

Holtyre Drinking Water System

2022 Annual Summary Report



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OVERVIEW

Municipalities throughout Ontario are required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act, 2002*. The Act was passed following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking-water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of O. Reg. 170/03 requires the owner to produce an Annual Report which must include the following:

- Description of system and chemical(s) used
- Summary of any adverse water quality reports and corrective actions
- Summary of all required testing
- Description of any major expenses incurred to install, repair or replace equipment

This Annual Report must be completed by February 28 of each year.

Schedule 22 of the regulation requires that a Summary Report for Municipalities be prepared which must be presented and accepted by Council by March 31 of each year for the preceding calendar year reporting period.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any Provincial Officer Order the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act, 2002* and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

- A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows.
- A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The Annual and Summary Reports have been combined and presented to council as the Holtvre Drinking Water System 2022 Annual Summary Report.



1.0 INTRODUCTION

Drinking-Water System Name:	HOLTYRE DRINKING WATER SYSTEM
Drinking-Water System No.:	220002565
Drinking-Water System Owner:	The Corporation of the Township of Black River - Matheson
Drinking-Water System Category:	Small Municipal, Residential System
Municipal Drinking Water Licence No.:	204-101 (Issue 4 - April 23, 2021) 204-101 (Issue 5 - January 5, 2022) 204-101 (Issue 6 - March 14, 2022)
Drinking Water Work Permit No.:	204-201 (Issue 2 - June 30, 2016) 204-201 (Issue 3 - March 14, 2022)
Permit to Take Water No.:	P-300-6090341906 (Issued October 2, 2020)
Period being reported on:	January 1, 2022 to December 31, 2022

Does your Drinking Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet? No

Location where Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

**Black River - Matheson Municipal Office
367 Fourth Ave,
Matheson ON P0K 1N0**

Drinking Water Systems that receive drinking water from the Holtvre Drinking Water System

Drinking Water System Name	Drinking Water System Number
Holtvre Drinking Water System	220002565

The Annual Report was provided to all connected Drinking Water System owners

The Ontario Clean Water Agency prepared the 2022 Annual Summary Report for the Holtvre Drinking Water System and provided a copy to the system owner; the Township of Black River - Matheson. The Holtvre Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

System users are notified that the Annual Report is available through:

- Public access/notice via newspaper/website



2.0 DESCRIPTION OF THE DRINKING WATER SYSTEM

Well No. 1 is located 17.5 metres south of Cain Street and 12 metres west of Euclid Street. It is a 200 mm diameter, 57 metre deep drilled groundwater well equipped with a 1.2 kW submersible deep well pump, rated at 47 litres per minute at a Total Dynamic Head of 50.7 metres with a 50 mm diameter discharge line connected to the pump header located in the pumphouse. It is considered the secondary production well for the Holtyre drinking water system.

Well No. 3 is the main production well and is located 19.6 metres west of the road allowance between Concessions 1 and 2, Township of Hislop and 594 metres south of the intersection with Highway 572. It is a 150 mm diameter, 37 metre deep drilled groundwater well equipped with a 1.2 kW submersible deep well pump, rated at 100.8 litres per minute at a Total Dynamic Head of 34 metres with a 50 mm diameter discharge line connected to the pump header located in the pumphouse.

The water treatment plant is located within the village of Holtyre at 644 Euclid Avenue. It receives raw groundwater from Wells 1 & 3. Within the water treatment plant, the individual well discharge pipes are metered for flow and then join one common header. An iron and manganese sequestering agent is added to the water prior to being injected with 12% sodium hypochlorite. Treated water is then discharged to the clearwell. The disinfection system consists of two chemical metering pumps (one duty and one on standby) and one chemical solution tank. The iron sequestering system consists of two chemical metering pumps (one duty and one on standby) and one chemical solution tank.

Other equipment located within the water treatment plant: 12.5 kW diesel generator and associated fuel tank, three 3HP submersible high lift pumps (2 duty, 1 standby) each with variable frequency drives and a capacity of 3 L/second, one 0.9 m³ pressure tank and one 2255 litre chlorine contact tank (to be utilized when the clearwell is not in operation).

Located under the floor slab of the water treatment plant, the clearwell is a 151 m³ un-baffled storage reservoir. The high lift pumps transfer the treated water from the reservoir to the pressure tank and subsequently to the distribution system.

