
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:

| 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.

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 4th 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 |
| | | | | |
| Total | 101,975 | | | |
| Minimum | | 44 | | |
| Maximum | | | 2878 | |
| Average | | | | 384 |

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 |
| | | | | |
| Total | 46,899 | | | |
| Minimum | | 4 | | |
| Maximum | | | 1802 | |
| Average | | | | 157 |

*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 | 248 | 0.13-60.0 |
| pH- Raw Water | 248 | 6.12-7.68 |
| Free Chlorine Residual (mg/L) – Treated Water | 248 | 0.19-5.00 |
| Turbidity (NTU)- Treated Water | 248 | 0.03-2.00 |
| pH-Treated Water | 248 | 6.69-7.81 |
| Free Chlorine Residual (mg/L) – Distribution Water – Various Locations | 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.

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

| <u>MBQ WTF --Test Results</u> | | | | | |
|---|--------------|--------------------|---------------------|------------------|----------------------------|
| Parameter | Units | Sample Date | Result Value | Objective | Exceedance (Yes/No) |
| (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 |
| Oxychlordane | 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 | 00.1 | 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.

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