# Annual Report

## Balmertown, Cochenour & McKenzie Island Drinking Water System

# 2024

Prepared by **Northern Waterworks Inc.**
on behalf of the **Municipality of Red Lake**

NORTHERN WATERWORKS INC.

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# Contents

# 1 Introduction

## 1.1 Annual Reporting Requirements

This consolidated Annual Report (the Report) has been prepared in accordance with both section 11 (Annual Reports) and Schedule 22 (Summary Reports for Municipalities) of Ontario Regulation 170/03 (Drinking Water Systems Regulation). This Report is intended to inform both the public and Municipal Council about the operation of the system over the previous calendar year (January 1 to December 31, 2024).

Section 11 of O. Reg. 170/03 requires the development and distribution to the public of an annual report summarizing water quality monitoring results, adverse water quality incidents, system expenses and chemicals used in the water treatment process.

Schedule 22 of O. Reg. 170/03 requires the development and distribution to Council of an annual report summarizing incidents of regulatory non-compliance and associated corrective actions, in addition to providing flow monitoring results for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned demand.

## 1.2 Report Availability

In accordance with section 11 of O. Reg. 170/03, this Report must be given, without charge, to every person who requests a copy. Effective steps must also be taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained. This Annual Report shall be made available for inspection by the public at the Red Lake Municipal Office and on the Municipality's website.

In accordance with Schedule 22 of O. Reg. 170/03, this Report must be given to the members of Municipal Council. Section 19 (Standard of care, municipal drinking-water system) of Ontario's *Safe Drinking Water Act* (SDWA) also places certain responsibilities upon those municipal officials who oversee an accredited operating authority or exercise decision-making authority over a system. The examination of this Report is one of the methods by which municipal officials may fulfil the obligations required by section 19 of the SDWA.

System users and members of Council should contact a representative of NWI for assistance in interpreting this Report. Questions and comments may be directed to the local NWI Operations Manager or by email to compliance@nwi.ca.

# 2 System Overview & Expenses

## 2.1 System Description

The Balmertown, Cochenour & McKenzie Island (BCMI) Drinking Water System must meet extensive treatment and testing requirements to ensure that human health is protected. The operation and maintenance of the system is governed by Ontario's *Safe Drinking Water Act* and the regulations therein, in addition to requirements within system-specific environmental approvals. Important system information is summarized in Table 1.

**Table 1:** System information

| | |
|---|---|
| Drinking-Water System Name: | Balmertown, Cochenour & McKenzie Island (BCMI) Drinking Water System |
| DWS Number: | 210000522 |
| DWS Category: | Large Municipal Residential |
| DWS Owner: | The Corporation of the Municipality of Red Lake |
| DWS Operating Authority: | Northern Waterworks Inc. |
| DWS Components: | • Raw water pumping station<br>• Cochenour Water Treatment Plant<br>• Balmertown Reservoir Pumping Station<br>• Cochenour & McKenzie Island water distribution system<br>• Balmertown water distribution system |
| Treatment Processes: | • Chemical coagulation, flocculation and clarification<br>• Dual media (rapid sand) filtration<br>• Free chlorine disinfection<br>• pH adjustment |

Water production begins as raw water flows by gravity from the intake structure located in Bruce Channel (Red Lake) and into an underground reservoir located at the raw water pumping station. Pumps at the station transfer water from the reservoir and through a transmission line directly to the treatment units at the Cochenour Water Treatment Plant. Aluminum sulphate (coagulant) and sodium carbonate solution (pH/alkalinity adjustment) are injected and rapidly mixed into the raw water immediately upstream from the three package treatment units, which each include a two-stage flocculation tank, clarifier and filter.

To promote floc formation water is gently mixed as it passes through the flocculation basins. Polymer solution (flocculant) is also added to the water at this stage of treatment to form larger and more stable floc aggregates. Process water then enters the clarifier where its velocity is reduced to allow for the separation and settling of floc. Supernatant overflows into the clarifier effluent launders and is directed to the filter unit; settled floc (sludge) is automatically removed from the bottom of the clarifier.

Impurities that were not captured and settled as floc in the clarifier are removed by passing water through a dual media filter composed of anthracite and silica sand. Chlorine gas (disinfectant) and sodium carbonate solution are added to the filtrate as it is directed from the filters to the treated water storage reservoir. The filters are periodically cleaned by using an air scour to agitate the entire media bed and reversing the flow of water through the filter.

A majority of the water produced is transferred through a transmission line from the Cochenour Water Treatment Plant (WTP) to the reservoir at the Balmertown Reservoir Pumping Station (RPS). Primary disinfection is achieved as disinfectant mixes with the water in the reservoirs at both facilities. Pumps located at the Balmertown RPS and Cochenour WTP then transfer treated water from the facility reservoirs to the Balmertown and Cochenour/McKenzie Island water distribution systems, respectively. Secondary disinfection requirements in the distribution systems are achieved by maintaining a free chlorine residual at all locations.