The system serves an approximate population of 255 persons in 75 private residences with an estimated total of 99 service connections. The distribution system itself consists primarily of four inch asbestos concrete constructed water main. There is no elevated storage in this system. There are three hydrants which are used only for distribution system flushing, not fire protection.

In late 2007 the municipality installed two automatic flushing devices in strategic locations in the distribution system as a measure to improve the aesthetic water quality.

Note: The other hydrants located within the village are not part of the drinking water system. Prior to the establishment of the drinking water system, the Ross Mine provided water for fire protection through a system of hydrants. With the closure of the mine, this water system was abandoned. These non-functional hydrants and associated water mains were/are not connected to the existing drinking water system.

3.0 LIST OF ALL WATER TREATMENT CHEMICALS USED

- Sodium Hypochlorite - disinfection
- ENV ROQUEST (tetrapotassium pyrophosphate solution) - Iron & Manganese Sequestering

4.0 SIGNIFICANT EXPENSES INCURRED

- New flow meter for Well 3
- New chlorine analyzer for treated water
- Operations & maintenance costs



5.0 NOTICES REPORTED & SUBMITTED TO THE SPILLS ACTION CENTER

There were no incidents that required notification to the Spills Action Center in 2022

6.0 MICROBIOLOGICAL TESTING

Sample Type	No. of Samples	<i>E. coli</i> Results (min to max)	Total Coliform Results (min to max)	# of HPC Samples	HPC Results (min to max)
Raw - Well 1	14	0 to 0	0 to 2	N/A	N/A
Raw - Well 3	13	0 to 0	0 to 0	N/A	N/A
Distribution	26	0 to 0	0 to 0	26	<10 to 30

Maximum Allowable Concentration (MAC) for distribution samples: *E. coli* = 0 Counts/100 mL and Total Coliforms = 0 Counts/100 mL
 “<” denotes less than the laboratory’s method detection limit.

Note: One microbiological sample is collected and tested each month from the raw water supply and one every two weeks from the distribution system.

7.0 OPERATIONAL TESTING

Raw Water Turbidity

Location	No. of Samples	Range of Results (min to max)	Unit of Measure
Well 1	11	0.55 to 2.52	NTU
Well 3	13	0.22 to 0.67	NTU

**Continuous Monitoring in the Treatment Process**

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine	8760	0.62 to 2.01	mg/L	N/A

Notes: For continuous monitors 8760 is used as the number of samples.

Chlorine Residuals from the Distribution System

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine	108	0.73 to 1.29	mg/L	0.05

Note: in the distribution system, at least two samples for free chlorine residual testing must be taken at least 48-hours apart and taken during the same week, each week.

Nitrate & Nitrite Results from the Water Treatment Plant

Date of Sample	Nitrate Result Value (mg/L)	Nitrite Result Value (mg/L)	Exceedance
January 4	<0.05	<0.05	No
April 11	<0.05	<0.05	No
July 4	<0.1	<0.01	No
November 11	<0.05	<0.05	No

Maximum Acceptable Concentration (MAC) for Nitrate = 10 mg/L

MAC for Nitrite = 1.0 mg/L

Total Trihalomethane (THM's) Results from the Distribution System

Date of Sample	Result Value (ug/L)	Four Quarter Running Average	Exceedance
January 4	21.5	29.48	No
April 11	23.6	29.63	No
July 4	27.3	25.45	No
October 11	23.4	23.95	No

Maximum Acceptable Concentration (MAC) = 100 ug/L (Four Quarter Running Average)

Total Haloacetic Acid (HAA's) Results from the Distribution System

Date of Sample	Result Value (ug/L)	Four Quarter Running Average	Exceedance
January 4	21	25	No
April 11	8	20.25	No
July 4	22	19	No
October 11	25	19	No

Maximum Acceptable Concentration (MAC) = 80 ug/L (Four Quarter Running Average)



Lead (most recent), pH & Alkalinity Results (from the distribution system)

Date of Sample	# of Samples	Range of Results (min to max)		
		pH Results	Alkalinity Results (mg/L)	Lead Results (ug/L)
April 14	1	7.8	301	0.4 (April 7, 2020)
September 19	1	8.4	306	<0.1 (Oct 15, 2020)

MAC for Lead -10 ug/L

Note: The system is required to test for total alkalinity and pH in one distribution sample collected during the period of December 15 to April 15 and one distribution sample during the period of June 15 to October 15. This testing is required in every 12-month period with lead testing in every third 12-month period. The next round of lead sampling will be completed in April and October of 2023.

