Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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February 2021

Mayor Harold McQuaker and Council
The Corporation of the Township of Emo
P.O. Box 520
Emo, Ontario
P0W 1E0

Re: 2020 Annual Summary Report for the Emo Drinking-Water System

Ontario's Drinking-Water Systems Regulation (O.Reg.170/03), made under the *Safe Drinking Water Act, 2002*, requires that the owner of a drinking water system prepare an annual summary for municipalities on the operation of the system and the quality of its water.

The annual summary must cover the period of January 1st to December 31st in a year and must *be prepared not later than March 31st* of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2020 Annual Summary for the Emo Drinking-Water System.

Pursuant to the legislative requirements, *Schedule 22 Summary Reports for Municipalities*, the annual summary must:

(a) list the 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; and,

(b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure."

- O. Reg. 170/03 s. 22 (2)

"The report must also include the following information for the purpose of enabling the owner of the system to assess the rated capability of their system to meet existing and planned uses of the system:

1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.

2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement."

-O. Reg. 170/03 s. 22 (3)

In addition, Section 12 (1) - 4 - gives the direction that a copy of the annual summary for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the municipality, or at a location that is accessible to the users of the water system.

This report was prepared by the Ontario Clean Water Agency on behalf of the Township of Emo and is based on information kept on record by OCWA at the Emo Drinking-Water System. The report covers the period January 1st through to December 31st 2020.

Yours truly,

Jeff St. Pierre
Regional Hub Manager
Northwestern Ontario Regional Hub
705-943-5578

Copy to: Bridget Foster – CAO/Clerk-Treasurer
Operations Staff – Emo Water Treatment

2020 Schedule 22 Annual Summary Report

Emo Drinking-Water System

February 2021

Prepared by the

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Table of Contents

Section 1: Introduction

This report is a summary of water quality information for the Emo Drinking-Water System, published in accordance with Schedule 22 of Ontario's Drinking-Water Systems Regulation for the reporting period of January 1st to December 31st 2020. The Emo Drinking-Water System is categorized as a Large Municipal Residential Drinking Water System.

This report is prepared by The Ontario Clean Water Agency on behalf of the Corporation of the Township of Emo. A copy of the Summary Report is to be provided to the members of the municipal council by March 31st 2021.

Section 2: What Does This Report Contain?

"The report must,

(a) list the 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; and,

(b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure."

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- O. Reg. 170/03 s. 22 (3)

Section 3: Daily Flow Rates

In accordance with the ***Municipal Drinking Water Licence 288-101 Schedule C: System – Specific Conditions 1.0 Performance Limits,*** the Emo drinking-water system shall not be operated to exceed the rated capacity for maximum flow rate from the treatment subsystem to the distribution system of **950 m^3 / day.**

The drinking-water system may be operated temporarily at a rate above the rated capacity where necessary for:

i) the purposes of fighting a large fire or,

ii) the maintenance of the drinking-water system

The Emo Drinking-Water facility operated below the rated capacity of 950m^3/day in 2020. The average monthly raw flow rate was 12,076.25 m^3; the average raw daily flow rate was 395.79 m^3, with a maximum raw daily flow rate of 613.00 m^3.