## 2.2 Water Treatment Chemicals

In accordance with section 11 of O. Reg. 170/03, this Report must include a list of all water treatment chemicals used by the system during the period covered by the report (summarized in Table 2). All chemicals used in the treatment process are NSF/ANSI 60 certified for use in potable water, as required by system approvals.

Table 2: Water treatment chemicals used in 2024

| Treatment Chemical | Application |
|---|---|
| aluminum sulphate | coagulant |
| sodium carbonate | pH/alkalinity adjustment |
| polymer (Polyfloc CP1160P) | flocculant |
| chlorine gas | disinfectant |

## 2.3 System Expenses

In accordance with section 11 of O. Reg. 170/03, this Report must describe any major expenses incurred during the reporting period to install, repair, or replace required equipment. This Report also summarizes those expenses related to strengthening equipment inventories and to maintenance activities undertaken by subcontracted service providers. Major expenses incurred in 2024 are summarized in Table 3.

**Table 3:** Major expenses incurred in 2024

| Category | Description | Expense |
|---|---|---|
| Maintenance/Repairs | CWTP HLP 402 & 404 VFD's | $11,770 |
| Maintenance | CWTP HLP 403 & 803 Wet end repairs | $5,800 |
| Maintenance | Flow meter calibration verifications | $2,000 |
| Repairs | CWTP Reservoir piping repairs | $21,387 |

# 3 Water Quality

## 3.1 Overview

Water quality monitoring is conducted to determine and confirm that drinking water delivered to the consumer is safe and aesthetically pleasing. Monitoring is also required to assess compliance with legislation and to control the treatment process. In accordance with section 11 of O. Reg. 170/03, this Report must summarize the results of water quality tests required by regulations, approvals, and orders. The following sections summarize the results of all required water quality tests and compare the results to applicable water quality standards.

## 3.2 Microbiological Parameters

Microbiological sampling and testing requirements are provided in Schedule 10 (Microbiological sampling and testing) of O. Reg. 170/03. In 2024, a total of 300 routine source, treated and distribution water samples were collected for microbiological analysis by an accredited laboratory. Samples were collected on a weekly basis and included tests for E. coli (EC), total coliforms (TC) and heterotrophic plate counts (HPC). Results from microbiological analyses are summarized in Table 4. All results were below the associated Ontario Drinking Water Quality Standards.

**Table 4:** Results summary for microbiological parameters

| Sample Type | # of Samples | EC Results Range[1] (MPN/ 100mL) | TC Results Range[1] (MPN/ 100mL) | # of HPC Samples | HPC Results Range (CFU/mL) |
|---|---|---|---|---|---|
| Raw Water | 52 | 0 to 2 | 0 to 179 | --- | --- |
| Treated Water (CWTP) | 86[2] | absent | absent | 52 | 0 to 1 |
| Balmertown (BRPS) | 55 | absent | absent | 52 | 0 to 1 |
| Distribution (routine) | 149 | absent | absent | 38 | 0 to 8 |
| Distribution (nonroutine) | 2 | absent | absent | --- | --- |

1. The Ontario Drinking Water Quality Standard for E. Coli and Total Coliforms in a treated or distribution sample is 'not detectable'. The presence of either parameter in a treated or distribution sample constitutes an exceedance.
2. Twenty-Two (22) Treated Water (CWTP) samples were to meet sampling requirements surrounding the piping repairs completed in the Cochenour Reservoirs.

## 3.3 Operational Parameters

In accordance with Schedule 7 (Operational checks) of O. Reg. 170/03, regulated operational parameters that must be monitored include raw water turbidity, filtrate turbidity and the free chlorine residuals associated with primary and secondary disinfection. Table 5 summarizes water quality results for regulated and selected unregulated operational parameters. In accordance with Schedule 6 (Operational checks, sampling, and testing – general) of O. Reg. 170/03, certain operational parameters are continuously monitored. No Adverse Water Quality Incidents (AWQIs) pertaining to operational parameters occurred during the reporting period.

**Table 5:** Results summary for operational parameters

| Parameter (Sample Type)[1] | Number of Samples | Units | Min. Result | Max. Result | Annual Avg. | Adverse Result |
|---|---|---|---|---|---|---|
| Turbidity (Raw Water) | 79 | NTU | 0.33 | 2.03 | 0.97 | n/a |
| Turbidity (Filter 1) | Continuous | NTU | 0.018 | 0.158 | 0.052 | >1.0 |
| Turbidity (Filter 2) | Continuous | NTU | 0.031 | 0.200 | 0.051 | >1.0 |
| Turbidity (Filter 3) | Continuous | NTU | 0.023 | 0.120 | 0.062 | >1.0 |
| Turbidity (Treated) | 365 | NTU | 0.06 | 0.81 | 0.15 | n/a |
| pH (Treated) | 365 | --- | 7.0 | 7.83 | 7.37 | n/a |
| Alkalinity (Treated) | 243 | mg/L | 41 | 63.3 | 49.4 | n/a |
| Aluminum Residual (Treated) | 244 | mg/L | 0.015 | 0.051 | 0.029 | n/a |
| FCR (Treated - CWTP)[2] | Continuous | mg/L | 1.17 | 2.20 | 1.66 | n/a |
| FCR (Treated - BRPS)[2] | Continuous | mg/L | 0.91 | 1.98 | 1.43 | n/a |
| FCR (CMI Distribution)[3] | 350+ | mg/L | 0.55 | 1.92 | n/a | <0.05 |
| FCR (Balm. Distribution)[3] | 400+ | mg/L | 0.91 | 1.98 | n/a | <0.05 |