Summary of Most Recent Schedule 23 Inorganic Results from the Water Treatment Plant

Sample Date: September 21, 2020

Parameter (ug/L)	Result Value	Maximum Acceptable Concentration	Exceedance
Antimony	<0.5	6	No
Arsenic	2	10	No
Barium	47	1000	No
Boron	142	5000	No
Cadmium	<0.1	5	No
Chromium	<1	50	No
Mercury	<0.1	0.001	No
Selenium	<0.2	10	No
Uranium	<1	20	No

Note: Sampling required once every 60 months (next sample scheduled for October 2025)

Summary of Most Recent Schedule 24 Organic Results from the Water Treatment Plant

Sample Date: September 21, 2020

Parameter	Result Value	Unit of Measure	Standard	Exceedance
1,1-Dichloroethylene	<0.3	ug/L	14	No
1,2-Dichlorobenzene	<0.3	ug/L	200	No
1,2-Dichloroethane	<0.3	ug/L	5	No
1,4-Dichlorobenzene	<0.3	ug/L	5	No
2,3,4,6-Tetrachlorophenol	<0.3	ug/L	100	No
2,4,6-Trichlorophenol	<0.3	ug/L	100	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.325	ug/L	100	No
2-4 Dichlorophenol	<0.3	ug/L	900	No
Alachlor	<0.233	ug/L	5	No
Atrazine + N-dealkylated metabolites	<0.5	ug/L	5	No
Azinphos-methyl	<0.175	ug/L	20	No
Benzene	<0.1	ug/L	1	No
Benzo(a)pyrene	<0.01	ug/L	0	No
Bromoxynil	<0.0866	ug/L	5	No
Carbaryl	<2	ug/L	90	No



Parameter	Result Value	Unit of Measure	Standard	Exceedance
Carbofuran	<3	ug/L	90	No
Carbon Tetrachloride	<0.2	ug/L	2	No
Chlorobenzene	<0.5	ug/L	80	No
Chlorpyrifos	<0.175	ug/L	90	No
Diazinon	<0.175	ug/L	20	No
Dicamba	<0.0758	ug/L	120	No
Dichloromethane	<1	ug/L	50	No
Diclofop-methyl	<0.108	ug/L	9	No
Dimethoate	<0.175	ug/L	20	No
Diquat	<0.2	ug/L	70	No
Diuron	<9	ug/L	150	No
Glyphosate	<20	ug/L	280	No
Malathion	<0.175	ug/L	190	No
MCPA	<5.41	ug/L	230	N/A
Metolachlor	<0.117	ug/L	50	No
Metribuzin	<0.117	ug/L	80	No
Paraquat	<0.2	ug/L	10	No
Pentachlorophenol	<0.4	ug/L	3	No
Phorate	<0.117	ug/L	60	No
Picloram	<0.0758	ug/L	2	No
Prometryne	<0.0583	ug/L	1	No
Simazine	<0.175	ug/L	10	No
Terbufos	<0.117	ug/L	1	No
Tetrachloroethylene	<0.3	ug/L	10	No
Total PCB's	<0.06	ug/L	190	No
Triallate	<0.117	ug/L	5	No
Trichloroethylene	<0.2	ug/L	5	No
Trifluralin	<0.117	ug/L	45	No
Vinyl Chloride	<0.1	ug/L	1	No

Note: Sampling required once every 60 months (next sample scheduled for October 2025)

Most Recent Sodium Results from the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
September 21, 2020	1	24.2 mg/L	mg/L	20	Yes - AWQI 152286
October 2, 2020	1	22.1 mg/L			Yes - Re-sample

Note: Sample required every 60 months. Next sampling scheduled for October 2025

Most Recent Fluoride Results from the Water Treatment Plant

Date of Sample	No. of Samples	Result Value	Unit of Measure	Standard	Exceedance
September 21, 2020	1	0.17	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2025



Inorganic or Organic Results that Exceeded Half the Standard

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.

Additional Testing Performed in Accordance with a Legal Instrument.

No additional testing was required in 2022.