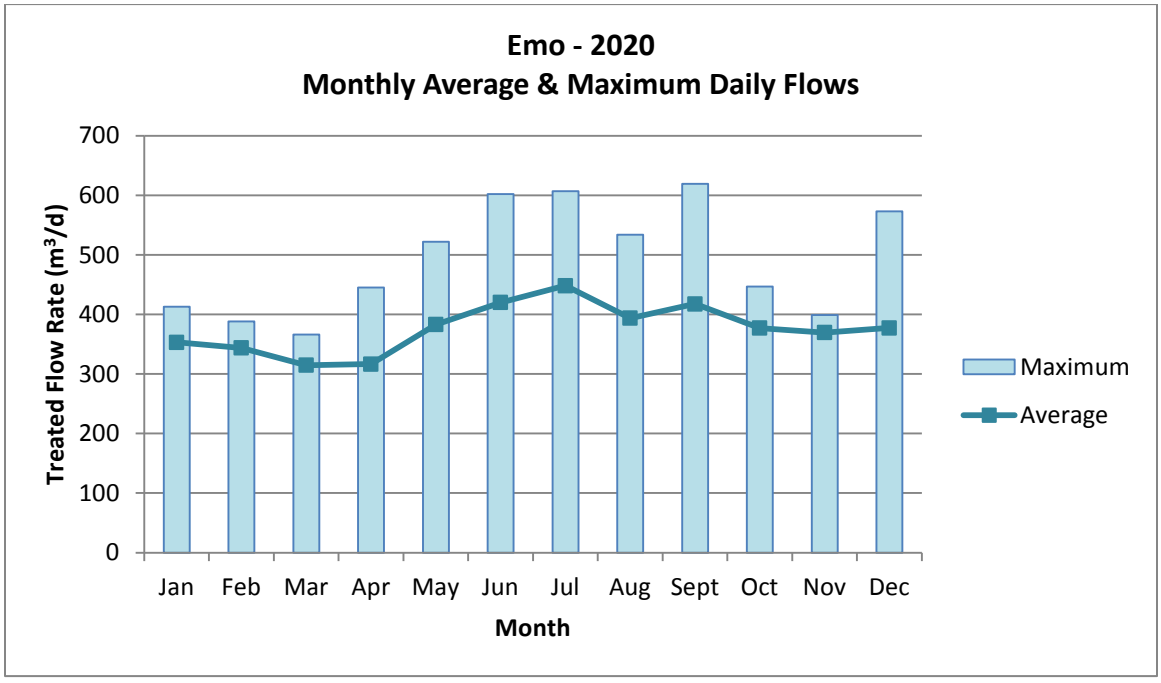
In 2020, the average monthly treated flow rate was 11,478.25 m^3; the average daily treated flow rate was 376.21 m^3; and the maximum daily treated flow rate for the year was 619.00 m^3representing 65.16% of the allowable daily volume.

A summary of raw and treated flows, including maximum raw flow into the treatment system as well as treated average, maximum and total flow rates are included in the tables below.

The quantity of raw water supplied during the reporting period did not exceed the terms and conditions of the *Permit to Take Water* while the maximum daily treated flow rate did exceed the rated capacity for this system.

Monthly Raw & Treated Flow Rates for 2020

Month	Average Daily Raw Flow Rate (m^3/d)	Maximum Daily Raw Flow Rate (m^3/d)	Average Daily Treated Flow Rate (m^3/d)	Maximum Daily Treated Flow Rate (m^3/d)	Total Monthly Treated Flow Rate (m^3/month)
January	373.45	437.00	353.03	413.00	10944.00
February	359.66	417.00	343.76	388.00	9969.00
March	330.84	406.00	314.77	366.00	9758.00
April	331.97	514.00	316.60	445.00	9498.00
May	400.39	555.00	382.97	522.00	11872.00
June	444.63	555.00	420.10	602.00	12603.00
July	471.32	613.00	448.16	607.00	13893.00
August	410.19	579.00	393.65	534.00	12203.00
September	432.53	544.00	417.60	619.00	12528.00
October	409.19	531.00	376.94	447.00	11685.00
November	388.97	428.00	369.50	399.00	11085.00
December	396.29	556.00	377.45	573.00	11701.00
		2020 Total Treated Flows (m^3)		**137,739.00**	



Section 4: System Failures and Correction

The Ministry of Environment conducted an *announced* inspection of the Emo Drinking Water System on October 7, 2019. There was no inspection in 2020. The 2019 final inspection report identified five non-conformance as summarized in the table below.

The 2019 final inspection rating record for the Emo Drinking Water System was 86.06%.

