PUBLIC WATER SYSTEM ANNUAL REPORT

2023

Name of the Public Water System: Swan River Public Water System

Name of the Legal Owner: Town of Swan River

Contact Person: Darren Harvey,
Director of
Works

Phone: (204) 734-4586

Email: dharvey@townsr.ca

Website: www.swanrivermanitoba.ca

Water System's Emergency Number: (204) 734-8963 (Town Foreman)
(204) 734-0186 (WTP Operator)

Name of Operators: Paul Klein
Jordan Rooks

Phone During Business Hours: (204) 734-4628 WTP
7:30 a.m.- 4:30 p.m. (204) 734-0186 Cell

Emergency Numbers: (204) 734-0186

Date Prepared: Mar.6/2024

Darren Harvey

Darren Harvey
Director of Works
Town of Swan River

Table of Contents

Introduction:

The 2023 Annual Report for the Town of Swan River summarizes the Water Utility's ability to produce safe potable water and meet provincial regulations.

1. Description of the Water System:

The Town of Swan River Public Water System provides potable drinking water to a population of 4049 residents (2021 Census). Treated water produced from the 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 Town of Swan River Water Treatment Plant (WTP) receives groundwater from three wells located in the northeast corner of Swan River, 40 meters south of the Swan River. The three wells draw groundwater from an underground aquifer. Well #1 was drilled in 1974, Well #2 was sealed in 2018, Well #3 was drilled in 2001, and Well #4 was drilled in 2018. All three wells were drilled to a depth of approximately 95 feet. Raw water is pumped 800 m from the wells to the WTP in a 250 mm HDPE pipeline.

As water flows through the ground it dissolves metals and minerals. In the case of the aquifer, the water has come into contact with iron, manganese, and calcium carbonate (hardness causing mineral). While iron and calcium carbonate do not pose health concerns and only affect aesthetic water quality parameters, manganese does have a health based standard associated with it.(see table on page 5)

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 is designed to remove iron and manganese down to acceptable levels. With regards to hardness, people have individual preferences about the amount of hardness they desire in their water. Individual homeowners who desire softer water may install softeners to achieve this.

The Swan River water treatment process starts with the addition of potassium permanganate to incoming raw water influent, before entering a detention chamber and flowing through 6 manganese greensand filters. After greensand filtration, the water flows through an ultraviolet light unit as a preliminary disinfectant treatment of bacterial contaminants. Following this, water is injected with chlorine, fluoride and a liquid inhibitor to reduce corrosion and scale buildup in the distribution system. Treated water then flows through and is stored in 3 underground reservoirs, starting in one north of the plant, then to one west of the plant, and finally into a clearwell within the plant, prior to entering the distribution system.

1.3 Distribution System:

Treated water from the 2 reservoirs and clearwell is pumped throughout the Swan River distribution system, via three electric pumps, and 1 natural gas combustion motor standby pump. Pump #1 is a 7 stage vertical turbine pump, with 20hp 3 phase electric Variable Frequency Drive (VFD) , Pump #2 is a 7 stage vertical turbine pump, with 20hp 3 phase electric VFD drive, Pump #3 is a 7 stage vertical turbine pump, with 20hp 3 phase electric VFD drive. All 3 pumps and motors are identical, to allow interchangeability of parts. Pumps switch Lead Position every 24 hours, to increase longevity of pumps. When the lead pump can not meet the demand, the second and third pump(s) will turn on to assist as needed. The standby pump, which is manually operated, runs during power outages, or during high fire flow demands. There are 40 km of water main pipe, ranging in size from 4"-10".

1.4 Storage Reservoirs

Name: Reservoir #1	Capacity: 220,000 gal 1000 m^3
Name: Reservoir #2	Capacity: 415,000 gal 1886 m^3
Name: Clear well	Capacity: 70,000 gal 318 m^3
	Total Capacity of 705,000 gal 3200 m^3

1.5 Number of Connections, Population Served:

The Swan River distribution system is comprised of 1651 service connections and 216 hydrants. All service connections are metered.