8.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

Incident #1 – Flow Meters Not Calibrated Within Required Time Period

Legislation	Municipal Drinking Water License (Schedule 3, Condition 3.0)
Requirement(s) the System Failed to Meet	Raw and treated water flow meters were not calibrated within +/- 30 days of the required 12-month period in 2021 (previous calibration was conducted on June 22nd, 2020).
Corrective Action	On February 11th, 2022, the operating authority conducted the calibration of the raw and treated water flow meters
Status	Resolved

Incident #2 - Treated Chlorine Residual Not Monitored Continuously

Legislation	Ontario Regulation 170/03, Schedule 6
Requirement(s) the System Failed to Meet	Monitoring of the free chlorine residual required to achieve primary disinfection must be conducted at least every five minutes. Details: Two events of loss of monitoring due to analyzer functionality; if there is too little flow to the chlorine analyzer it stops reading the residual and flat lines at the last reading. The analyzer was installed on March 9 and the function was identified on March 10. March 9 - 9:44 am to 10:57 am (13 mins) March 10 - 8:05 am to 8:43 am (38 mins)
Corrective Action	Residuals monitored with hand held analyzer while maintenance was performed on the continuous analyzer. Distribution chlorine residuals = 1.05 mg/L (Security Bldg) and 1.22 mg/L (682 Gleason Ave.). Local MECP Inspector notified.
Status	Resolved



Incident #3 - Treated Chlorine Residual Not Monitored Continuously

Legislation	Ontario Regulation 170/03
Requirement(s) the System Failed to Meet	<p>Monitoring of the free chlorine residual required to achieve primary disinfection must be conducted at least every five minutes.</p> <p>Details: Loss of chlorine residual monitoring for 13 minutes on March 19, from 17:01 hrs to 17:14 hrs, due to analyzer functionality; if there is too little flow to the chlorine analyzer it stops reading the residual and flat lines at the last reading. Previously this was resolved by moving the lines.</p> <p>The wells were off during the loss of monitoring and there was no reason to suspect any issues with chlorine as the residual was same before and after the event. Analyzer reading 1.10 mg/L before the low flow alarm and 1.12 mg/L after flow was restored.</p>
Corrective Action	<p>Operator made a change to the pressure column to increase flow to analyzer.</p> <p>Tubing size reduced from 3/8" to 1/4" on the pressure column to increase the amount of pressure going to analyzer. Flow readings on analyzer are now stable at around 150-160 mL a minute. Analyzer manual calls for between 60-200 mL/min.</p> <p>Distribution Residuals taken:</p> <p>1.02 mg/L at the Security Building (1747 hrs) and 1.09 mg/L at the Rink Shack (1755 hrs). Local MECP Inspector notified.</p>
Status	Resolved

Incident #4 - Chemical Exceeded NSF Maximum Dosage of 29 mg/L

Legislation	MDWL Schedule B Condition 14.1
Requirement(s) the System Failed to Meet	<p>August 18: It was determined that there was a calculation error in the formula for calculating Proquest (Iron & Manganese Sequestering agent) dosages at the Holtvre WTP. The chemical is 100% active and is not 55% strength, therefore the calculated dosages were lower than the actual dosages. After adjusting for the error it was found that there had been exceedances of the max dose of 29 mg/L specified by NSF on multiple dates.</p>
Corrective Action	<p>Adjusted the formula used for calculating the Proquest dosage on August 18, 2022. Adjusted the dosage rate of the Proquest pump to achieve the recommended dose of approximately 13 mg/L on Aug 18, 2022. The supplier was contacted about the exceedance on August 18, 2022 and they advised that the product would have no adverse health effects. Local MECP Inspector notified.</p>
Status	Resolved



Incident #5 - Permit To Take Water Exceedance

Legislation	Permit to Take Water #P-300-6090341906
Requirement(s) the System Failed to Meet	Well 1 flow rate exceeded the limit of 70 L/min for 18 minutes on December 5, 2022. Details: On December 3 treated flows doubled and the plant was having a hard time keeping up so Well 1 flow rate was increased but it was kept below the limit. A few days later, Well 1 was run for sampling, but the flow rate had not been turned back down and since it was running by itself the earlier adjustment was enough to make it run over the limit (max = 76.2 L/min).
Corrective Action	The flow rate for well 1 was turned back down.
Status	Resolved

9.0 SUMMARY OF FLOW RATES AND QUANTITIES

The following tables and graphs indicate the quantities and flow rates of water taken and produced during the reporting period, including monthly average flows, maximum daily flows and the total monthly volumes. A comparison of the water data is made to the rated capacity and flow rates specified in the system’s Permit to Take Water and the Municipal Drinking Water License.