1. FCR = free chlorine residual; CMI = Cochenour & McKenzie Island; Balm. = Balmertown.
2. There is no adverse result corresponding to the treated water free chlorine residual. However, an observation of adverse water quality occurs if the residual is low enough such that water has not been disinfected in accordance with the system's *Municipal Drinking Water Licence*.
3. Free chlorine residuals are tested at various locations in the distribution systems. The free chlorine residual varies with water age and distribution system location, and the values in the table pertain to the minimum and maximum results collected across all locations in the calendar year.

## 3.4 Conventional Filtration Performance

In accordance with the system's *Municipal Drinking Water Licence*, conventional filtration facilities must meet certain performance criteria in order to claim removal credits for Cryptosporidium oocysts and Giardia cysts. In addition to continuously monitoring filtrate turbidity and other requirements, filtrate turbidity must be less than or equal to 0.3 NTU in at least 95% of the measurements each month. Table 6 summarizes filtrate turbidity compliance against the <0.3 NTU/95% performance criterion. Minimum and maximum values in the table correspond to the proportion of time that filtered water turbidity was less than or equal to 0.3 NTU in a calendar month in 2024. No AWQIs related to conventional filtration performance occurred during the reporting period.

Table 6: Filtration performance summary

| Filter | Minimum Result | Maximum Result | Adverse Result |
|---|---|---|---|
| Filter 1 | 99.9% | 100% | <95% |
| Filter 2 | 99.9% | 100% | <95% |
| Filter 3 | 99.9% | 100% | <95% |

## 3.5 Nitrate & Nitrite

Treated water is tested for nitrate and nitrite concentrations on a quarterly basis in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Nitrate and nitrite results are provided in Table 7. All results were below the Ontario Drinking Water Quality Standards.

**Table 7:** Nitrate and nitrite results

| Sample Date | Nitrate | | Nitrite | |
|---|---|---|---|---|
| | Result (mg/L) | ODWQS (mg/L) | Result (mg/L) | ODWQS (mg/L) |
| 12-Feb-2024 | 0.097 | 10 | <0.010 | 1 |
| 13-May-2024 | 0.052 | | <0.010 | |
| 15-Aug-2024 | 0.035 | | <0.010 | |
| 18-Nov-2024 | 0.045 | | <0.010 | |

## 3.6 Trihalomethanes & Haloacetic Acids

Trihalomethanes (THMs) and haloacetic acids (HAAs) are sampled on a quarterly basis from a distribution system location that is likely to have an elevated potential for their formation, in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Total THM and HAA results are provided in Table 8 and Table 9, respectively. Compliance with the provincial standards for THM and HAA concentrations is determined by calculating a running annual average (RAA) each quarter. The 2024 RAAs for THMs were below the Ontario Drinking Water Quality Standards.

**Table 8:** Total THM results

| Sample Date | Result (µg/L) | Quarterly Average (µg/L) |
|---|---|---|
| 12-Feb-24 | 61.7 | 61.7 |
| Q1 Regulatory Average (RAA) | | 75.1 |
| 15-May-23 | 64.1 | 64.1 |
| Q2 Regulatory Average (RAA) | | 74.5 |
| 15-Aug-24 | 101 | 101 |
| Q3 Regulatory Average (RAA) | | 76.2 |
| 11-Nov-24 | 94.0 | 94.0 |
| Q4 Regulatory Average (RAA) | | 80.2 |
| ODWQS (RAA) | | 100 |

Zero (0) AWQIs were reported for an HAA exceedance in 2024. Samples were taken monthly instead of quarterly throughout 2024 to continue to monitor the levels more closely after ongoing AWQIs were resolved at the end of Q4 2023. Monthly HAA sampling will continue in 2025 and may return to quarterly sampling in 2026 if there are no further exceedances.

