
Mohawks of the Bay of Quinte

Annual Water Report

Reporting period of January 1, 2019 – December 31, 2019

Prepared For:

Mohawks of the Bay of Quinte

Prepared By:



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

This report has been prepared to satisfy the annual reporting requirements of the Provincial Regulations and Guidelines established by the Ministry of the Environment in the Province of Ontario including the section 11 and Schedule 22 reports identified in O.Reg 170/03, Drinking Water Systems Regulation and the Permit to Take Water Reports identified in O.Reg 387/04, Water Taking and Transfer Regulation.

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Mohawks of the Bay of Quinte Water Treatment Facility

Facility Description & Treatment Process

The Mohawks of the Bay of Quinte Water Treatment Facility is a surface water membrane filtration plant with a submerged low-pressure ultrafiltration membrane system. The *Low Lift System* transfers raw water from the Bay of Quinte to feed the water treatment plant; it will be controlled according to the level in the Pretreatment System. Treatment consists of Pre-Treatment Clarifiers, Dissolved Air Flotation (DAF) and membrane filtration system, followed by granular activated carbon filter, followed by an ultraviolet disinfection system, with chemical disinfection and pumping system. This facility is Federally funded and operated, therefore it does not fall under Provincial legislation. However, OCWA does provide oversight of the system as if it is regulated under Ontario Regulation 170/03. The Mohawks of the Bay of Quinte Water Treatment Facility would be considered a Large Municipal Residential system under this legislation; therefore this system is classified as a Large Municipal Residential system.

Treatment Chemicals used during the reporting period:

Chemical Name
• Citric Acid
• Phosphoric Acid
• Calcium Thiosulphate
• Sodium Hypochlorite – 12%
• Carbon Dioxide
• Kemira XL-54 PAC
• Ammonium Sulphate

Operational & Maintenance Summary

- Routine operations, sampling, testing and required system maintenance completed.
- All samples were collected as per Ontario Regulation 170/03.
- All alarms tested and signals confirmed with applicable alarm monitoring.

Performance Data

All Total Coliform and E.Coli samples collected at the Mohawks of the Bay of Quinte Water Treatment Facility during the reporting period were submitted to Eurofins laboratory for analysis, and all chemical samples collected for analysis are submitted to ALS Global Ltd, with the exception of in-house chlorine residuals, pH and turbidity. Eurofins and ALS Global have been deemed accredited by the Canadian Association for Laboratory Accreditation (CALA), meeting strict provincial guidelines including an extensive quality assurance/quality control program. The free chlorine residuals, pH and turbidity parameters were analyzed in the field at the time of sample collection by certified and trained operators, to ensure accuracy and precision of the results obtained. Sampling was conducted in accordance with Ontario Regulation 170/03.

Ontario Regulation 170/03 requires the following microbiological sampling:

- Weekly sample for raw water source to be tested for Total Coliform and E. Coli;
- Nine distribution samples to be tested monthly for Total Coliforms, E. Coli and HPC.

Tabulated below is a summary of all microbiological testing completed during the reporting period.

<u>Mohawks of the Bay of Quinte Water Treatment Facility - Microbiological Test Results</u>							
Sample Location	# Total Coliform and E. Coli Samples	Total Coliform (CFU/100 mL) – Range of Results (min#) – (max#)	E. Coli (CFU/100 mL)– Range of Results (min#) – (max#)	Exceedance	# HPC Samples	HPC (CFU/1 mL) – Range of Results (min#) – (max#)	Exceedance
Raw Water	46	0-174	0-1	Not Applicable	1	Not Applicable	Not Applicable
Treated Water	46	0-0	0-0	NO	32	0-11	Not Applicable
Distribution Water – (Various Locations)	115	0-12	0-0	NO	84	0-43	Not Applicable

Tabulated below is a summary of the Performance Criterion for filtered water turbidity in percent of the measurements each month during the reporting period. The Mohawks of the Bay of Quinte WTF uses membrane filtration and therefore, must remain under 0.10 NTU 99% of the time.

<u>Mohawks of the Bay of Quinte WTF – Filter Turbidity</u>		
Sample Parameter & Location	Filter #1	Filter #2
2019 Average	<.10 NTU at %100	<.10 NTU at %100

Tabulated below is a summary of Raw Water flows from the Bay of Quinte for the reporting period.

