



**Nanticoke Drinking Water System  
2023 Annual Water Quality Report**

**January 1, 2023 – December 31, 2023**

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# Quality Management System Policy

The Corporation of Haldimand County owns, maintains and operates various drinking water systems. Haldimand County is committed to:

- Ensuring our drinking water systems comply with all current legislation and regulatory requirements for the safe supply of drinking water;
- Ensuring financial support is provided to maintain infrastructure integrity to allow safe and consistent delivery of drinking water to our water customers;
- Reviewing, maintaining and continually improving our Quality Management System and to communicate the Plan with our water customers.



## Haldimand County Quality Management System Summary

Haldimand County's Quality Management System (QMS) is legislated under the Drinking Water Quality Management Standard (DWQMS) through the Safe Drinking Water Act. To maintain operating authority accreditation, the Ministry of the Environment, Conservation and Parks (MECP) mandate tasks that must be completed annually. These activities include:

- Conducting an internal audit of the Quality Management System.
- Conducting a Management Review meeting.
- Participating in an external audit conducting by a third-party Accreditation Body
- Updating the Quality Management System Operational Plan.
- Updating Council of the status of the County's Quality Management System.

The QMS Operational Plan was reviewed and updated in 2023, with focus on Document and Records Control (Element 5), conforming to the DWQMS standards and Continual Improvement (Element 21) all while incorporating organizational changes within the County.

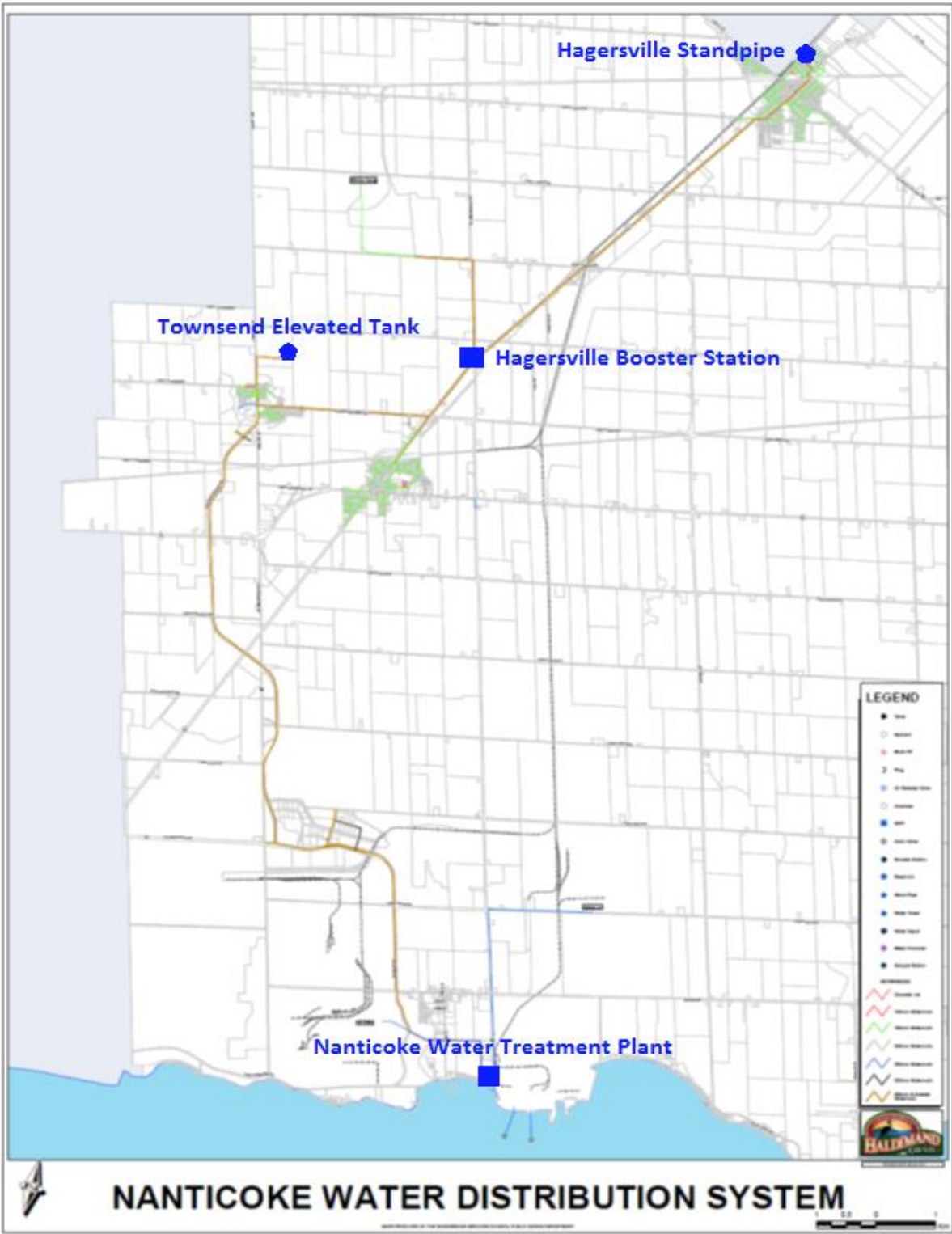
Internal audits were completed with support from Water and Wastewater Operations staff. Extra support from other County staff during internal audits would increase the coverage to ensure the system is conforming and efficient. No non-conformities were identified as a result of the internal audit. The audit report did note two areas for opportunities for improvement.

Haldimand County must receive accreditation annually to operate the water distribution systems. Through a qualified third-party auditor, the County must demonstrate that its QMS (Quality Management System) meets the requirements of the DWQMS (Drinking Water Quality Management Standard). SAI Global conducted an external audit on December 1<sup>st</sup>, 2022. The County received one minor non-conformance. This was a result of an administrative issue and corrective action was implemented immediately to resolve the issue. The reaccreditation audit is scheduled for February 28, 2024.

