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# Mohawks of the Bay of Quinte

## Annual Water Report

Reporting period of January 1, 2018 – December 31, 2018

Prepared For:

Mohawks of the Bay of Quinte

Prepared By:



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

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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:**

<b>Chemical Name</b>
<ul style="list-style-type: none"><li>• Citric Acid</li></ul>
<ul style="list-style-type: none"><li>• Phosphoric Acid</li></ul>
<ul style="list-style-type: none"><li>• Calcium Thiosulphate</li></ul>
<ul style="list-style-type: none"><li>• Sodium Hypochlorite – 12%</li></ul>
<ul style="list-style-type: none"><li>• Carbon Dioxide</li></ul>
<ul style="list-style-type: none"><li>• Kemira XL-54 PAC</li></ul>
<ul style="list-style-type: none"><li>• Ammonium Sulphate</li></ul>

### ***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.

During the reporting period, all operations and maintenance is carried out by Mohawks of the Bay of Quinte staff and overseen by Ontario Clean Water Agency/ORO.

### 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	52	0-1100	0-14	Not Applicable	52	0->500	Not Applicable
Treated Water	52	0-0	0-0	NO	52	0-11	Not Applicable
Distribution Water – (Various Locations)	180	0-12	0-0	NO	180	0-16	Not Applicable

**Note:** During the 4<sup>th</sup> quarter of 2018 no HPC samples were collected at the request of the First Nations and Inuit Health Branch. To maintain the classification of the water treatment and distribution systems according to Regulation 170/03, HPC samples are required to be collected within the distribution system. In discussions with the Mohawks of the Bay of Quinte it has been decided the HPC samples will be collected and cost will be covered by the MBQ Band.

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
2018 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	9,948	145	2878	622
February	5,898	151	698	310
March	5,762	115	567	288
April	6,315	142	986	351
May	7,543	161	1,029	359
June	7,262	175	676	382
July	13,208	172	713	399
August	11,562	154	742	343
September	9,805	119	471	330
October	9,818	85	473	317
November	7,107	44	386	229
December	7,747	49	414	242
<b>Total</b>	<b>101,975</b>			
<b>Minimum</b>		<b>44</b>		
<b>Maximum</b>			<b>2878</b>	
<b>Average</b>				<b>384</b>

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	4,962	22	1802	331
February	1,860	48	186	98
March	1,779	40	174	89
April	1,823	35	234	101
May	2,942	54	334	140
June	2,894	65	324	152
July	7,360	70	400	228
August	7,078	117	722	210
September	5,965	112	297	202
October	5,523	103	248	178
November	2,208	7	126	71
December	2,505	4	192	78
<b>Total</b>	<b>46,899</b>			
<b>Minimum</b>		<b>4</b>		
<b>Maximum</b>			<b>1802</b>	
<b>Average</b>				<b>157</b>

\*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.

<b><u>Mohawks of the Bay of Quinte WTF -- In-House Test Results</u></b>		
<b>Sample Parameter &amp; Location</b>	<b># of Grab Samples</b>	<b>Range of Results (min#) – (max#)</b>
<b>Turbidity (NTU)- Raw Water</b>	248	0.13-60.0
<b>pH- Raw Water</b>	248	6.12-7.68
<b>Free Chlorine Residual (mg/L) – Treated Water</b>	248	0.19-5.00
<b>Turbidity (NTU)- Treated Water</b>	248	0.03-2.00
<b>pH-Treated Water</b>	248	6.69-7.81
<b>Free Chlorine Residual (mg/L) – Distribution Water – Various Locations</b>	432	0.34-3.90

\*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.

<b><u>MBQ WTF -- Chemical Test Results</u></b>				
<b>Sample Parameter</b>	<b># of Samples</b>	<b>Distribution Community Well-being Centre– 2018 Average Result(ug/L)</b>	<b>ODWS Objective (Type)</b>	<b>Exceedance</b>
<b>Nitrite (N) - mg/L</b>	4	0.13	1 (MAC)	No
<b>Nitrate (N) – mg/L</b>	4	0.17	10 (MAC)	No
<b>Nitrite + Nitrate (N) – mg/L</b>	4	0.14	10 (MAC)	No
<b>THM’s Total – ug/L</b>	4	14.48	100 (MAC) *	No
<b>HAA Total – ug/L</b>	4	8.78	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.