Item	Non-Compliance Identified	Compliance Date	Action Being Taken to Address item	Status
1	**There was not sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.** Condition 2.1, Schedule C of Municipal Drinking Water License (MDWL) #288-101 requires continuous flow measurement and recording of the flow rate and daily volume of raw water flowing into the treatment plant and treated water flowing from the treatment plant to the distribution system. One raw and one treated water flow meter have been installed to meet this requirement. Raw and treated water flow rates and volume are recorded every 5 minutes on the plant's computer. Commencing mid-July, the SCADA PLC displayed treated water flow rates and daily volumes incorrectly. The daily volume was documented 525 m3 higher than the actual value and the flow rate was documented 23 m3/hr higher than actual value. An assessment of the SCADA system revealed a possible faulty "analog input card" that may be the source of the problem.	N/A	N/A	Completed
2	**Where an activity has occurred that could introduce contamination, all parts of the drinking water system were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.** Section 2.3 of MDWL 288-201 requires that all parts of the drinking water system in contact with drinking water which are added, modified, replaced, extended or taken out of service for inspection, repair or other activities that may lead to contamination, shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents: a) The ministry's Watermain Disinfection Procedure b) AWWA C652 - Standard for Disinfection of Water-Storage Facilities; c) AWWA C653 - Standard for Disinfection of Water	January 17 2020	The facility Operators will be taking an online webinar for Watermain Disinfection in Ontario on Jan 22nd, as well as a review of the OCWA Water Main Disinfection Form with a PCT. There will be a training record issued for both once they have been completed.	In Progress

	Treatment Plants During the review period there were a number of new watermains that were connected to the distribution system. After a review of the log records, it was not clear what steps were taken prior to bringing the new lines into service. It cannot be confirmed if proper disinfection, of newly installed equipment, took place in accordance with the Watermain Disinfection Procedure.			
3	**Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.** Turbidity readings are required to be recorded at least once every 15 minutes and chlorine readings at least once every five minutes in accordance with the requirements of Schedule 6, O. Reg. 170/03. Filter effluent turbidity for each filter and treated water chlorine residual readings are typically recorded every 5 minutes at the Emo WTP in an Excel program and trended in a Wonderware Program. Despite this, numerous times throughout the review period, the chlorine analyzer was taken off-line for maintenance or repairs for an extended period of time and chlorine residuals were not taken at the required frequency. For example, on April 4, 2019, the treated water chlorine analyzer was taken off-line for maintenance from 11:12 to 14:53. During this time chlorine residuals were taken with a portable device, but they were taken at a frequency greater than 5 minutes.	Immediately	The PCT will review the minimum analyzer reading requirements found in Schedule 6, O.Reg 170/03 with the Operators. They will also review the MECP Technical Bulletin on filtration process and chlorination document. There will be a training record provided for both once completed.	In Progress
4	**All continuous analysers were not calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.** O. Reg. 170/03, Schedule 6, subsection 6-5(1), paragraph 8, requires drinking water system owners and operating authorities to ensure that continuous analyzers are checked and calibrated in accordance with manufacturer's instructions. The owner's manual for the turbidity meters did not specify how frequently the instruments need to be calibrated. The owner's manual for the chlorine analyzer requires the instrument to be calibrated once every 6-12 months. In addition to being calibrated annually, the continuous chlorine and filter effluent turbidity analyzers were cleaned periodically throughout the inspection review period. Treated water chlorine residuals taken with the hand held instrument were compared to the on-line analyzer. A span calibration was completed on the continuous analyzer when necessary; however, on August 2, 2019, the operator purposely span	January 17 2020	This issue has been Resolved. OCWA operators have access to the SCADA enable/disable alarming action key and could have disabled the alarm while on site thus eliminating the audible nuisance of that alarm. Operator was caught up in resolving the problem and didn't think to taking this action, instead manipulated the analyser to prevent alarm. We will need to develop an SOP that ensures when an operator takes this action that he/she remains on site to ensure operations remain in compliance and the alarm must be Enabled before or at any	Completed