Staff are required to conduct an annual Management Review meeting to evaluate the effectiveness of the QMS. Deficiencies and opportunities for improvement are identified and action items are developed to ensure follow-up. The County held their management review meeting on November 3, 2023.

As part of the agreement with the County and through the regulations, Ontario Clean Water Agency (OCWA) must obtain accreditation to operate the water treatment facilities on behalf of the County. In 2023 OCWA continued full scope accreditation under the requirements of DWQMS.

# NANTICOKE DRINKING WATER SYSTEM



# Nanticoke Drinking Water System Overview

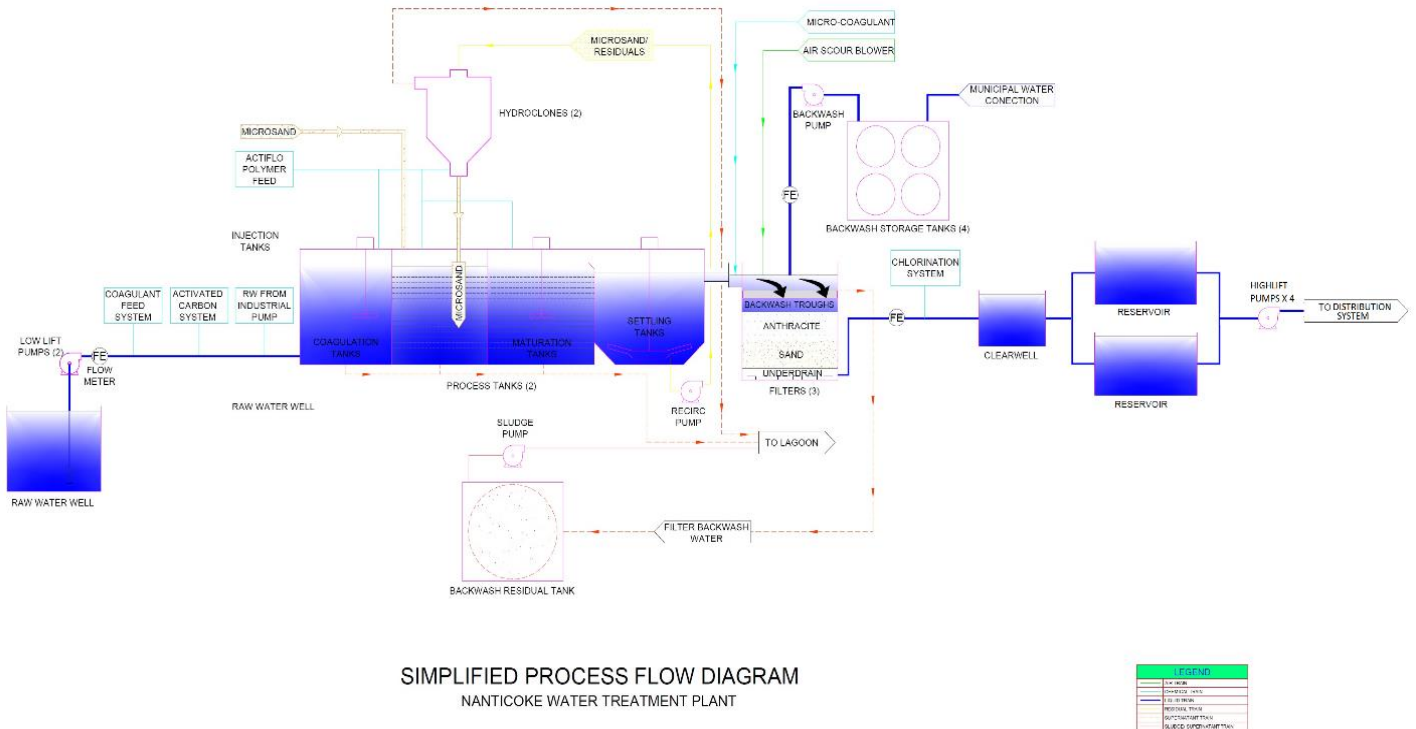
Lake Erie raw water flows from the Ontario Power Generation forebay into the Nanticoke Industrial Pumping Station forebay. Raw water can be pre-chlorinated for zebra mussel control and then drawn into two raw water wet wells. Seven vertical turbine pumps are capable of supplying Imperial Oil and US Steel plants with raw water. Two submersible pumps supply the municipal treatment works with raw water.

A coagulant (poly-aluminum chloride was used in 2023) is injected into the raw water supply. Water flows into a high-rate clarification process (Actiflo), which uses microsand and polymer to improve floc formation and significantly reduce settling times. Settled water then flows to three filter units containing sand and anthracite. Filtered water is chlorinated with sodium hypochlorite for primary disinfection prior to flowing to two reservoirs. These reservoirs feed into a high lift pumping station, where chlorine is injected for secondary disinfection, before being pumped into the distribution system.

A settling lagoon collects waste water from various water treatment plant processes and continuously discharges to Lake Erie.

Figure 1 is a simplified schematic of the Nanticoke Water Treatment Plant.

The distribution system is comprised of three residential communities (Townsend, Jarvis and Hagersville) and the Lake Erie Industrial Park. Townsend utilizes a water tower for storage and to maintain pressure in the distribution system. A booster station is utilized to maintain pressure and flow to Hagersville. As required, this facility has the capability to add sodium hypochlorite to the potable water to boost chlorine residuals. Hagersville utilizes a standpipe for storage and to maintain pressure in the distribution system. Bulk water stations are located in Hagersville and Jarvis. In addition, the Nanticoke Drinking Water System provides potable water to the Mississaugas of the Credit First Nation.