Table 9: Total HAA results

| Sample Date | Result (µg/L) | Quarterly Average Result (µg/L) |
|---|---|---|
| 8-Jan-24 | 61.5 | 63.5 |
| 12-Feb-24 | 65.5 | |
| Q1 Regulatory Average (RAA) | | 74.8 |
| 15-Apr-24 | 65.5 | 64.8 |
| 6-May-24 | 69.2 | |
| 13-May-24 | 60.0 | |
| 10-Jun-24 | 83.1 | |
| Q2 Regulatory Average (RAA) | | 70.7 |
| 15-Jul-24 | 74.1 | 82.0 |
| 15-Aug-24 | 79.4 | |
| 15-Sep-24 | 92.6 | |
| Q3 Regulatory Average (RAA) | | 69.2 |
| 15-Oct-24 | 79.5 | 69.5 |
| 11-Nov-24 | 71.0 | |
| 23-Dec-24 | 52.8 | |
| Q4 Regulatory Average (RAA) | | 67.8 |
| ODWQS (RAA) | | 80 |

## 3.7 Lead Sampling

Based upon favourable sampling results in the community, the BCMI DWS previously qualified for reduced lead sampling and ultimately became exempt from sampling at plumbing locations in accordance with Schedule 15.1 (Lead) of O. Reg. 170/03. Two (2) distribution system samples must now be collected and analyzed for pH and alkalinity during the two lead sampling periods. Additionally, these distribution system samples must be analyzed for lead in every third 12-month period after the plumbing sample exemption was activated. Table 10 summarizes the results of community lead sampling and related required tests.

Table 10: Distribution pH, alkalinity, and lead sampling results

| Sample Date | Distribution Sampling Location | pH | Alkalinity (mg/L) | Lead Result[1] (µg/L) | Lead ODWQS (µg/L) |
|---|---|---|---|---|---|
| 8-Apr-2024 | Cochenour Crescent Valve | 7.53 | 45.7 | <1.0 | 10 |
| 8-Apr-2024 | Cochenour Crescent Valve | 7.53 | 45.7 | <1.0 | |
| 8-Apr-2024 | Balmertown Waste Plant | 7.39 | 44.8 | 2.3 | |
| 8-Apr-2024 | Balmertown Waste Plant | 7.39 | 44.8 | 1.7 | |
| 12-Sep-2024 | Cochenour Crescent Valve | 7.42 | 45.8 | <1.0 | 10 |
| 12-Sep-2024 | Cochenour Crescent Valve | 7.42 | 45.8 | <1.0 | |
| 12-Sep-2024 | Balmertown WPCP Hydrant | 7.3 | 45.2 | <1.0 | |
| 12-Sep-2024 | Balmertown WPCP Hydrant | 7.3 | 45.2 | <1.0 | |

1. Lead will next be tested in distribution samples during the Winter 2026/27 sampling period.

## 3.8 Environmental Discharge Sampling

The *Municipal Drinking Water Licence* for the BCMI Drinking Water System requires additional sampling associated with discharges to the natural environment. Specifically, samples must be collected from settling tank effluent on a monthly basis and tested for the parameter total suspended solids (TSS). This effluent is discharged to Bruce Channel and originates from the onsite treatment of the wastewater produced during plant operation. The *Licence* also requires that the effluent discharged to the environment has an annual average TSS concentration below 25 mg/L. Table 11 summarizes 2024 environmental discharge sampling results.

**Table 11:** Environmental discharge sampling results summary

| Number of Samples | Minimum TSS Result (mg/L) | Maximum TSS Result (mg/L) | TSS Annual Average (mg/L) |
|---|---|---|---|
| 12 | <3.0 | 11.3 | 7.71 |

## 3.9 Inorganic & Organic Parameters

Most inorganic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 23 (Inorganic parameters) of O. Reg. 170/03. The inorganic parameters sodium and fluoride are sampled every five (5) years in treated water in accordance with Schedules 13 and 23 of O. Reg. 170/03. The most recent inorganic parameter sampling results are provided in Table 12. All results were below the associated Ontario Drinking Water Quality Standards.

Table 12: Inorganic parameter sampling results

| Parameter | Most Recent Sample Date | Units | Result | ODWQS |
|---|---|---|---|---|
| Antimony | 15-Aug-2024 | µg/L | <0.60 | 6 |
| Arsenic | 15-Aug-2024 | µg/L | <1.0 | 10 |
| Barium | 15-Aug-2024 | µg/L | <10 | 1000 |
| Boron | 15-Aug-2024 | µg/L | <50 | 5000 |
| Cadmium | 15-Aug-2024 | µg/L | <0.10 | 5 |
| Chromium | 15-Aug-2024 | µg/L | <1.0 | 50 |
| Fluoride | 13-Feb-2023 | mg/L | <0.020 | 1.5 |
| Mercury | 15-Aug-2024 | µg/L | <0.100 | 1 |
| Selenium | 15-Aug-2024 | µg/L | <1.0 | 50 |
| Sodium | 13-Feb-2023 | mg/L | 24.3[1] | 20 |
| Uranium | 15-Aug-2024 | µg/L | <2.0 | 20 |

1. The parameter sodium is not considered a toxic element and is not associated with a Standard as prescribed in O. Reg. 169/03, although an exceedance of 20 mg/L requires reporting and corrective actions. The result in the table was reported as an Adverse Water Quality Incident. See the *Compliance* section of the 2023 annual report for more information.

Organic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 24 (Organic parameters) of O. Reg. 170/03. These parameters include various organic acids, pesticides, herbicides, PCBs, volatile organics, and other chemicals. Sampling for all organic parameters was conducted on August 15, 2024, and results are provided in Table 13. All results were below the associated Ontario Drinking Water Quality Standards.

