ARNPRIOR WATER FILTRATION PLANT

ANNUAL SUMMARY REPORT

2018

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Introduction

The following annual summary report has been prepared to summarize the raw and treated water characteristics, as well as changes and improvements during 2018 at the Arnprior Water Filtration Plant. This report covers the period from January 1 to December 31, 2018.

Compliance with Terms and Conditions of the Certificate of Approval

The Town of Arnprior owns and operates the Water Filtration Plant (WFP), and complies with the terms and conditions of the Certificate of Approval issued to the WFP.

WFP Plant Changes and Improvements:

- New Ammonium Sulphate dosing pumps were installed.
- New Chlorinator controller was installed.

In accordance with Ontario Regulation 170/03, all required sampling and laboratory analysis of the raw and treated water is carried out in the plant laboratory and a certified contracted laboratory, which includes the quarterly sampling requirements.

Flow meters are calibrated annually by a third party, for flow measurement of the water taken from the Madawaska River and to the distribution system.

Continuous water quality analyzers with alarm systems are installed for chlorine residual, turbidity of filtered water and fluoride residual.

All operators are certified to the appropriate level, with ongoing training taking place throughout the year.

An operations manual is kept at the filtration plant and updated as required.

All chemicals used in the water treatment process meet AWWA and ANSI standards.

Non-Compliance with Terms and Conditions of the Certificate of Approval

None at this time.

Adverse Test Results and Other Problems

The following adverse test results were reported to the Ministry of Environment and Renfrew County Health Department:

- On 2018/02/06 a sample was taken in the distribution system that had a Total Coliform count of 1 Cfu/100 ml. The location was resampled upstream, downstream and at the location with no adverse results.

Water Production

The raw, treated, and backwash flows at the plant are measured using Endress + Hauser Electromagnetic flow meters, these meters are calibrated annually by the manufacturer.

Raw Water Production

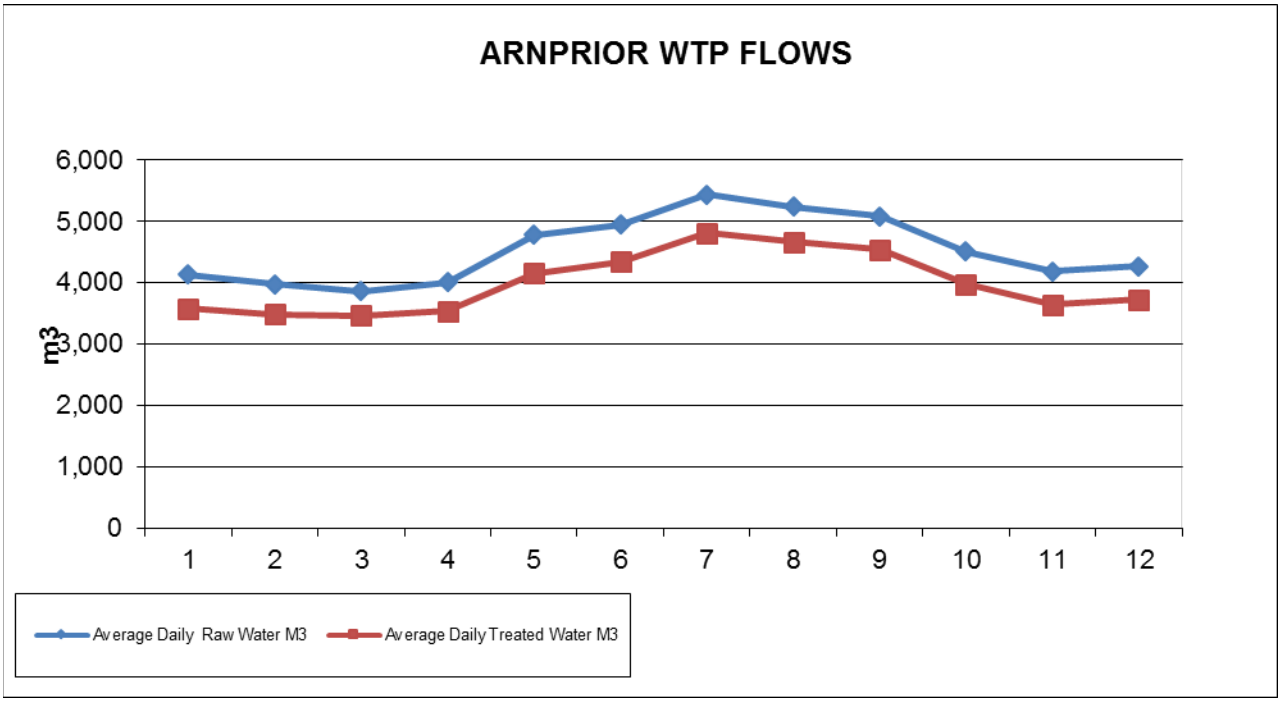
The average daily raw water flow was measured at 4,535 m^3. The maximum daily flow recorded was 6,229 m^3 on July 9, 2018. The total annual raw water flow for 2018 was 1,656,928 m^3.
This volume has decreased since 2017 which had a total flow of 1,869,503 m^3, a decrease of 212,575 m^3. The Town's current permit to take water from the Madawaska River is for 10,340 m^3 per day.