**Figure 1: Nanticoke Water Treatment Plant Schematic**

The distribution system infrastructure services approximately 5,200 people (2021 Census).

Ontario Clean Water Agency is contracted to operate and maintain the raw water transmission mains, low lift pumping station, water treatment plant, and the standpipe. Haldimand County operates and maintains the distribution system, including the bulk water depots.

### Expenditure Information

Haldimand County and its contract operators are diligent in prioritizing projects on an annual basis to eliminate unnecessary expenditure. Using the best available information at the time of this report, expenses incurred in the Nanticoke Drinking Water System for 2023 are identified in Table 1. Not all drinking water expenditure information is included in this report.

**Table 1: Nanticoke Drinking Water System 2023 Major Expenditures**

Townsend Standpipe coating	\$800,000
Hagersville Water Transmission main twinning	\$531,000
Nanticoke WTP electrical upgrades	\$375,000
Transmission main valve replacement	\$20,000
<b>Total</b>	<b>\$1,726,000</b>

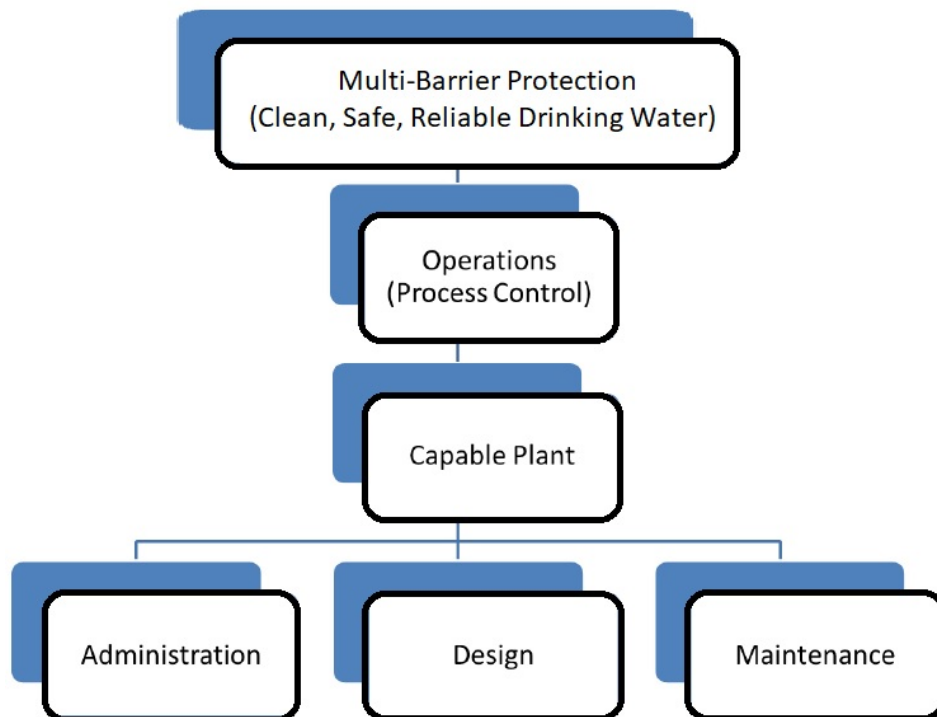
## Multi-Barrier Approach

Through the Walkerton Inquiry, Justice O'Connor recommended that drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting our drinking water. The multi-barrier approach addresses potential threats by ensuring barriers are in place to either eliminate or minimize their impact. This holistic approach recognizes that each barrier may not be able to completely remove a contaminant, but by working together the barriers provide a high-level of protection. Typical barriers include:

- **Source Protection**
  - **Source Protection Plans**
- **Treatment**
  - **Treatment and Disinfection Goals**
- **Distribution System**
  - **Residual Maintenance**
- **Monitoring**
  - **Sampling Programs**
- **Emergency Preparedness**
  - **Emergency Plans**



Haldimand County has adopted the multi-barrier approach in ensuring safe, reliable drinking water. Figure 2 shows how administration, design, maintenance, and operations work together to establish and maintain multi-barrier protection (US EPA, 1998).



**Figure 2: Responsibilities for Clean, Safe and Reliable Drinking Water**



A description of the responsibilities in each area is summarized as follows:

- **Administration:** The administrators or managers of a water treatment system are responsible for providing the resources (budget and staff) and policies (hours of staffing, reporting requirements, training and certification requirements, etc.). Funding may also need to be justified and obtained if the design of a system is inadequate or major upgrades are required. Managers establish and maintain emergency response plans and communication procedures to ensure prompt response to unsafe drinking water.
- **Design:** The designer's responsibility is to provide the physical infrastructure (pipes, valves, tanks, meters, etc.) capable of reliably producing and distributing the quality and quantity of water required. The design must provide adequate flexibility and controllability to enable the operator to make appropriate adjustments.
- **Maintenance:** The system must be maintained in good working order with the key equipment functional at all times. Should a key piece of equipment break down then it should be repaired in a timely manner.
- **Operations:** Once a capable system is in place, then it is the operator's responsibility to deliver safe drinking water through monitoring, testing and process control (for example by changing the setting on the dosing pumps). Operators are also responsible for maintaining records (log books, data forms, etc.), which aid in troubleshooting and design of upgrades. A further, and commonly unrecognized responsibility of the operator is to communicate the needs of the facility to administrators for possible action.

## WATER SAMPLING

To comply with drinking water legislation, drinking water systems are required to monitor their water quality. Haldimand County has committed to providing safe, reliable drinking water and is diligent in ensuring that sampling and monitoring programs effectively characterize water quality. All samples are taken by certified operators and tests performed by accredited, licensed laboratories.

