government Road and Jemima St. Closed two valves and notified residents via door to door. Called DWO and issued BWA to the affected residents. Excavator was not available until February 1st. Repair was completed with a saddle. BWA was lifted late February 3rd, 2023.

Incident 3: February 1st, 2023 : 400 Block of Augusta St. Russell.

Call around 7:45 pm of water coming from the ground. Located and isolated valves. Nine homes & one church were affected from McDonald St. to Langford St. Notified after hours DWO & handed out notices the next day at 7am. T&C trenching completed repair with a saddle. Samples sent to lab on February 6th and BWA was lifted on February 9th, 2023

Incident 4: May 2nd, 2023 : 200 Block on Main St.

Water was noticed coming out of the ground. Chased for the day on May 3rd, we had to isolate valves which put two blocks on BWA after calling the DWO. Leak was located to fire hydrant in front of Prairie Collective. As we did not have the

right replacement parts in stock, valve was temporarily turned off in front of the hydrant to stop the leak and would repair at a later date. BWA was lifted on May 10th, 2023.

Incident 5: May 23rd, 2023 : Low reservoir alarm in Binscarth

Approximately 12:30AM, operator received an alarm of low reservoir. Arrived in Binscarth around 12:50AM. Water was found at the corner of Russell St. and 4th Ave. At 4:30AM, proper valves were located and turned off. Reservoir was completely emptied which caused low pressure and cause a town wide BWA. T&C trenching was called in to do repair. Saddle was used over crack. Reservoir needed to be filled before pumps could be turned on to restore service. Approximately 3:30PM, pumps were on, and samples were taken the next day. BWA was rescinded on May 29th, 2023.

Incident 6: June 4th, 2023 : Pump failure distribution in Binscarth.

Pressure fails to below 20psi before operator could get to Binscarth to resolve. Notified DWO and BWA was issued for whole town. BWA could not be lifted until a plan could be put in place to avoid pump failure again. BWA was rescinded on June 27th, 2023.

Incident 7: July 8th, 2023 : Low pressure alarm in Binscarth.

Approximately 6PM, operator got an alarm of low pressure in Binscarth. When operator got to the pumphouse, there was water on the floor. DWO was informed of distribution pressure below 20psi. Town was put on a BWA. After investigating it was detected that a check valve had failed. A replacement was ordered. BWA was rescinded on July 13th, 2023.

Incident 8: August 11th, 2023 : 100 Block on Memorial Ave. N

Around 1:30PM, water was noticed on the ground. It was not big, so operator left water on until August 14th. T&C did repair, DWO was notified prior and BWA was issued, and notices were handed out. As valves were not seating properly, we had to keep expanding the affected areas. Ended up being all of Pelly Ave. from Assiniboine to Hwy 16, Memorial Ave. to Westbourne and Heather St. Once the repair is done, samples were taken to the lab. First set failed so operator had to retest. BWA was lifted on August 21st, 2023.

Incident 9: August 23rd, 2023 : Corner of Russell and Ellice Ave.

Water was noticed in the ditch. Break was isolated by closing two valves only affecting two businesses and fire hall. DWO was notified and BWA was issued. T&C was called in to do repair. After getting the hole dug, it started raining too strong and water was filling the hole. Repair had to be postponed until next day. Repair done with saddle. Lifted BWA on August 30th, 2023.

Incident 10: October 23rd, 2023 : Low pressure on the 100 block of 1st Ave in Binscarth.

After a resident complained of low pressure, it was determined they had a leak in their service connection. It was determined that they were also on a line out to Paterson Grain. So valve had to be turned off. Called DWO and BWA was issued.

Repair was done the next day by T&C. BWA was rescinded on November 9th, 2023.

Incident 11: December 5th, 2023 : 200 Block of Main St. Russell

T&C was ready to repair the hydrant in front of Prairie Collective. Hole was dug and DWO was notified. BWA was issued to the affected residents and businesses. December 6th, T&C was done with repair and valves were closed. Operator took water sample for tests. BWA was rescinded on December 15, 2023.

5. Additional records required:

No requests for additional records were received in 2023.

6. Drinking Water Safety Orders on your System and Actions Taken in Response

In 2023, no Drinking Water Safety Orders were issued for the town of Russell Public Water System.

7. Boil Water Advisories Issued and Actions Taken in Response:

In 2023, Eleven (11) Boil Water Advisory were issued for a part of the town of Russell Binscarth Public Water System impacted by water breaks:

Incident 1: January 11th, 2023
Incident 2: January 30th, 2023
Incident 3: February 1st, 2023
Incident 4: May 2nd, 2023
Incident 5: May 23rd, 2023
Incident 6: June 4th, 2023
Incident 7: July 8th, 2023
Incident 8: August 11th, 2023
Incident 9: August 23rd, 2023
Incident 10: October 23rd, 2023
Incident 11: December 5th, 2023

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

In 2023, no Warnings were issued, or charges laid on the System.

9. Major Expenses Incurred:

In 2017, $9.1 million was spent on the construction of a Regional Water Treatment Plant and Pipeline which will take treated water to the communities of Binscarth, Gambler, Angusville and Rossburn.

In 2018, an additional $3.3 million was spent to finalize the construction of the Regional Water Treatment Plant and Pipeline.

In 2020, 6-inch Water Main Replacement on Shell River Ave between Russell Street and Westbourne Street.

In 2020, 4-inch water main replacement on Darcy Street between Ellice Avenue and Shell River Avenue.

In 2021, a portion of the 6-inch water main replacement on Main Street was replaced from the 16 Hwy to the Russell Tire Connection.

In 2022, membranes in the RO system have been switched out.

10. Future System Expansion and/or Increased Production:

Discussions remain ongoing with neighboring Municipalities regarding future expansion of supply to these areas. The review and replacement of water mains is currently being conducted.