<u>Mohawks of the Bay of Quinte WTF – Raw Water Flow</u>				
Month	Total Flow m3	Minimum m3/day	Maximum m3/day	Average m3/day
January	8,348	47	455	269
February	6,345	47	441	328
March	8,483	0.01	1,643	858
April	5,929	0.86	1,671	932
May	8,297	0.86	1,629	853
June	10,349	0.86	1,609	800
July	11,828	0.86	1,887	814

August	9,647	0.86	1,894	903
September	9,805	119	471	330
October	9,298	0	1,876	854
November	7,312	0	1,582	935
December	7,302	0	1,577	937
Total	102,943			
Minimum		0		
Maximum			1,894	
Average				734

Tabulated below is a summary of Treated Water Flows for the reporting period.

<u>Mohawks of the Bay of Quinte WTF – Treated Water Flow</u>				
	Total Flow m3	Minimum m3/day	Maximum m3/day	Average m3/day
January	3,812	8	226	123
February	3,778	25	285	135
March	4,754	0	6,218	251
April	2,281	0	4,650	393
May	4,081	0	7,260	293
June	4,754	0	6,218	180
July	6,189	0	5,443	222
August	6,984	0	6,767	293
September	5,480	0	8,638	320
October	4,886	0	7,696	304
November	3,588	0	6,613	285
December	4,109	0	6,544	241
Total	49,221			
Minimum		0		
Maximum			8,638	
Average				253

*The raw water flows are occasionally higher than the treated water flows due the water used to perform backwashes on the DAF and Ultrafiltration system.

Tabulated below is a summary of in-house analytical testing performed during sampling in the Mohawks of the Bay of Quinte Drinking Water System for the reporting period.

<u>Mohawks of the Bay of Quinte WTF – - In-House Test Results</u>		
Sample Parameter & Location	# of Grab Samples	Range of Results (min#) – (max#)
Turbidity (NTU)- Raw Water	8760	0.23-60.0
pH- Raw Water	229	5.83-7.28
Free Chlorine Residual (mg/L) – Treated Water	8760	0.22-5.00
Turbidity (NTU)- Treated Water	8760	0.04-2.00
pH-Treated Water	235	6.57-7.69

*Instrument spikes and dips recorded by on-line instrumentation were a result of air bubbles and various maintenance and calibration activities. Power interruptions may also cause an instrument reading to drop to zero. All events are reviewed for compliance with O. Reg. 170/03 and if warranted, are reported to the Ministry of Environment as Adverse Water Quality Incidents

Ontario Regulation 170/03 requires the following chemical testing to be performed:

- One treated water sample every three months to be tested for nitrite and nitrate;
- One distribution sample every three months to be tested for THM and HAA
- One treated water sample every 12 months to be tested for every parameter listed in Schedules 23 and 24; and
- One treated water sample every 60 months to be tested for sodium and fluoride.

Tabulated below is a summary of all chemical sample results for the reporting period.

<u>MBQ WTF -- Chemical Test Results</u>				
Sample Parameter	# of Samples	Distribution Community Well-being Centre– 2019 Average Result(ug/L)	ODWS Objective (Type)	Exceedance
Nitrite (N) - mg/L	4	<0.013	1 (MAC)	No
Nitrate (N) – mg/L	4	<0.052	10 (MAC)	No
Nitrite + Nitrate (N) – mg/L	4	<0.049	10 (MAC)	No
THM's Total – ug/L	4	23.70	100 (MAC) *	No
HAA Total – ug/L	4	16.02	80 (MAC)	No

MAC = Maximum Acceptable Concentration, *expressed as a running annual average

Schedule 23 & 24 - Organic and Inorganic Parameter Results

Tabulated below is a summary of all Schedule 23 & 24 sample results for the reporting period.

<u>MBQ WTF --Test Results</u>					
Parameter	Units	Sample Date	Result Value	Objective	Exceedance (Yes/No)
Antimony (Sb)	ug/L	2019-03-26	<0.60	6.0	N
Arsenic (As)	ug/L	2019-03-26	<1.0	25.0	N
Barium (Ba)	ug/L	2019-03-26	35	1000.0	N
Boron (B)	ug/L	2019-03-26	<50	5000.0	N
Cadmium (Cd)	ug/L	2019-03-26	<0.10	5.0	N
Chromium (Cr)	ug/L	2019-03-26	<1.0	50.0	N
Selenium (Se)	ug/L	2019-03-26	<5.0	50.0	N
Uranium (U)	ug/L	2019-03-26	<5.0	20.0	N
Mercury	ug/L	2019-03-26	<0.10	1.0	N
Benzene	ug/L	2019-03-26	<0.50	1.0	N