### Microbiological Sampling

Microbial quality is one of the primary indicators for the safety of a drinking water supply. Of all contaminants in drinking water, human and/or animal feces present the greatest danger to public health. Pathogenic or disease-causing microorganisms (including certain protozoa, bacteria or viruses) may be found in untreated water supplies. Bacteriological monitoring and testing are a way to detect and control pathogenic bacteria in treated drinking water supplies. Heterotrophic Plate Count (HPC) and background bacteria samples are monitored to identify potential changes in water quality and are not used as an indicator of adverse human health effects. Table 2 provides a summary of microbiological sampling completed in the Nanticoke Drinking Water System during 2023.

**Table 2: 2023 Nanticoke Drinking Water System Microbiological Sampling**

	Number of Samples	Range of E.coli Results (cfu/100ml)	Range of Total Coliform Results (cfu/100ml)	Number of HPC Samples	Range of HPC Results (cfu/ml)	Number of Background Samples	Range of Background Results (cfu/ml)
<b>Raw</b>	162	0 – 240	0– 5,000	N/A	N/A	N/A	N/A
<b>Treated</b>	165	0	0	55	0 – 2	N/A	N/A
<b>Industrial Park Distribution System</b>	52	0	0	52	0 - 36	52	0 - 28
<b>Townsend Distribution System</b>	52	0	0	52	0 - 200	52	0 - 300
<b>Jarvis Distribution System</b>	52	0	0	52	0 - 200	52	0 -11
<b>Hagersville Distribution System</b>	52	0	0	52	0 - 30	52	0 -2
<b>Townsend Elevated Tower</b>	52	0	0	52	0 - 20	N/A	N/A
<b>Hagersville Standpipe</b>	52	0	0	52	0 – 30	N/A	N/A
<b>Hagersville Booster Station</b>	52	0	0	52	0 - 5	N/A	N/A

\*Note: At a minimum, 25% of all drinking water samples must be analyzed for HPC.

## Operational Sampling

Operational sampling and monitoring are important in maintaining the integrity of each barrier in the multi-barrier approach. Schedules 7 and 8 of Ontario Regulation 170/03, specify requirements for operational checks that municipalities must follow. Table 3 provides a summary of operational samples taken for the drinking water system. Regulatory requirements were achieved for filtered water turbidity and efforts continue to consistently achieve settled and filter targets. Disinfection regulatory requirements and operational targets were consistently achieved in 2023.

**Table 3: 2023 Nanticoke Drinking Water System Operational Sampling**

	Number of Grab Samples	Range of Results	Regulatory Requirement	Recommended Target
<b>Raw Turbidity</b>	8760	0.43 – 21.5	N/A	N/A
<b>Settled Turbidity</b>	8760	0.06 – 0.82	N/A	1.00 NTU
<b>Filtered Turbidity</b>	8760	0.0 – 0.095	≤ 0.30 in 95% of all monthly readings	0.10 NTU
<b>Treated Turbidity</b>	8760	0.0 – 1.53	N/A	≤ 5.00
<b>Free Chlorine High Lift</b>	8760	0.83 – 3.29**	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Industrial Park</b>	104	0.72 – 1.69 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Townsend</b>	104	0.75 – 1.57mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Hagersville</b>	104	0.55 – 1.81 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Jarvis</b>	104	0.68 – 1.22 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Townsend Elevated Tank</b>	365	0.64– 2.26 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Hagersville Stand Pipe</b>	365	0.55 – 1.81 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
<b>Free Chlorine Hagersville Booster Station</b>	365	0.57 – 2.23 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L

\*Note: 8760 is used for continuous monitoring.

\*\* The high residual reading (3.29 mg/L) was recorded at the high lift on July 4, 2023. This reading was due to testing of the SCADA readings for upcoming work to be done. The high reading was for 26 minutes with no impact to the distribution system.

Water treatment plant filters are backwashed to maintain or improve performance of the filters. The backwash water is discharged to a lagoon, which continuously discharges to Lake Erie. Municipal Drinking Water License number 066-102 specifies sampling requirements, summarized in Table 4, to monitor the discharge and ensure minimal impact to the natural environment.

**Table 4: 2023 Nanticoke Water Treatment Plant Lagoon Sampling**

Date of Legal Instrument Issued	Parameter	# of Samples	Annual Average (mg/L)	Regulatory Requirement
License 066-202 Dec 10, 2021	Backwash Lagoon Total Suspended Solids	53	2.69	Annual Average Concentration 25 mg/L

As result of public inquiries, a treated water hardness sampling program was initiated .

The term hardness was originally applied to waters that were hard to wash in, referring to the soap wasting properties of hard water. Hardness prevents soap from lathering by causing the development of an insoluble curdy precipitate in the water; hardness typically causes the buildup of hardness scale (such as seen in cooking pans). Dissolved calcium and magnesium salts are primarily responsible for most scaling in pipes and water heaters and can cause numerous problems in laundry, kitchen, and bath. Hardness is usually expressed in grains per gallon (or ppm) as calcium carbonate equivalent.

The degree of hardness standard as established by the American Society of Agricultural Engineers (S-339) and the Water Quality Association (WQA) is shown in the following table:

**Table 5: Standard Degree of Hardness**

Degree of Hardness	Grains per Gallon (gpg)	Ppm (mg/L)
Soft	< 1.0	< 17.0
Slightly Hard	1.0 – 3.5	17 – 60
Moderately Hard	3.5 – 7.0	60 – 120
Hard	7.0 – 10.5	120 – 180
Very Hard	> 10.5	> 180

The sample results in Table 6 indicate that the average values for Nanticoke is considered moderately hard to hard water as taken from the Degree of Hardness Table above.

