RIVERDALE MUNICIPALITY PUBLIC WATER SYSTEM ANNUAL REPORT - 2025

Riverdale Municipality strives to provide high quality drinking water in sufficient quantity to meet the needs of the public. It is our goal to do so in a safe, cost-effective manner while remaining in compliance with the regulatory requirements governing the provision of drinking water.
The operation of our water system is regulated in part by the Drinking Water Safety Act (MR40/2007), which came into force on March 1, 2007. Section 32(1) of the regulation stipulates that water systems serving 1,000 or more persons must prepare an annual report to its water users. Therefore, the following report has been prepared for the Town of Rivers water consumers.

Where does our water come from?

The Town of Rivers used water from four deep wells in the late 1940's but abandoned the wells when it bought the CNR dam on the Little Saskatchewan River south of town.
In 1991 the town began pumping water from Lake Wahtopanah, abandoning the reservoir at the river. This change has improved water quality thus reducing the cost of the treatment process.

How does the water get to our tap?

Source:

- Two 23 horse submersible pumps pump the raw water from Lake Wahtopanah to the water treatment plant through 2.5 kms of 250 mm C-900 PVC pipe.

Treatment:

- The raw water enters a pre-filter/strainer in the treatment facility that limits the quantity of larger particles entering the Membrane Filtration Units (MFU) and reduces the frequency of backwash cycles required to clean the units.
- After the pre-filters, the water goes through the MFU's. The MFU's consist of two sets of eight ultrafiltration (UF) modules each.
- Each UF module has hundreds of hollow straws (membranes) that the water is forced through.
- The water enters the module where pressure is applied to force water through the membranes. Most of the water passes out of the module through the inside of the membranes, while particles larger than the pore size of the membrane are rejected.
- This process removes bacteria, viruses, colloids, parasites such as Giardia and Cryptosporidium, and similar sized particles from the water.
- From the UF modules, the water is placed in a reservoir used to supply the Membrane Treatment Units (MTU). This reservoir is now being chlorinated to reduce biofouling in the RO membranes. Biofouling is biological growth that inhibits the flow of water through the membranes. As the water is pumped to the MTU's, Sodium Bisulfite is added to dechlorinate the water as chlorine will damage the membranes.
- The MTU's consist of two sets of four reverse osmosis (RO) modules and two Nano-filtration (NF) modules.

- The water from the UF reservoir is pumped to the modules where pressure is applied to the membranes, forcing the water through the membranes, leaving behind the small amount of water that will not pass through due to the dissolved substances that are too large for the membrane pore size, (concentrate).
- The concentrate is stored in a waste chamber where it is neutralized before being pumped out to the Little Saskatchewan River.
- The pure water (permeate) passes through the RO/NF membranes, removing dissolved contaminates such as salts and organics.

Distribution:

- The treated water is stored in a 1000m3/three chamber reservoir under the treatment facility.
- Chlorine is injected as the treated water enters the reservoir. This allows the chlorine adequate contact time to maintain the required residual.
- Treated water is pumped to the distribution system by 4-25 hp pumps which alternate between cycles and during low demand periods, a 7.5 hp "Jockey pump" is used.
- The distribution system pressure is currently set at 45 psi. (Pounds per square inch).
- The distribution piping is comprised of 9.3 km of 150mm Transite water main and ¾ inch to 2-inch service connections. There are currently a total of 537 services which are all metered.
- An on-site backup generator at the treatment facility is used to run the distribution pumps in the event of a power outage.

What chemicals are used in the treatment of our water?

The clarity of surface water changes each season and is dependent on the weather (amount of precipitation, temperature, spring runoff, etc.). As the water changes, adjustments are made to the process to ensure the best possible finished water. The following is a list of the chemicals we currently use and a brief description of their function.

Anti-Scalant – Fed into the feed water of the MTU to control scaling of the membranes.
Sodium Hydroxide – Used for high PH cleanings on the UF's and fed into the permeate water of the MTU for PH adjustment.
Hydrochloric Acid - Used for low PH cleanings on the UF's and caustic neutralization.
Sodium Hypochlorite – Used in the UF membrane cleaning process. Also, an adequate amount of chlorine is added before the water enters the storage reservoir to provide a disinfectant residual throughout the distribution piping.
Corrosion Inhibitor – A liquid inhibitor formulated to control corrosion in our distribution lines.
Sodium Bisulphite- Injected into the MTU feed lines to dechlorinate the feed water and to dechlorinate CIP (clean in place) and CEB (chemically enhanced backwash) water in the UF's.