Carbon tetrachloride	ug/L	2019-03-26	<0.20	2.0	N
Monochlorobenzene	ug/L	2019-03-26	<0.50	80.0	N
1,2-Dichlorobenzene	ug/L	2019-03-26	<0.50	200.0	N
1,4-Dichlorobenzene	ug/L	2019-03-26	<0.50	5.0	N
1,2-Dichloroethane	ug/L	2019-03-26	<0.50	5.0	N
1,1-dichloroethylene (vinylidene chlorid	ug/L	2019-03-26	<0.50	14.0	N
Dichloromethane	ug/L	2019-03-26	<5.0	50.0	N
Ethylbenzene	ug/L	2019-03-26	<0.50	140.0	N
Tetrachloroethylene (perchloroethylene)	ug/L	2019-03-26	<0.50	10.0	N
Toluene	ug/L	2019-03-26	<0.50		
Trichloroethylene	ug/L	2019-03-26	<0.50	5.0	N
Vinyl chloride	ug/L	2019-03-26	<0.20	1.0	N
o-xylene	ug/L	2019-03-26	<0.50		
m/p-xylene	ug/L	2019-03-26	<1.0		
Xylenes (Total)	ug/L	2019-03-26	<1.5	90.0	N
4-Bromofluorobenzene	%	2019-03-26	102.8		
1,4-Difluorobenzene	%	2019-03-26	103.1		
Aroclor 1242	ug/L	2019-03-26	<0.020		
Aroclor 1254	ug/L	2019-03-26	<0.020		
Aroclor 1260	ug/L	2019-03-26	<0.020		
Total PCBs	ug/L	2019-03-26	<0.035	3.0	N
d14-Terphenyl	%	2019-03-26	83.3		
alpha-Chlordane	ug/L	2019-03-26	<0.10		
gamma-Chlordane	ug/L	2019-03-26	<0.10		
p,p-DDD	ug/L	2019-03-26	<0.10		
p,p-DDE	ug/L	2019-03-26	<0.10		
o,p-DDT	ug/L	2019-03-26	<0.10		
p,p-DDT	ug/L	2019-03-26	<0.10		
Oxychlordane	ug/L	2019-03-26	<0.10		
d14-Terphenyl	%	2019-03-26	85.1		
Bromoxynil	ug/L	2019-03-26	<0.20	5.0	N
2,4-D	ug/L	2019-03-26	<0.20	100.0	N
Dicamba	ug/L	2019-03-26	<0.20	120.0	N
Glyphosate	ug/L	2019-03-26	<5.0	280.0	N
MCPA	ug/L	2019-03-26	<0.20	100.0	N
Picloram	ug/L	2019-03-26	<0.20	190.0	N
2,4-Dichlorophenylacetic Acid	%	2019-03-26	145		

Alachlor	ug/L	2019-03-26	<0.10	5.0	N
Atrazine	ug/L	2019-03-26	<0.10		
Atrazine & Metabolites	ug/L	2019-03-26	<0.20	5.0	N
Azinphos-methyl	ug/L	2019-03-26	<0.10	20.0	N
Benzo(a)pyrene	ug/L	2019-03-26	<0.010	0.01	N
Carbaryl	ug/L	2019-03-26	<0.20	90.0	N
Carbofuran	ug/L	2019-03-26	<0.20	90.0	N
Chlorpyrifos	ug/L	2019-03-26	<0.10	90.0	N
Diazinon	ug/L	2019-03-26	<0.10	20.0	N
2,4-Dichlorophenol	ug/L	2019-03-26	<0.30	900.0	N
Dimethoate	ug/L	2019-03-26	<0.10	20.0	N
Diquat	ug/L	2019-03-26	<1.0	70.0	N
Diuron	ug/L	2019-03-26	<1.0	150.0	N
Atrazine Desethyl	ug/L	2019-03-26	<0.10		
Malathion	ug/L	2019-03-26	<0.10	190.0	N
Diclofop-methyl	ug/L	2019-03-26	<0.20	9.0	N
Metolachlor	ug/L	2019-03-26	<0.10	50.0	N
Metribuzin	ug/L	2019-03-26	<0.10	80.0	N
Paraquat	ug/L	2019-03-26	<1.0	10.0	N
Pentachlorophenol	ug/L	2019-03-26	<0.50	60.0	N
Phorate	ug/L	2019-03-26	<0.10	2.0	N
Prometryne	ug/L	2019-03-26	<0.10	1.0	N
Simazine	ug/L	2019-03-26	<0.10	10.0	N
Terbufos	ug/L	2019-03-26	<0.20	1.1	N
2,3,4,6-Tetrachlorophenol	ug/L	2019-03-26	<0.50	100.0	N
Triallate	ug/L	2019-03-26	<0.10	230.0	N
2,4,6-Trichlorophenol	ug/L	2019-03-26	<0.50	5.0	N
2-Fluorobiphenyl	%	2019-03-26	68.4		
Trifluralin	ug/L	2019-03-26	<0.10	45.0	N