**Table 6: 2023 Nanticoke Drinking Water System Hardness Sampling**

Parameter	Sample Date	Industrial Park	Townsend	Jarvis	Hagersville
<b>Total Hardness (mg/L as CaCO<sub>3</sub>)</b>	May 9, 2023	109	112	108	111
	November 28, 2023	134	131	132	131
	2023 Average ----->	<b>122</b>	<b>122</b>	<b>120</b>	<b>121</b>

## Lead Sampling

The community lead testing program is a requirement of O. Reg. 170/03 under the Safe Drinking Water Act, 2002. Haldimand County is exempt from sampling private residences due to having less than 10% of plumbing sample locations exceed the standard for two consecutive periods of reduced sampling. Annual pH and alkalinity samples are taken, as well as distribution system lead samples every three years. There are no regulatory limits for alkalinity and pH, however Haldimand County sample results are within the operational guidelines provided by the MECP. A summary of 2023 sampling has been provided in Table 7.

**Table 7: 2023 Nanticoke Drinking Water System Lead Sampling**

	Sample Type	Number of Samples	Range of Results	Number of Exceedances
<b>Industrial Park</b>	Distribution - Lead	1	0.03 ug/L	N/A
	Distribution - Alkalinity	2	96-98 mg/L	N/A
	Distribution - pH	2	8.00 - 8.01	N/A
<b>Townsend</b>	Distribution - Lead	1	0.04 ug/L	N/A
	Distribution - Alkalinity	2	99-100 mg/L	N/A
	Distribution - pH	2	8.11 - 8.14	N/A
<b>Jarvis</b>	Distribution - Lead	1	0.06 ug/L	N/A
	Distribution - Alkalinity	2	97-98 mg/L	N/A
	Distribution - pH	2	7.94 - 8.07	N/A
<b>Hagersville</b>	Distribution - Lead	1	0.12 ug/L	N/A
	Distribution - Alkalinity	2	97- 98 mg/L	N/A
	Distribution - pH	2	7.85 -8.16	N/A

## Organic Sampling

To protect drinking water from pathogens, a disinfectant (usually chlorine) is added to the drinking water. Disinfectants can react with naturally-occurring materials in the water to form disinfection byproducts (DBP), which may pose health risks.



A challenge for water systems is balancing pathogen control and disinfection byproduct formation. It is important to provide protection from pathogens while minimizing health risks from disinfection byproducts. More information on each byproduct is summarized in Table 9.

Haldimand County sample for haloacetic acids (HAA) and trihalomethanes (THM) at the water treatment plant and in the distribution system where there is an elevated potential for the formation of these byproducts. Although a treatment sample and individual distribution system samples are not required by regulation, these samples are used to monitor byproduct formation within the drinking water system.

**Table 8: Disinfection Byproduct Information**

Disinfection Byproduct	How it is formed?	Health Effects
Trihalomethanes	Trihalomethanes occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and an increased risk of cancer.
Haloacetic Acids	Haloacetic acids occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Regulatory reporting is based on a running annual average of quarterly sample results using the worst-case scenario. The calculated THM and HAA averages were below the maximum allowable concentrations (MAC) permitted by the MECP. Table 9 provides a summary of 2023 disinfection byproduct sampling.



**Table 9: 2023 Nanticoke Drinking Water System DBP Sampling**

Parameter	Sample Location	Sample Date	Sample Results (ug/L)	Annual Average (ug/L)	Regulatory MAC (ug/L)	Exceedance
<b>Haloacetic Acids</b>	Nanticoke WTP	February 6, 2023 May 1, 2023 August 8, 2023 November 6, 2023	5.6 8.8 23.7 8.7	11.7	80	<b>No</b>
	Industrial Park Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	6.3 16.6 31.3 9.7	15.9	80	<b>No</b>
	Townsend Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	7.6 18.1 36.4 19.0	20.3	80	<b>No</b>
	Jarvis Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	8.1 18.6 36.7 21.0	21.1	80	<b>No</b>
	Hagersville Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	16.3 17.1 33.6 21.3	22.1	80	<b>No</b>
<b>Trihalomethanes</b>	Nanticoke WTP	February 6, 2023 May 1, 2023 August 8, 2023 November 6, 2023	22 35 50 26	33.3	100	<b>No</b>
	Industrial Park Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	26 40 63 34	40.8	100	<b>No</b>
	Townsend Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	36 46 73 43	49.5	100	<b>No</b>
	Jarvis Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	29 45 71 51	49	100	<b>No</b>
	Hagersville Distribution	February 7, 2023 May 11, 2023 August 9, 2023 November 9, 2023	37 45 82 45	<b>52.3<sup>1</sup></b>	100	<b>No</b>

<sup>1</sup> Result exceeded half the standard prescribed in Schedule 2 on the Ontario Drinking Water Quality Standards.

Additional sample results for organic and inorganic parameters are located in the appendices.