<b>MBQ WTF --Test Results</b>					
<b>Parameter</b>	<b>Units</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Objective</b>	<b>Exceedance (Yes/No)</b>
(DDT) + Metabolites	ug/L	2018-03-21	<0.024	30	No
2,3,4,6-tetrachlorophenol	ug/L	2018-03-21	<1.0	100	No
2,4,5-trichlorophenoxyacetic acid (2,4,5-T)	ug/L	2018-03-21	<1.0	280	No
2,4,6-trichlorophenol	ug/L	2018-03-21	<1.0	5	No
2,4-dichlorophenol	ug/L	2018-03-21	<0.2	900	No
2,4-dichlorophenoxyacetic acid (2,4-D)	ug/L	2018-03-21	<1.0	100	No
a-chlordane	ug/L	2018-03-21	<0.006		
Alachlor	ug/L	2018-03-21	<0.5	5	No
Aldicarb	ug/L	2018-03-21	<9	9	No
Aldrin	ug/L	2018-03-21	<0.006		
Aldrin + Dieldrin	ug/L	2018-03-21	<0.012	0.07	No
Atrazine	ug/L	2018-03-21	<1.0		
Atrazine + N-dealkylated metabolites	ug/L	2018-03-21	<1.0	5	No
Azinphos-methyl	ug/L	2018-03-21	<2.0	20	No
Bendiocarb	ug/L	2018-03-21	<2.0	40	No
Benzo(a)pyrene	ug/L	2018-03-21	<0.01	0.01	No
Bromoxynil	ug/L	2018-03-21	<0.5	5	No
Carbaryl	ug/L	2018-03-21	<5.0	90	No
Carbofuran	ug/L	2018-03-21	<5.0	90	No
Chlordane (Total)	ug/L	2018-03-21	<0.018	7	No
Chlorpyrifos	ug/L	2018-03-21	<1.0	90	No
Cyanazine	ug/L	2018-03-21	<1.0	10	No
De-ethylated atrazine	ug/L	2018-03-21	<1.0		
Diazinon	ug/L	2018-03-21	<1.0	20	No
Dicamba	ug/L	2018-03-21	<1.0	120	No
Diclofop-methyl	ug/L	2018-03-21	<0.9	9	No

Dieldrin	ug/L	2018-03-21	<0.006		
Dimethoate	ug/L	2018-03-21	<2.5	20	No
Dinoseb	ug/L	2018-03-21	<1.0	10	No
Diquat	ug/L	2018-03-21	<5	70	No
Diuron	ug/L	2018-03-21	<10	150	No
Gamma-BHC (Lindane)	ug/L	2018-03-21	<0.006		
g-chlodane	ug/L	2018-03-21	<0.006		
Glyphosate	ug/L	2018-03-21	<10	280	No
Heptachlor + Heptachlor Epoxide	ug/L	2018-03-21	0.012		
Heptachlor Epoxide	ug/L	2018-03-21	<0.006	3	No
Malathion	ug/L	2018-03-21	<5.0		
Methoxychlor	ug/L	2018-03-21	<0.006	190	No
Metolachlor	ug/L	2018-03-21	<1.0	900	No
Metribuzin	ug/L	2018-03-21	<5.0	50	No
Op-DDT	ug/L	2018-03-21	<0.006	80	No
Oxychlorthane	ug/L	2018-03-21	<0.006		
Paraquat	ug/L	2018-03-21	<1		
Parathion	ug/L	2018-03-21	<1.0	10	No
Pentachlorophenol	ug/L	2018-03-21	<1.0	50	No
Phorate	ug/L	2018-03-21	<0.5	60	No
Picloram	ug/L	2018-03-21	<5.0	2	No
pp-DDD	ug/L	2018-03-21	<0.006	190	No
pp-DDE	ug/L	2018-03-21	<0.006		
pp-DDT	ug/L	2018-03-21	<0.006		
Prometryne	ug/L	2018-03-21	<0.25	1	No
Simazine	ug/L	2018-03-21	<1.0	10	No
Temephos	ug/L	2018-03-21	<10	280	No
Terbufos	ug/L	2018-03-21	<0.4	1	No
Triallate	ug/L	2018-03-21	<1.0	230	No
Trifluralin	ug/L	2018-03-21	<1.0	45	No
Mercury	mg/L	2018-03-21	<0.0001	0.001	No
Antimony	mg/L	2018-03-21	<0.0005	0.001	No
Arsenic	mg/L	2018-03-21	<0.001	0.006	No
Barium	mg/L	2018-03-21	0.04	0.025	No
Boron	mg/L	2018-03-21	0.02	1	No