Treated Water Production

The Certificate of Approval for the WFP in 2018 is 10,340 m^3/day of raw water production. There were no flow rate exceedances in 2018, the average daily treated water flow was measured at 3,996 m^3/day. The maximum daily treated water flow was 5,852 m^3 on July 10, 2018. The total annual treated water flow for 2018 was 1,459,821 m^3. This volume has decreased since 2017 which had a total flow of 1,632,545 m^3, a decrease of 172,724 m^3. The per capita use of treated water is 454 litres per day, which is above the typical Canadian average of 300 – 400 litres per day, and is attributed to industrial use.

Backwash Water Consumption

The average daily backwash water flow was 310 m^3; the total annual backwash water flow was 113,294m^3. The backwash water is treated in a residuals treatment system where the solids are removed and pumped to the Water Pollution Control Centre (WPCC) for treatment, and the clear supernatant is pumped to the Madawaska River. The WFP Certificate of Approval stipulates a maximum Total Suspended Solids (TSS) of 25 mg/l in the supernatant and in 2018 the average TSS was 2.8 mg/l.



Flow Rate Exceedance

The WFP Certificate of Approval states a treatment process maximum of 10,340 m3 per day. There were no Flow Rate Exceedances.

Water Quality

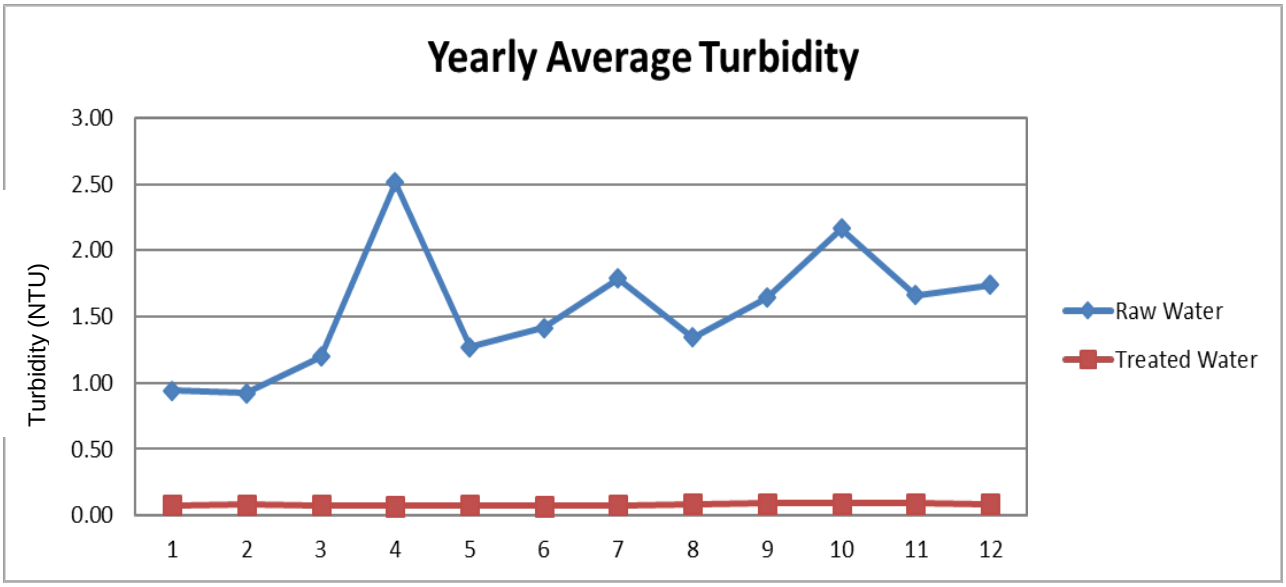
The Town of Arnprior carries out all the sampling and analysis of the raw and treated water as per the Ontario Drinking Water Standard guidelines. Certain parameters are done at different frequencies such as daily, weekly, monthly, and annually.

Zebra Mussel

Zebra mussels are evident at the Low Lift Pumphouse, at this time are manageable with routine cleaning of the intake screens.

Turbidity

The Madawaska River is an excellent source of potable water, with stable water turbidity. The chart shows the raw water turbidity along with the treated water turbidity. The MAC for filtered water is 0.3 NTU for 95% of the time, without exceeding 1.0 NTU. The 2018 average treated water turbidity was 0.08 NTU. The horizontal axis shows months 1 through 12 which correlate to January through December, the vertical axis shows turbidity measured in NTU.