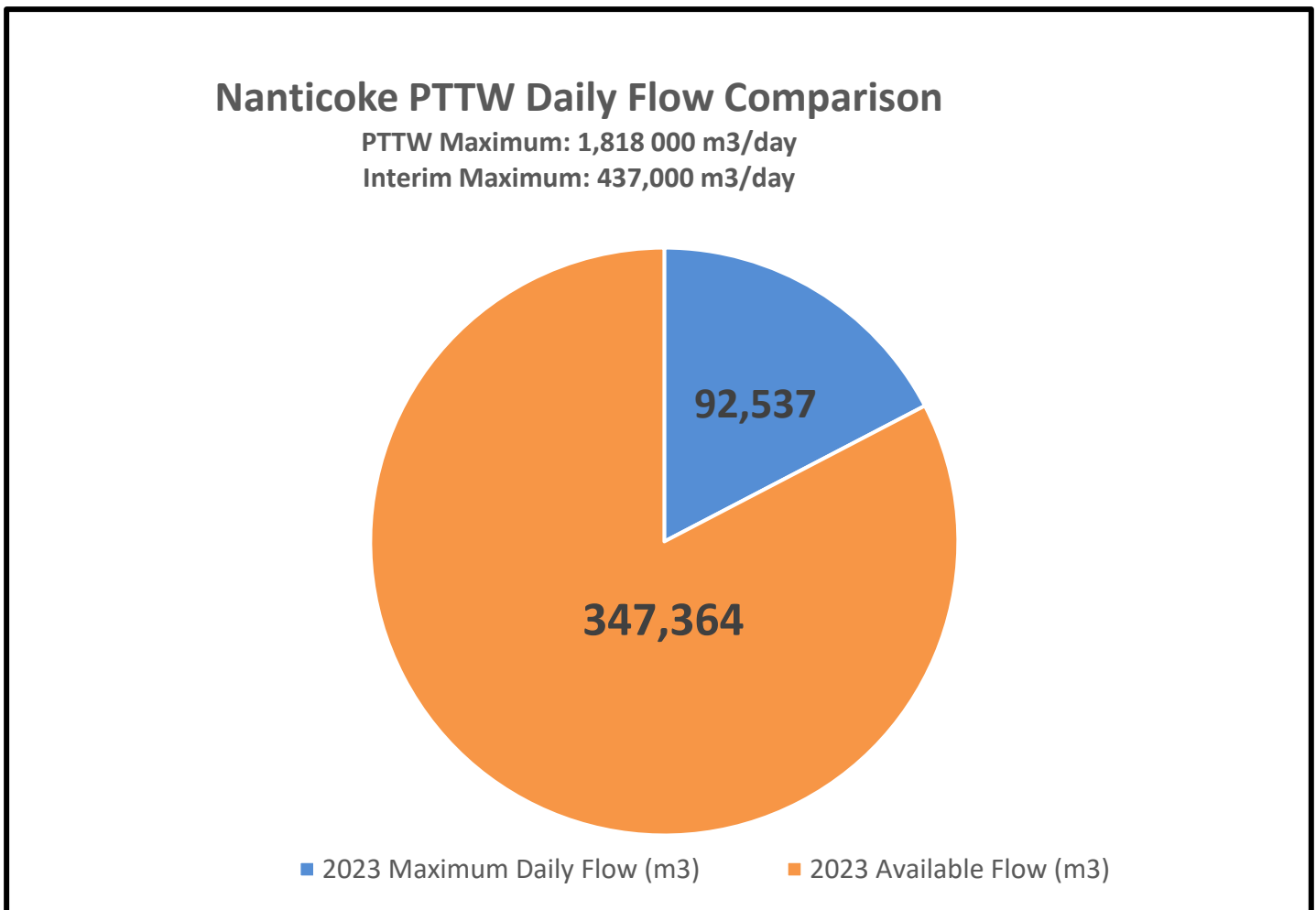
# WATER USE

## Raw Water

The Nanticoke Drinking Water System's raw water source is Lake Erie. A Permit to Take Water (PTTW) specifies the maximum volume of raw water that can be taken from the water source and conveys MECP site-specific regulatory requirements. Haldimand County has a large volume of available raw water capacity, however an interim limit of 437 MLD is in place until a number of conditions have been satisfied. When comparing the 2023 maximum raw water flow and the permit limits (Figure 3), 73% of Haldimand County's raw water allotment was available for use.

**Figure 3: Nanticoke Permit To Take Water Flow Comparison - Potable Water**

As required by Schedule 22 of Ontario Regulation 170/03, Table 10, Table 11 and Figure 4 are intended to provide a summary of potable water supplied by the Nanticoke Drinking Water System in 2023.