**Table 13:** Organic parameter sampling results

| Parameter | Result (µg/L) | ODWQS (µg/L) | Parameter | Result (µg/L) | ODWQS (µg/L) |
|---|---|---|---|---|---|
| Alachlor | <0.050 | 5 | Diuron | <0.050 | 150 |
| Atrazine & Metabolites | <0.14 | 5 | Glyphosate | <0.20 | 280 |
| Azinphos-methyl | <0.100 | 20 | Malathion | <0.0250 | 190 |
| Benzene | <0.50 | 1 | MCPA | <0.00005 | 100 |
| Benzo(a)pyrene | <0.005 | 0.01 | Metolachlor | <0.0250 | 50 |
| Bromoxynil | <0.250 | 5 | Metribuzin | <0.100 | 80 |
| Carbaryl | <0.050 | 90 | Monochlorobenzene | <0.50 | 80 |
| Carbofuran | <0.0250 | 90 | Paraquat | <1.0 | 10 |
| Carbon Tetrachloride | <0.20 | 2 | Pentachlorophenol | <0.50 | 60 |
| Chlorpyrifos | <0.10 | 90 | Phorate | <0.250 | 2 |
| Diazinon | <0.0250 | 20 | Picloram | <0.50 | 190 |
| Dicamba | <0.10 | 120 | Total PCBs | <0.030 | 3 |
| 1,2-Dichlorobenzene | <0.50 | 200 | Prometryne | <0.0250 | 1 |
| 1,4-Dichlorobenzene | <0.50 | 5 | Simazine | <0.100 | 10 |
| 1,2-Dichloroethane | <0.50 | 5 | Terbufos | <0.100 | 1 |
| 1,1-Dichloroethylene | <0.50 | 14 | Tetrachloroethylene | <0.50 | 10 |
| Dichloromethane | <1.0 | 50 | 2,3,4,6-Tetrachlorophenol | <0.50 | 100 |
| 2,4-Dichlorophenol | <0.20 | 900 | Triallate | <0.100 | 230 |
| 2,4-D | <0.050 | 100 | Trichloroethylene | <0.50 | 5 |
| Diclofop-methyl | <0.100 | 9 | 2,4,6-Trichlorophenol | <0.20 | 5 |
| Dimethoate | <0.050 | 20 | Trifluralin | <0.10 | 45 |
| Diquat | <1.0 | 70 | Vinyl Chloride | <0.50 | 1 |

## 3.10 Harmful Algal Bloom Monitoring

Starting in 2022 a requirement was added to the Municipal Drinking Water License to monitor for Harmful Algae Blooms. If a bloom is identified or suspected, then microcystin testing must be undertaken. According to the HAB plan sampling must continue for three (3) weeks of no microcystin identified. There were zero (0) reported or suspected blooms during the standard monitoring period in 2024.

There were also no suspected or occurring HABs outside the standard period of June 1 to October 31. Historic sample results have consistently identified no microcystin in raw or treated water when algal blooms are observed. Table 14 provides a summary of suspected or occurring HABs in Hudson since monitoring began.

**Table 14:** Recent historical algal bloom summary

| Year | Suspected | Harmful Algal Blooms |
|---|---|---|
| 2022 | 0 | 0 |
| 2023 | 0 | 0 |
| 2024 | 0 | 0 |

# 4 Water Production

## 4.1 Overview

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Annual Report must include certain information for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned uses. Specifically, this Report must include a summary of the quantities and flow rates of the water supplied during the reporting period, including monthly average and maximum daily flows. The Report must also include a comparison of flow monitoring results to the rated capacity and flow rates approved in the system's *Municipal Drinking Water Licence*.

## 4.2 Flow Monitoring Results

Throughout the reporting period the BCMI DWS operated within its rated capacity and supplied a total of 280,432 $m^3$ of treated water. On an average day in 2024, 766 $m^3$ of treated water was supplied to the communities of Balmertown, Cochenour & McKenzie Island, which represents 13% of the rated capacity of the Cochenour Water Treatment Plant (6,065 $m^3$/day). The maximum daily flow in 2024 was 1,419 $m^3$/day, which represents 23% of the rated capacity of the treatment facility. Flow monitoring results are summarized in Figure 1 and Table 15. The capacity assessments provided in the table compare the average and maximum daily treated water flows to the rated capacity of the treatment facility.