Is our water tested? What for? When?

Water tests are taken on a routine basis to ensure that the water is safe and to monitor how well the treatment process is working. We test the water at the water treatment facility every day. We also test the water in the distribution system, as well as the raw water regularly. It is a regulatory

requirement that all water test results associated with water safety be submitted to the provincial Office of Drinking Water for review.

Disinfectant Testing: On- line chlorine analyzers in the treatment process continuously monitor the level of chlorine in the treated water, in addition to manual chlorine tests done by the operator several times per day to ensure that the water leaving the water treatment plant has enough chlorine to ensure proper disinfection throughout the system. We also test chlorine levels in the distribution system every time we take water samples for bacterial testing.
Turbidity Testing: Turbidity is defined as the cloudiness of a fluid caused by individual particles. Turbidity testing is a measurement of the clarity of water. We use turbidity to tell us how well our treatment process is working and to adjust our chemical feed rates throughout the year as the water changes. Five on- line turbidity analyzers continuously monitor the water as it goes through the treatment process, in addition to daily manual turbidity testing done by the operator.
Bacterial Testing: We test the raw water (untreated lake water), the treated water (leaving the water treatment plant) and the water in the distribution system at two locations every two weeks (bi-weekly) for the presences of Total Coliform and E. coli bacteria. If these bacteria are present in the water, it is an indication that disease-causing organisms may be present. If the laboratory results are positive, we resample and test again. If the results are still positive, a boil water advisory may be issued to the town at which time the public would be notified by the various media.
Trihalomethane (THM)/Haloacetic Acid (HAA) Testing: Trihalomethanes (THMs) and Haloacetic Acid (HAA) are by-products of the water treatment process. They are formed when natural organic material, such as the decaying vegetation commonly found in lakes and reservoirs, reacts with chlorine used to treat the water. This reaction produces "disinfection by-products," the most common of which are THMs and HAA's. Sampling is done four times per year, every second year, and the standard is based on these tests.
Chemical Testing: We test the raw and treated water for 60 chemical parameters on an annual basis. Sampling was completed in October 21/25 Testing indicated that the treated water met all health and aesthetic guidelines. A copy of the chemical analysis report can be obtained from the Municipal office.
Microcystin Testing: During the summer months, we do visual inspections for algae near the raw water intake. If an algae bloom is present, we test for microcystin toxins every three days until the bloom has passed. In 2025, no microcystin was detected in the raw water.
Lead Testing: Lead testing in the distribution system was completed for 2025. 20 samples were collected at varying residences throughout the year. Test results indicated no results above the standard limit in all samples.

What are the results of the tests?

The following list summarizes all the treated water test results for 2025:

Table 1. Treated Water Test Results and Standards

Testing Parameter	Standard	Frequency	Test Results
Bacterial	0-TC*, 0-EC*	Bi-weekly	100% Compliance
Chlorine (leaving reservoir)	0.5mg/L	Continuous	100 % Compliance

Chlorine (in town)	0.1mg/L	Bi-weekly	100% Compliance
Turbidity	<0.1 NTU	Continuous	100% Compliance
THM (Trihalomethanes)	(not required for 2025)	Quarterly	
HAA (Haloacetic Acids)	(Not required for 2025)	Quarterly	
Microbial	3 LRV*	Daily	100% Compliance

How do we alert Public Utilities Staff to water emergencies?

The new Water Treatment Plant utilizes a SCADA program. SCADA is an acronym for Supervisory Control and Data Acquisition. SCADA generally refers to an industrial computer system that monitors and controls all the processes in the plant and through an alarm system alert Utilities Staff to any emergencies that might affect the town's water supply. There is an operator on call 24 hours a day, 7 days a week. The operator is always available via cell phone.

Were there any emergencies, regulatory compliance issues or other operational issues to report in 2025?

NO

Future system expansion or expenses expected?

Installing a bulk water station

Who can we call with questions or concerns regarding our drinking water?

For general questions during regular business hours, call the Riverdale Municipality Office from 8:30 am to 4:30 pm at 204-328-5300 or the Water Treatment Plant at 204-710-7000.

For after hour's emergencies Call 204-573-7841

Attached is a list of all chemical water quality standards that apply to the water system, microsystin test results and a summary of analysis results for each parameter before and after treatment.