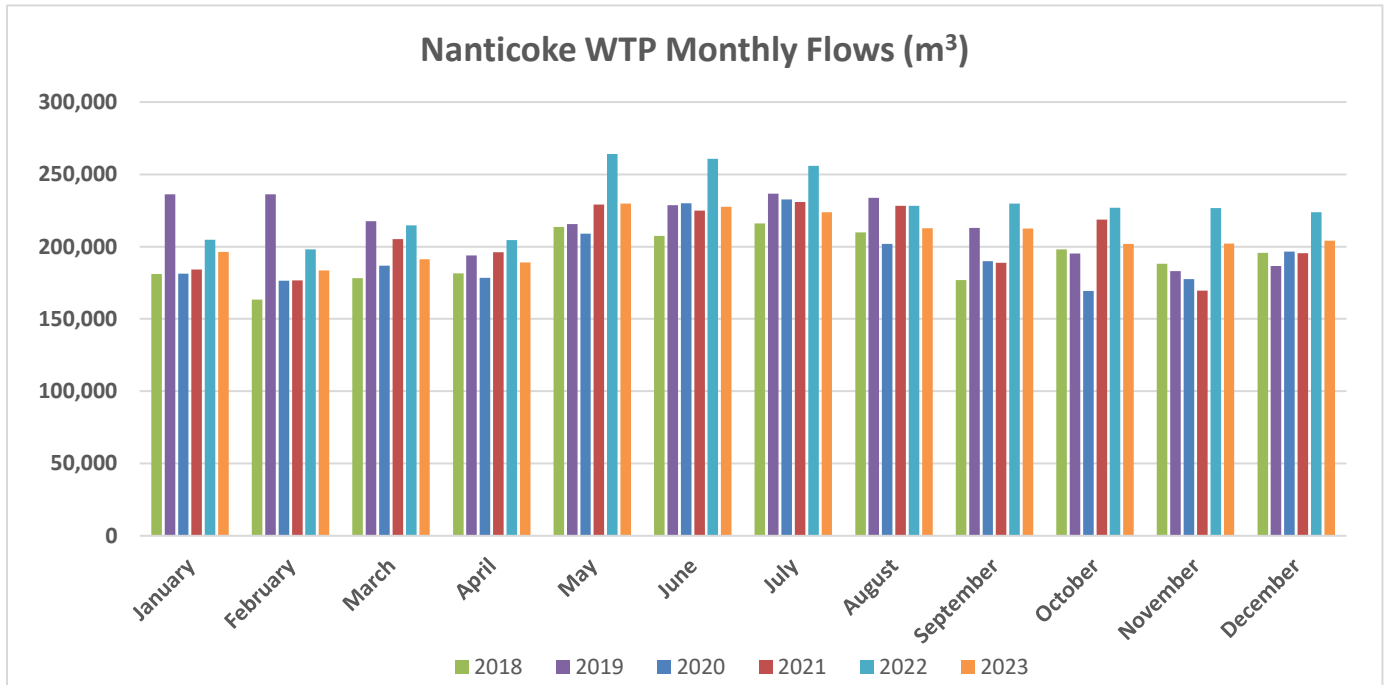




**Table 10: 2023 Nanticoke Monthly Potable Water Flow Data**

System	Month	Monthly Total m <sup>3</sup>	Daily Average m <sup>3</sup> /d	Maximum Daily Flow m <sup>3</sup> /d	Maximum Daily Peak Flow L/s
Nanticoke Drinking Water System	January	196,268	6,331	7,663	88.7
	February	183,553	6,555	7,621	88.2
	March	191,369	6,173	7,230	83.7
	April	189,136	6,304	7,632	88.3
	May	229,800	7,412	9,993	115.7
	June	227,589	7,827	9,946	115.1
	July	223,769	7,218	8,365	96.8
	August	212,700	6,861	7,654	88.6
	September	212,458	7,081	9,508	101
	October	201,941	6,514	8,042	93.1
	November	202,105	6,737	11,288	130.6
	December	204,170	6,586	7,843	90.8

Figure 4 compares the monthly flows over the last five years at the Nanticoke Water Treatment Plant. When comparing the average monthly flows for 2022 and 2023, there was a **9.6% decrease** in potable water distributed at the Nanticoke Water Treatment Plant.



**Figure 4: Nanticoke WTP Five Year Monthly Potable Flow Comparison**

The facility has a rated capacity of 13,636 cubic meters per day. When compared against the maximum daily flow for 2023, the Nanticoke Water Treatment Plant operated at approximately 82.7% of design capacity, however this calculation does not take into account any operational and infrastructure limitations.

**Table 11: Comparison of Rated Capacity and 2023 Maximum Flow Rate**

<b>System and Municipal Drinking Water License</b>	<b>Rated Capacity (m<sup>3</sup>/day)</b>	<b>Maximum Daily Flow (m<sup>3</sup>)</b>	<b>Percentage of Capacity</b>
Nanticoke 066-102	13,636	11,288	82.7%

Average system water flows are approximately **6800 m<sup>3</sup>/day**. This would represent 50% of rated capacity.

To ensure the water treatment facility is capable of meeting current and projected demands, Haldimand County staff annually review plant capability and performance and update development allocation accordingly

## **REGULATORY COMPLIANCE**

### **Adverse Water Quality Incidents**

Regulatory compliance requires reporting adverse water quality incidents to the Ministry of Health (MOH) and the MECP. In all instances, corrective action is initiated to resolve the issue.

An low pressure reading in the distribution system was reported on September 7, 2023 to the MECP and the Haldimand/ Norfolk Health Unit. A power outage at the Nanticoke Water Treatment Plant caused several high lift pumps to shut down. At the time the Elevated Tower in Townsend was out of service and the high lift distribution pump was running in pressure mode. There were several calls from residents that there was no water in the system. The MECP and the Health Unit were contacted and an adverse protocol was initiated. Hydrants were flushed, bacteriological and chlorine residual was tested. All tests came back within regulatory levels. Water pressure was returned to normal values, pressure was affected for approximately 9 minutes. .

### **Annual Drinking Water Inspection**

The MECP annually confirms compliance with drinking water legislation by conducting inspections on drinking water systems. All aspects of the drinking water system are reviewed, including treatment equipment, disinfection, training records, and operational data required under the Safe Drinking Water Act, Ontario Regulations 170/03, 169/03 and 128/04. These inspections provide Haldimand County and OCWA an opportunity to review best management practices and work towards continually improving the operation and management of the drinking water systems. Any issues of regulatory non-compliance are identified and corrective actions issued.

The findings for the 2023 annual drinking water system inspections are included in this report. Below is a summary of the key findings for the inspection:

## **Nanticoke Drinking Water System – DWS# 210001558**

There were two non-compliances identified during the 2023 inspection period. The inspection rating for 2023 in section was 99.2%

The first non-compliance was a result of approximately 251.7m<sup>3</sup> of water passing through the filters without being treated with XL-50 coagulant. This was a result of the coagulant pumps being left in manual after maintenance. Filters were immediately drained and ran to waste and the coagulant pumps put back into automatic feed. The chlorine residual in the reservoir was 0.80mg/L and the distribution analyzer was reading 1.57mg/L which is well above the regulatory requirement. A coagulant flow meter was installed and a new procedure to inspect the coagulant pump when maintenance has been completed. These corrective actions were completed to prevent any further incidents of non-compliance.

The second non-compliance was Form 1 – Record of Watermains Authorized as a Future Alteration that was not signed before the completion of the watermain installation. The corrective action was to have the unsigned form completed immediately and to create a tracking process for all groups to utilize to ensure all forms are completed before construction is completed.