Figure 1: 2024 average and maximum daily treated water flows

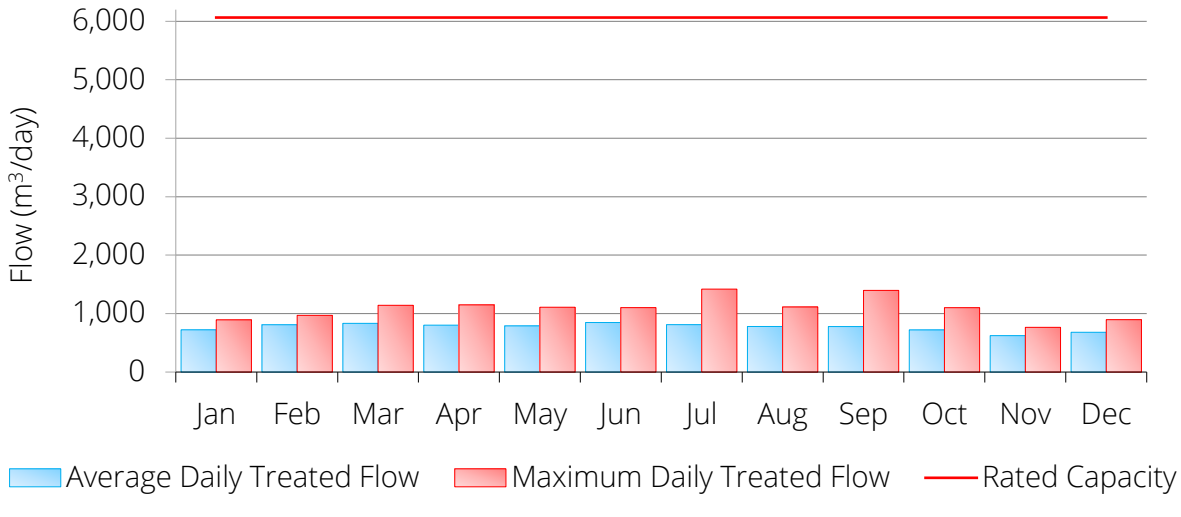


Table 15: 2024 water production summary

| Month | Total Volumes ($m^3$) | | Daily Flows ($m^3$/day) | | Capacity Assessments | |
|---|---|---|---|---|---|---|
| | Raw Water | Treated Water | Average - Treated | Maximum - Treated | Average - Treated | Maximum - Treated |
| Jan | 26,892 | 22,392 | 722 | 893 | 12% | 15% |
| Feb | 28,126 | 23,471 | 809 | 970 | 13% | 16% |
| Mar | 31,396 | 25,829 | 833 | 1,142 | 14% | 19% |
| Apr | 29,116 | 24,073 | 802 | 1,149 | 13% | 19% |
| May | 29,342 | 24,479 | 790 | 1,109 | 13% | 18% |
| Jun | 31,152 | 25,422 | 847 | 1,102 | 14% | 18% |
| Jul | 30,488 | 25,134 | 811 | 1,419 | 13% | 23% |
| Aug | 28,298 | 24,162 | 779 | 1,113 | 13% | 18% |
| Sep | 27,502 | 23,351 | 778 | 1,397 | 13% | 23% |
| Oct | 26,932 | 22,336 | 721 | 1,101 | 12% | 18% |
| Nov | 23,186 | 18,686 | 623 | 765 | 10% | 13% |
| Dec | 26,258 | 21,097 | 681 | 896 | 11% | 15% |
| Total | 338,688 | 280,432 | --- | MAX: | --- | --- |
| Average | 28,224 | 23,369 | 766 | 1,419 | 13% | 18% |

Over the reporting period, 75% (213,288) of the total amount of treated water produced was distributed to the community of Balmertown, with the remaining 25% (71,632 $m^3$) being distributed to the communities of Cochenour and McKenzie Island. On an average day in 2024, 584 $m^3$ of treated water was supplied to Balmertown and 196 $m^3$ was supplied to Cochenour & McKenzie Island. Table 16 provides a summary of flow monitoring results organized by the respective water distribution systems.

**Table 16:** 2024 water production summary – results by water distribution system

| Month | Balmertown | | | Cochenour & McKenzie Island | | |
|---|---|---|---|---|---|---|
| | Total Volume ($m^3$) | Average Daily Flow ($m^3$/day) | Proportion of Total (%) | Total Volume ($m^3$) | Average Daily Flow ($m^3$/day) | Proportion of Total (%) |
| Jan | 15,937 | 514 | 70% | 6,744 | 218 | 30% |
| Feb | 17,236 | 594 | 73% | 6,496 | 224 | 27% |
| Mar | 19,261 | 621 | 73% | 6,963 | 225 | 27% |
| Apr | 17,706 | 590 | 73% | 6,582 | 219 | 27% |
| May | 18,371 | 593 | 73% | 6,831 | 220 | 27% |
| Jun | 19,107 | 637 | 74% | 6,592 | 220 | 26% |
| Jul | 19,342 | 624 | 76% | 6,010 | 194 | 24% |
| Aug | 19,231 | 620 | 78% | 5,344 | 172 | 22% |
| Sep | 17,559 | 585 | 74% | 6,067 | 202 | 26% |
| Oct | 17,482 | 564 | 76% | 5,552 | 179 | 24% |
| Nov | 15,239 | 508 | 79% | 4,096 | 137 | 21% |
| Dec | 16,817 | 561 | 79% | 4,355 | 140 | 21% |
| Total | 213,288 | --- | --- | 71,632 | --- | --- |
| Average | 17,774 | 584 | 75% | 5,969 | 196 | 25% |

## 4.3 Recent Historical Flows

Table 17 summarizes recent historical flow monitoring results for the BCMI DWS. There was a significant decrease in the volume of treated water supplied in 2024 when compared to the previous 15 years. This is likely attributed to the substantial repairs and improvement of the distribution system. Total annual volumes of treated water supplied in the upcoming year may be expected to be between 300,000 $m^3$ and 450,000 $m^3$, which represents approximately 14% to 20% of the rated capacity of the Cochenour Water Treatment Plant.