Cadmium	mg/L	2018-03-21	<0.0001	5	No
Chromium	mg/L	2018-03-21	<0.0001		
Uranium	mg/L	2018-03-21	<0.001	0.005	No
1,1 – dichloroethylene	mg/L	2018-03-21	<0.5	0.05	No
1,2 – dichlorobenzene	mg/L	2018-03-21	<0.4	1	No
1,2 – dichloroethane	mg/L	2018-03-21	<0.2	0.3	No
1,4 – dichlorobenzene	mg/L	2018-03-21	<0.4	0.01	No
Carbon Tetrachloride	mg/L	2018-03-21	<0.2		
Dichloromethane	mg/L	2018-03-21	<4.0	0.05	No
Monochlorobenzene	mg/L	2018-03-21	<0.5	0.01	No
Tetrachloroethylene	mg/L	2018-03-21	<0.3		
Trichloroethylene	mg/L	2018-03-21	<0.3	200	No
Vinyl Chloride	mg/L	2018-03-21	<0.2	0.02	No

***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.

<b><i>Quinte Mohawks School –Plumbing Lead Sample Results – July 31,2018</i></b>			
<b>Location</b>	<b>Sample Parameter- Lead – ug/L</b>	<b>ODWS Objective (Type)</b>	<b>Exceedance</b>
<b>Adult Language School S</b>	1.40 ug/L	10 ug/L (MAC)	No
<b>Adult Language School F</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 42 Standard Water</b>	1.90 ug/L	10 ug/L (MAC)	No
<b>Hydrant 43 Flushed Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 38 Standard Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 38 Flushed Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 13 Standard Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 13 Flushed Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 1 Standard Water</b>	<1.00 ug/L	10 ug/L (MAC)	No
<b>Hydrant 1 Flushed Water</b>	<1.00 ug/L	10 ug/L (MAC)	No

## 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-Jul-18	<0.10	<0.10
09-Jul-18	0.46	<0.10
16-Jul-18	0.80	<0.10
23-Jul-18	0.44	<0.10
30-Jul-18	0.57	<0.10
07-Aug-18	0.13	<0.10
13-Aug-18	1.20	<0.10
27-Aug-18	2.30	<0.10
04-Sept-18	1.20	<0.10
10-Sept-18	1.00	<0.10
17-Sept-18	1.80	<0.10
01-Oct-18	0.32	<0.10
09-Oct-18	0.15	<0.10
22-Oct-18	<0.10	<0.10
29-Oct-18	<0.10	<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*

- Extra distribution samples collect on Norway's road – new water mains installed to homes
- Failed electric valve for filtration system preventing water production – On site and reset valve
- Evoqua pneumatic valve stuck in close position – adjust valve settings to allow it to work properly
- Low chlorine residual in distribution leaving the plant. This was due to low water consumption in the distribution system. The chlorine residual out in the distribution system supplying the system, homes had an acceptable residual.
- Low chlorine residual in distribution leaving the plant due to a chlorine pump malfunction. Pump was repaired and chlorine residual restored. The chlorine residual out in the distribution system supplying the system, homes had an acceptable residual.
- Evoqua pneumatic valve stuck in close position – adjust valve settings to allow it to work properly
- Evoqua pneumatic valve – adjust valve settings to allow it to work properly

### ***Capital Expenditures Summary***

- Hatfield Electric on site to disconnect mixer at water plant
- Mixer pump assembly removed for repairs – pre-storage tank
- UPS for water fill station
- Annual diesel generator inspection and service
- Replacement of failing valve for the Evoqua system

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