Any raw water flow rate exceedances in 2022 were checked and determined to be inflated numbers due to momentary spikes on pump start up/shutdown that lasted less than 5 minutes and are not representative. The actual maximum flow rates have been depicted in the tables below.

Well 1 - Summary of Water Taking

Regulated by Permit to Take Water (PTTW) P-300-6090341906, Issued October 2, 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	0	10.95	4.71	0	0	9.72	1.2	2.28	0	0	1.33	131.73	161.9
Average Volume (m ³ /d)	0	0.39	0.15	0	0	0.32	0.04	0.07	0	0	0.04	4.25	0.44
Maximum Volume (m ³ /d)	0	10.95	2.59	0	0	5.73	1.2	2.28	0	0	1.33	83.13	83.13
PTTW - Maximum Allowable Volume (m ³ /day)	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8	100.8
Maximum Flow Rate (L/min)	60.0	0.0	0.0	66.0	0.0	97.8	0.0	0.0	0.0	105.6	0.0	76.2	105.6
PTTW - Maximum Allowable Flow Rate (L/min)	70	70	70	70	70	70	70	70	70	70	70	70	70

The system’s Permit to Take Water #P-300-6090341906 allows the municipality to withdraw a maximum volume of 100.8 cubic meters from Well 1 each day. A review of the raw water flow data indicates that the system never exceeded this allowable limit having a maximum volume of 83.13 m³.

The Permit also allows a maximum flow rate of 70 L/minute which was exceeded on three occasions in 2022 with a maximum of 105.6 L/min. The flow rate was exceeded on June 15 and October 20 as a result of startup spikes lasting less than five minutes which is permitted under the PTTW. The flow rate was also exceeded on December 5 for 18 minutes due the pump rate not being returned to the normal setting after a high demand event (see section 8.0, Incident #5 for more details).



Well 3 - Summary of Water Taking

Regulated by Permit to Take Water (PTTW) #P-300-6090341906, Issued October 2, 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	1084	871	1269	1027	1163	1060	1087	1116	989	912	918	1087	12582
Average Volume (m ³ /d)	35	31	41	34	38	35	35	36	33	29	31	35	34
Maximum Volume (m ³ /d)	64	36	47	46	74	53	43	52	59	41	41	74	74
PTTW - Maximum Allowable Volume (m ³ /day)	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6	129.6
Maximum Flow Rate (L/min)	73	71	71	71	71	71	72	72	80	75	75	75	80
PTTW - Maximum Allowable Flow Rate (L/min)	90	90	90	90	90	90	90	90	90	90	90	90	90

The system's Permit to Take Water #P-300-6090341906 allows the municipality to withdraw a maximum volume of 129.6 cubic meters from Well 3 each day. A review of the raw water flow data indicates that the system never exceeded this allowable limit having a maximum volume of 74 m³.