**Table 17:** Recent historical water production summary

| Year | Total Volumes ($m^3$) | | Daily Flows ($m^3$/day) | | Annual % Change | |
|---|---|---|---|---|---|---|
| | Raw Water | Treated Water | Average – Treated Water | Maximum – Treated Water | Raw Water | Treated Water |
| 2009 | 481,351 | 406,151 | 1,113 | 2,007 | -13.8% | -9.3% |
| 2010 | 515,274 | 424,549 | 1,163 | 2,232 | +7.0% | +4.5% |
| 2011 | 471,032 | 409,384 | 1,122 | 2,240 | -8.6% | -3.6% |
| 2012 | 439,530 | 389,828 | 1,065 | 2,007 | -6.7% | -4.8% |
| 2013 | 443,266 | 408,492 | 1,119 | 2,369 | +0.8% | +4.8% |
| 2014 | 412,234 | 360,120 | 987 | 2,061 | -7.0% | -11.8% |
| 2015 | 439,868 | 390,982 | 1,071 | 1,878 | +6.7% | +8.6% |
| 2016 | 419,949 | 337,245 | 921 | 1,557 | -4.5% | -13.7% |
| 2017 | 436,670 | 341,391 | 935 | 2,015 | +4.0% | +1.2% |
| 2018 | 425,326 | 358,995 | 984 | 1,947 | -2.6% | +5.2% |
| 2019 | 422,149 | 363,215 | 995 | 1,874 | -0.7% | +1.2% |
| 2020 | 473,891 | 386,712 | 1,057 | 2,009 | +12.3% | +6.5% |
| 2021 | 477,708 | 419,903 | 1,150 | 2,213 | +0.8% | +8.6% |
| 2022 | 438,660 | 376,897 | 1,033 | 2,201 | -8.2% | -10.2% |
| 2023 | 437,184 | 376,383 | 1,031 | 2,773 | -0.3% | -0.1% |
| 2024 | 338,688 | 280,432 | 768 | 1,419 | -22.5% | -25.5% |

# 5 Compliance

## 5.1 Overview

Northern Waterworks Inc. and the Municipality of Red Lake employ an operational strategy that is committed to achieving the following goals:

- Providing a safe and reliable supply of drinking water to the communities of Balmertown, Cochenour & McKenzie Island;
- Meeting or exceeding all applicable legislative and regulatory requirements; and,
- Maintaining and continually improving the operation and maintenance of the system.

The following sections will summarize incidents of adverse water quality and regulatory noncompliance that occurred during the reporting period. NWI is committed to employing timely and effective corrective actions to prevent the recurrence of identified incidents of adverse water quality and noncompliance.

## 5.2 Adverse Water Quality Incidents

In accordance with section 11 (Annual Reports) of O. Reg. 170/03, this Report must summarize any reports made to the Ministry under subsection 18(1) (Duty to report adverse test results) of *the Act* or section 16-4 (Duty to report other observations) of Schedule 16 of O. Reg. 170/03. Additionally, this Report must describe any corrective actions taken under Schedule 17 of O. Reg. 170/03 during the period covered by the report. The two (2) adverse water quality incidents that occurred during the reporting period are summarized below.

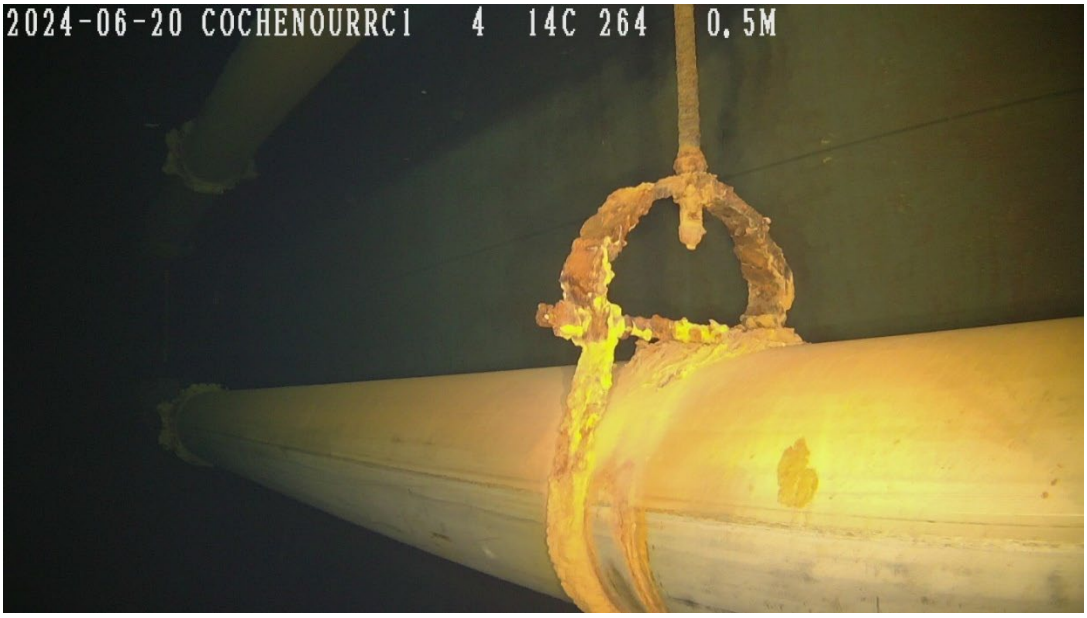
- AWQI 165265 (June 20, 2024) & AWQI 15291 (June 22, 2024)