1.6 Classification and Certification:

As per the Manitoba Environment's Water and Wastewater Facility Operator's Regulation, under the Environment Act, the Town of Swan River's water treatment and distribution system is classified as a;

- Class 2 Water Treatment Facility
- Class 2 Water Distribution System
- Certification level of operators:
  - Paul Klein, Class 2 – Operator in Charge
  - Jordan Rooks, Class 2 – Relief Operator

2. Disinfection of Water:

The final step in the treatment of safe water is disinfection, which is the selective destruction or inactivation of potential disease causing organisms in water. As per the Drinking Water Safety Act the Swan River 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 Systems Used:

The Swan River WTP disinfects using ultraviolet light (>95% of monthly water produced, dosed at >40mJ/cm2) and the addition of gaseous chlorine to water via a chlorinator injection system.

2.2 Equipment Redundancy and Monitoring Requirements:

As required by the Drinking Water Safety Act the Swan River PWS ensures continuous disinfection is maintained at the plant by keeping in stock all spare parts required for the chlorinator as well as bulbs and ballasts for the ultraviolet (UV) light disinfection system. Disinfection residuals are monitored daily at the water treatment plant and periodically in the distribution system and recorded on the appropriate monitoring forms. Monthly chlorination and UV 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 Swan River 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.

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 concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The 2023 results for the Swan River Public Water System are summarized in the following table:

Source	Parameter	Standard	Frequency	Test	Results
				Raw Water	Treated Water
Groundwater	TC & EC*	No TC or EC	Bi-weekly	100% passed	100% passed
	Disinfectant Chlorine	WTP (>0.5 mg/L)	Daily	NA	100% compliance
		Distribution (>0.1 mg/L)	Periodically	NA	100% compliance
	Ultraviolet	95% of water treated>40mJ/cm2	Daily	NA	100% compliance
	Manganese	0.12 mg/L	Annually	0.256 mg/L	0.00613 mg/L
	Lead	0.005 mg/L		<0.0000.50 mg/L	<0.050 mg/L
	Arsenic	0.01 mg/L		0.00073 mg/L	0.00022 mg/L
	Benzene	0.005 mg/L		<0.00050 mg/L	<0.00050 mg/L
	Ethylbenzene	0.14 mg/L		<0.00050 mg/L	<0.00050 mg/L
	Fluoride	1.5 mg/L		0.190 mg/L	0.484 mg/L
	Trichloro-ethylene	0.005 mg/L	Every 3 years	<0.00050 mg/L	<0.00050 mg/L
	Tetrachloro-ethylene	0.01 mg/L		<0.00050 mg/L	<0.00050 mg/L
	Toluene	0.06 mg/L		<0.00050 mg/L	<0.00050 mg/L
	Total Xylenes	0.09 mg/L		<0.00064 mg/L	<0.00064 mg/L
	Uranium	0.02 mg/L		0.00427 mg/L	0.00417 mg/L
	Nitrate	as nitrate: 45 mg/l		<0.0050 mg/L	0.0565 mg/L
	Nitrite	as nitrite: 3 mg/L		<0.0010 mg/L	<0.0010 mg/L

Bacterial Testing: The Town of Swan River is required by Manitoba Environment, to provide water samples every two weeks. The annual minimum total of samples required is 78. For the year 2023 the Town of Swan River submitted 107 samples.

Summary of Bacterial Testing for 2023:

Total number of submitted samples for 2023	107
Total negative tests	107
Percentage of negative tests	100%
Total positive test results on initial samples	0
Percentage of positive test results in initial samples	0%
Percentage of positive test on repeat samples	0% (Not Required)

4. Water System Failures and Corrective Actions:

In 2023, 4 water breaks occurred and were immediately repaired.

5. Additional Records Required:

As part of Manitoba Health's fluoridation program, water samples are collected on a daily basis from the clear well and tested on site. Daily fluoride results are recorded and a 14 day composite sample is submitted bi-weekly for analysis. The Swan River PWS strives to maintain a .60 mg/L to .70 mg/L fluoride level. The operating range for fluoride, as identified by Manitoba Health, is 0.50 – .90 mg/L.

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

In 2023, Drinking Water Safety Orders were issued for the Swan River Public Water System in association and accordance with the accompanying Boil Water Advisories as mentioned below. Orders were given to all residential and/or commercial facilities in the affected areas.

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

In 2023, there were 4 localized Boil Water Advisories issued for the Swan River Public Water System. These were issued due to intentional depressurization of a specific section of water main (via valve isolation), to repair either individual water service line breaks, breaks occuring on a water main line itself, or in order to perform a service connection.

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

In 2023, 1 warning was issued on the Swan River Public Water System regarding a temporary bypass line set up.

9. Major Expenses Incurred:

4 water breaks = $17,393.30