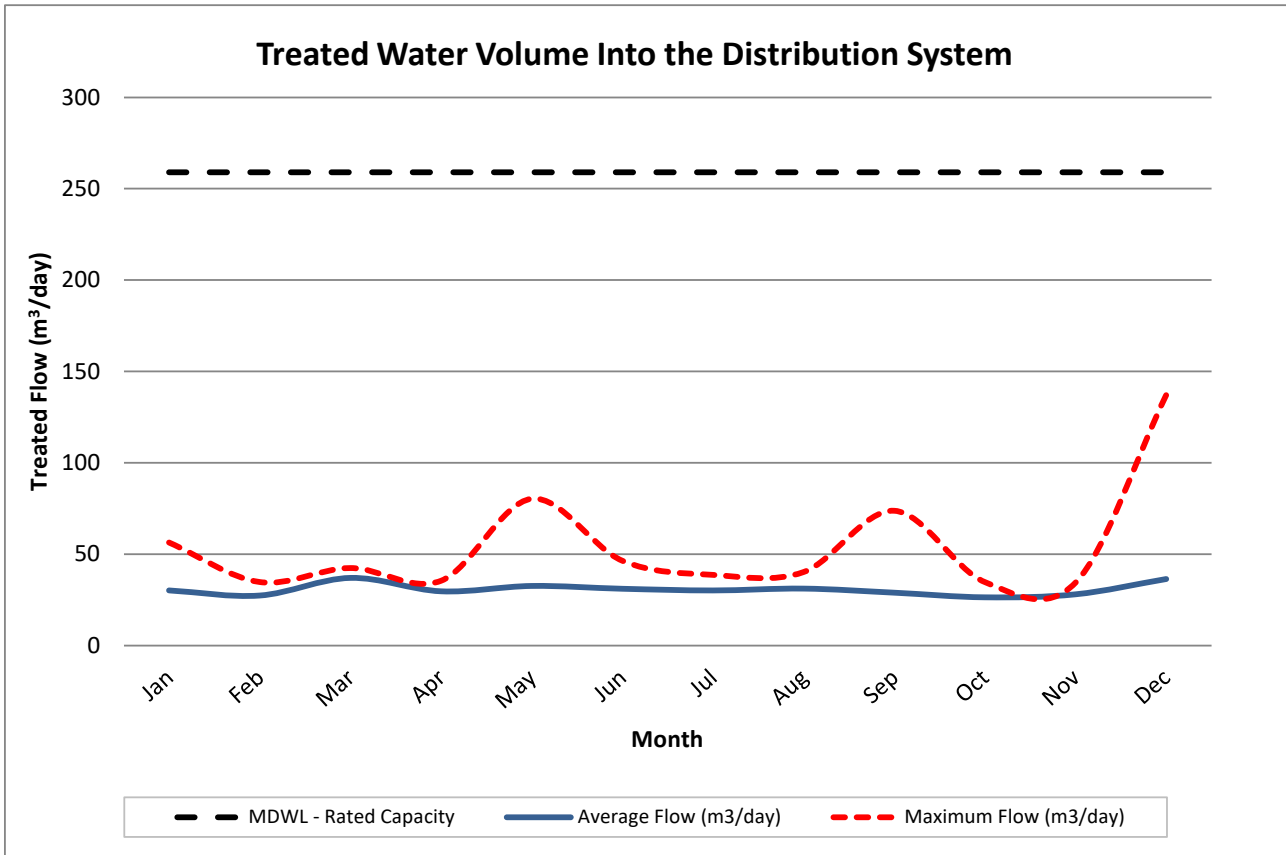
The Permit also allows a maximum flow rate of 90 L/minute. The maximum flow rate was 80 L/min, which is under the limit.

Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #204-201 (Issue 4 - April 23, 2021), #204-201 (Issue 5 - January 5, 2022), and #204-201 (Issue 6 - March 14, 2022)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	936	767	1149	892	1012	933	936	967	869	819	842	1130	11252
Average Volume (m ³ /d)	30	27	37	30	33	31	30	31	29	26	28	36	31
Maximum Volume (m ³ /d)	56	35	42	35	80	46	39	40	74	35	34	137	137
MDWL - Rated Capacity (m ³ /day)	259	259	259	259	259	259	259	259	259	259	259	259	259
% Rated Capacity	22	13	16	14	31	18	15	16	28	13	13	53	53

Schedule C, Section 1.1 of MDWL No. 204-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed a maximum flow rate of 259 m³ on any calendar day. The Holtvre DWS complied with this limit having a recorded maximum volume of 137 m³, which is 53 % of the rated capacity.



Volume of Treated Water Supplied to the Distribution System. A comparison of the rate specified in the system’s Municipal Drinking Water Licence to the average and maximum volumes entering the distribution system.

Comparison of the Flow Summary to Systems Licence & Permit

Rated Capacity of the Plant (MDWL)	259 m ³ /day	
Average Daily Flow for 2022	31 m ³ /day	12 % of the rated capacity
Maximum Daily Flow for 2022	137 m ³ /day	53 % of the rated capacity
Total Treated Water Produced in 2022	11,242 m ³	

The Holtvre water treatment plant is rated to 259 cubic meters of water per day as specified in the system’s Municipal Drinking Water Licence. The average daily flow was 31 m³ per day, which is 12% of the rated capacity. This information clearly shows that the plant is well within its rated capacity and is able to meet current demands of consumers.

10.0 CONCLUSION

The Holtvre Drinking Water System was able to meet the community’s demand for drinking water while complying with the terms and conditions outlined in its Drinking Water Works Permit and Municipal Drinking Water Licence and the regulatory requirements of the Safe Drinking Water Act and its Regulations with the exception of the incidents mentioned in section 8 of this report.