On June 20, 2024, during ROV inspection of Reservoir #2 it was observed that the filter effluent infrastructure piping that directs water inside the reservoir was broken. This caused short circuiting of reservoir #2. Reservoir #2 was isolated from system and was to stay isolated until repairs and disinfection procedures could be completed. There were no additional corrective actions required by the Northwest Health Unit at the time.

On June 22, 2024 during repair efforts in Reservoir #2, it was observed that filter effluent infrastructure piping that directs water inside the reservoir was short circuiting between Reservoir #1 and #2. Reservoir #1 and #2 were no longer isolated. A self imposed Boil Water Advisory was issued to all residents of Balmertown, Cochenour, McKenzie Island and McMarmac and the ROV was again utilized for inspection of filter infrastructure effluent piping

in both reservoirs. It was observed that the filter effluent infrastructure piping that directs water inside reservoir #1was also broken.

NWI replaced all pipe hangers and clamps, added additional hangers and rehung effluent feed piping for reservoirs 1 & 2. The reservoir #1 isolation valve from reservoir 2 was repaired. The system was restored to normal operation and the boil water advisory was rescinded on July 5, 2024. There were no further corrective actions required by the Northwest Health Unit. A Notice of Issue Resolution was submitted to the Ministry on July 10, 2024.




## 5.3 Regulatory Compliance

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Report must list any requirements of the *Act*, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report (i.e., an incident of regulatory noncompliance). Additionally, this Report must specify the duration of the failure and the measures that were taken to correct the failure.

The most recent inspection by Ontario's Ministry of the Environment, Conservation and Parks was conducted on October 31, 2024, and the final report was received on December 4, 2024. The final inspection rating was 95.8%, and one (1) incident of noncompliance was identified.

- Noncompliance item no. 1

The requirement for treatment equipment to be operated in a manner that achieved the design capabilities required under O. Reg. 170/03 or a DWWP and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers was not met in one instance. For assessing the capability of a chemical disinfection system to provide effective pathogen inactivation, the CT concept was developed, which considers the combination of the concentration of the chemical disinfectant (C - in mg/L) and *the effective contact time* (T - in minutes) of the disinfectant in the water supply. The Procedure for Disinfection of Drinking Water in Ontario states that in order achieve primary disinfection, the calculated CT value must, at all times during plant operation, be equal to or greater than the required overall CT value to ensure the proper level of disinfection.. If CT is not met and that water is directed to the distribution system, it is deemed to be improper disinfection.

On June 20, 2024, NWI operators were performing a remotely operated vehicle (ROV) inspection in reservoir #2 at the Cochenour WTP and noticed that the piping that transmits flow from the filters to the head of reservoir #2 had disconnected from the flange on the reservoir wall. Because of the compromised piping connection, filtered water had been bypassing a significant portion of reservoir #2 and associated baffles. As a result, this water was not receiving adequate contact time to claim the required disinfection credits and the Cochenour WTP distributed improperly disinfected water to the Cochenour McKenzie Island portion of the distribution system for an unknown period of time. It is worth noting that microbiological sampling from the Cochenour WTP and from the Cochenour McKenzie Island distribution system shows that bacteria was not present during the inspection review period.


Upon discovery of the issue with reservoir #2, NWI immediately reported an observation of improper disinfection to the Ministry's Spill's Action Centre (SAC) and Northwestern Health Unit (NWHU) and isolated reservoir #2. Further inspection of the reservoirs also revealed that the piping hangers in reservoirs #1 and #2 had severely corroded and were at risk of imminent failure.

Over the proceeding 2 weeks, NWI operators worked to replace all affected piping hangers. These events highlight the importance of routine reservoir inspections. The Ministry highly recommends an established routine reservoir inspection schedule. The ROV reservoir inspection that resulted in the discovery of the piping failures was part of NWI's efforts to re-establish routine reservoir inspections and these inspections will continue on a biannual basis going forward. There are no further immediate corrective actions to be taken at this time.