	calibrated the treated chlorine analyzer to read higher than the actual reading to stop the plant from alarming (actual 0.74 mg/L, calibrated to 1.39 mg/L). For the next two hours, the operator monitored the chlorine residual increase before re-calibrating it to the actual reading. A review of the trending confirmed the chlorine residual continued to increase during this time.			time the operator leaves the site. The PCT will also review the minimum analyzer reading requirements found in Schedule 6, O.Reg 170/03 with the Operators. A training form will follow review of this SOP and Regulation review.	
5	**The following instance(s) of non-compliance were also noted during the inspection:** 1. One of the criteria necessary to obtain disinfection log removal credits for conventional filtration is that the system must meet the performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month. To calculate this, only the measurements taken when the particular filter effluent line is directing water to the next stage of the treatment process. Some drinking water systems may be taking turbidity measurements even when the filter is either in backwash mode or filter-to-waste-mode. These "off-line" measurements are not to be included in the calculation. During the review period, the Emo WTP was using every turbidity measurement in their monthly filter effluent turbidity calculation, including when the system is "off-line". Since the inspection, it has been identified that this has been corrected. 2. O. Reg. 128/04 section 27 outlines record-keeping requirements regarding the operation of a facility. Some of the requirements include that: - 27(4) a person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry. - 27(5)(1) in each operating shift, document the date, the time of day the shift began and ended and the number or designation of the shift. During the review period, there were times when there were multiple entries made in the log book, but the entries were not signed off by the operator; therefore, it could not be identified who made the entry. In addition, the operating shift was not always identified.	January 17 2020	1.	This issue has already been corrected in Wonderware. Currently in the daily SCADA Actions Report for filter turbidity on the town SCADA, it shows a bit reading of 1 when the filters are discharging to the clear well and 0 when they are not. These readings are taken every 5 minutes; however it is uncertain by both programmer and operator whether that has been accounted for in the filter efficiency calculation. The operator reviews these readings daily on the excel spreadsheet developed by SCADA, and has a formula developed on the spreadsheet to account for only readings with a bit count of 1 (filtered water to Clear well). This provides and accurate turbidity reading daily for each filter. That value is posted on a data collection sheet and utilized to calculate how many readings were above 0.3 NTU for the day on that filter, effectively representing filter efficiency. The data is collected for the month and cross referenced with Wonderware for a month end filter efficiency value. Peter Chung (Sealog) has been away and will verify/correct the SCADA calculation to remove bit 2 (no filter water to clear well) by the end of the month) In the meantime, operators will continue the daily review and calculation as required	In Progress In Progress

		from town SCADA data. 2. The facility Operators have been signed up for Logbook training through OCWA and have until February 9th 2020 to complete. The Operators will be provided a training certificate once completed. The logbooks will be reviewed bi-weekly, with the provisions of feedback to Operators/Manager. Emo WTP will be running a trial on electronic logbooks which will benefit many things: legibility, entries cannot be made until an ORO/OIC is assigned, All entries are time stamped and electronically signed at the time of entry completion, and also is accessible to be reviewed remotely by Manager/ORO.

On July 21 2019 the gas chlorination system failed and leaked chlorine. The municipal fire department attended the water plant to contain the gas leak. The gas chlorination system was shut down and an alternate chlorination system established to maintain disinfection using sodium hypochlorite. The alternate system remains in operation as the municipality explores changing permanently to the sodium hypochlorite system.

Section 5: Conclusion

In the reporting year of 2020, there were two adverse water quality incident (AWQI) reports filed as summarized in the table below.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
20-Jul-2020	Presence of total coliform in a distribution sample.	Present	p/a/100mL	Resample	04-Aug-2020
01-Dec-2020	Water main break	-	-	Repair leak in water main, collect two (2) sets of bacteriological samples from affected residences.	08-Dec-2020

For the operating year of 2020, the Emo Drinking-Water System was able to meet the demand of water use within the town without exceeding the Permit to Take Water but exceeded the Municipal Drinking Water Licence and Permit.