Haldimand County continues to work closely with regulatory bodies to ensure a continued supply of safe, reliable drinking water to its users. All recommendations and corrective actions have been addressed and communicated to the MECF.

## **REPORT AVAILABILITY**

This report can be viewed online at:

<https://www.haldimandcounty.ca/drinking-water/>

Reports can also be obtained upon request at the Haldimand County Administration Building:



**Cayuga Administration Building**  
53 Thorburn St.  
Cayuga, ON  
N0A 1E0

For more information on report content, please contact the Haldimand County Environmental Operations Division at:

Email: [wwwops@haldimandcounty.on.ca](mailto:wwwops@haldimandcounty.on.ca)

Telephone: 905-318-5932

## Inorganic and Organic Sample Results

### Inorganic Parameters:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	March 14, 2023	ND	ug/L	No
Arsenic	March 14, 2023	0.3	ug/L	No
Barium	March 14, 2023	27.2	ug/L	No
Boron	March 14, 2023	32	ug/L	No
Cadmium	March 14, 2023	ND	ug/L	No
Chromium	March 14, 2023	0.29	ug/L	No
Mercury	March 10, 2023	ND	mg/L	No
Nitrite	February 6, 2023 May 1, 2023 August 8, 2023 November 6, 2023	0.003 0.003 0.003 0.003	mg/L	No
Nitrate	February 6, 2023 May 1, 2023 August 8, 2023 November 6, 2023	0.249 0.232 0.136 0.15	mg/L	No
Selenium	March 14, 2023	0.26	ug/L	No
Uranium	March 14, 2023	0.064	ug/L	No

**ND** = Not Detectable

## Organic Parameters:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	March 13, 2023	ND	ug/L	No
Atrazine + Metabolites	March 13, 2023	0.07	ug/L	No
Azinphos-methyl	March 13, 2023	ND	ug/L	No
Benzene	March 13, 2023	ND	ug/L	No
Benzo(a)pyrene	March 13, 2023	ND	ug/L	No
Bromoxynil	March 13, 2023	ND	ug/L	No
Carbaryl	March 13, 2023	ND	ug/L	No
Carbofuran	March 13, 2023	ND	ug/L	No
Carbon Tetrachloride	March 13, 2023	ND	ug/L	No
Chlorpyrifos	March 13, 2023	ND	ug/L	No
Diazinon	March 13, 2023	ND	ug/L	No
Dicamba	March 13, 2023	ND	ug/L	No
1,2-Dichlorobenzene	March 13, 2023	ND	ug/L	No
1,4- Dichlorobenzene	March 13, 2023	ND	ug/L	No
1,2- Dichloroethane	March 13, 2023	ND	ug/L	No
1,1- Dichloroethylene	March 13, 2023	ND	ug/L	No
Dichloromethane (Methylene Chloride)	March 13, 2023	ND	ug/L	No
2,4- Dichlorophenol	March 13, 2023	ND	ug/L	No
2,4- Dichlorophenoxy acetic acid (2,4-D)	March 13, 2023	ND	ug/L	No
Diclofop-methyl	March 13, 2023	ND	ug/L	No
Dimethoate	March 13, 2023	ND	ug/L	No
Diquat	March 13, 2023	ND	ug/L	No
Glyphosate	March 13, 2023	ND	ug/L	No
Malathion	March 13, 2023	ND	ug/L	No
MCPA	March 13, 2023	ND	ug/L	No
Metolachlor	March 13, 2023	0.02	ug/L	No
Metribuzin	March 13, 2023	ND	ug/L	No
Monochlorobenzene (Chlorobenzene)	March 13, 2023	ND	ug/L	No
Paraquat	March 13, 2023	ND	ug/L	No
Pentachlorophenol	March 13, 2023	ND	ug/L	No
Phorate	March 13, 2023	ND	ug/L	No
Picloram	March 13, 2023	ND	ug/L	No
Prometryne	March 13, 2023	ND	ug/L	No
Simazine	March 13, 2023	ND	ug/L	No
Terbufos	March 13, 2023	ND	ug/L	No
Tetrachloroethylene	March 13, 2023	ND	ug/L	No
2,3,4,6- Tetrachlorophenol	March 13, 2023	ND	ug/L	No
Total PCBs	March 13, 2023	ND	ug/L	No
Triallate	March 13, 2023	ND	ug/L	No
Trichloroethylene	March 13, 2023	ND	ug/L	No
2,4,6- Trichlorophenol	March 13, 2023	ND	ug/L	No
Vinyl Chloride	March 13, 2023	ND	Ug/L	No

**ND** = Not Detectable

## Microcystin Sample Results

Parameter	Sample Date	Raw Water Results	Treated Water Results	Unit of Measure	Exceedance
Microcystin	June 5, 2023	0.1	0.1	ug/L	<u>No</u> (less than minimum detection limit)
	June 12, 2023	0.1	0.1		
	June 26, 2023	0.1	0.1		
	July 3, 2023	0.1	0.1		
	July 10, 2023	0.1	0.1		
	July 17, 2023	0.1	0.1		
	July 24, 2023	0.1	0.1		
	July 31, 2023	0.1	0.1		
	August 7, 2023	0.1	0.1		
	August 21, 2023	0.1	0.1		
	August 28, 2023	0.1	0.1		
	September 4, 2023	0.1	0.1		
	September 11, 2023	0.1	0.1		
	September 18, 2023	0.1	0.1		
	September 25, 2023	0.1	0.1		
	October 2, 2023	0.1	0.1		
	October 9, 2023	0.1	0.1		
	October 16, 2023	0.1	0.1		
October 23, 2023	0.1	0.1			
October 30, 2023	0.1	0.1			

**ND** = Not Detectable