Ontario Regulation 170/03 – Specifies requirements for sampling and testing for lead as follows:

- 10 Plumbing Samples must be collected twice per year(Summer and Winter)

Tabulated below is a summary of the lead sampling results obtained during the reporting period.

<u>Quinte Mohawks School –Plumbing Lead Sample Results –</u> July 31,2018			
Location	Sample Parameter- Lead – ug/L	ODWS Objective (Type)	Exceedance

N/A*

**This system is exempt from plumbing sampling for lead. This system must collect distribution pH and alkalinity samples under the reduced sampling table during each sampling period in every 12 month period and distribution lead samples under the reduced sampling table during each sampling period in every third 12-month period.*

Blue-Green Algae

	Raw	Treated
Lowest Analytical Detection Limit (ALS)		0.1 ug/L
Guideline Limit	N/A	1.50 ug/L
Date	Result (ug/L)	
03-Jun-19	<0.10	<0.10
10-Jun-19	<0.10	<0.10
17-Jun-19	<0.10	<0.10
2-Jul-19	0.18	<0.10
8-Jul-19	<0.10	<0.10
15-Jul-19	<0.10	<0.10
22-Jul-19	0.54	<0.10
19-Aug-19	0.31	<0.10
26-Aug-19	0.89	<0.10
3-Sept-19	0.67	<0.10
16-Sept-19	0.10	<0.10
23-Sept-19	0.10	<0.10
26-Sept-19	0.10	<0.10
Oct. 7 2019	<0.1	<0.10
Oct. 15 2019	<0.1	<0.10
Oct. 21 2019	0.50	<0.10
Oct. 28 2019	<0.1	<0.10

Compliance Summary

From the results tabulated in the previous section, sample results obtained during the reporting period were within the Ontario Drinking Water Quality Objective. No samples taken exceeded the Maximum Acceptable Concentration (MAC) and therefore deemed to be in compliance with O.Reg 170/03.

Alarm Response & Overtime Summary

- Generator Alarm, power glitch- reset alarms, turned on cells to membrane
- Water production not ready- GAC's drained. Cell #7 on evoqua, stuck in backwash. High turbidity in cell #1- switched to cell #2.
- Water production not ready- GAC's drained- high turbidity on membrane cell #1
- Water production not ready- mp7606 chemical pumps fail to start and lock out- reset
- Water production not ready- mp7606 chemical pumps fail to start and lock out- reset
- system pressure fail- VFO issue- unable to reset- pump working fine
- Power brown out caused alarms at plant and CWB sewage lift station

- System Pressure Alarm, Evoqua Alarm High Turbidity.
- System Pressure Alarm, Evoqua Alarm. Evoqua Alarm valve stuck closed
- Water Production Not Ready Alarm, lost signal to Low Lift Station. Evoqua Alarm valve stuck open.
- Evoqua Filter Alarm, AV004 Fail to Open

Capital Expenditures Summary

- Annual diesel inspection
- Annual fire extinguisher inspections
- Annual backflow preventers inspection
- Flowmeter calibration
- Two 273 Kilo drums of Citric Acid
- 2910 Kg CO2 delivery
- Syntec service call and solenoid 3 way brass valve body for Singer valve
- 2 packs of filter paper for Lab room
- Air filters for HVAC units
- pH sensor probe
- Free chlorine sensor
- Compressor inspection and moisture relief valve rebuild kit
- New sewage pump for C.W.B
- New Shower for washroom
- Curb stop repair
- Cleaning of 7 mini lift stations on Bayshore Rd.
- Window cleaning at plant

~~~Prepared for the Mohawks of the Bay of Quinte by the Ontario Clean Water Agency~~~