Quarterly and Annual Water Sampling

Sampling and testing were carried out at various frequencies for Volatile Organic Compounds (VOCs), Inorganic compounds, Pesticides, and PCB. These samples are taken by plant operators and are sent to a certified contracted laboratory. The analytical results revealed that all samples collected were within acceptable concentrations under the Ontario Drinking Water Standard.

Hardness

The recommended operational guideline for hardness is 80mg/L to 100mg/L expressed as Calcium Carbonate ($CaCO_3$). This provides an acceptable balance between corrosion and incrustation. Hardness is caused by the presence of certain dissolved chemical compounds with calcium and magnesium being primary elements. The amount of hardness varies significantly depending on the source. The Arnprior raw water has an average hardness of 50 mg/L which would be considered soft water.

Alkalinity

Alkalinity is a measure of the capacity of water to neutralize acids and is also known as the buffering capacity. The recommended operational range for alkalinity in coagulant treated drinking water is 30mg/L to 500mg/L as $CaCO_3$. The Arnprior raw water has an average alkalinity of 43mg/L.

Fluoride

Hydrofluorosilicic acid is added to the treated water to attain an average fluoride residual in 2018 of 0.59 mg/L with a MAC of 1.5mg/L. The fluoride residual is monitored with an online analyzer and laboratory analysis.

Water Treatment Chemicals

The WTP uses Gas Chlorine, Polymer, Ammonium Sulphate (Chloramination), Polyaluminum Chloride(Coagulant), Sodium Carbonate (Soda Ash) Phosphoric Acid (Corrosion Control Plan) and Hydrofluorosilicic Acid (fluoride).

Conclusion

This report is available at the Arnprior Town Hall, 105 Elgin Street West, at the 3rd floor public works space. This report will also be presented to Members of Council for adoption.

For any further information on this report please call Michael Trumble at 613-623-4231 ext. 1834.

Respectfully,

Michael Trumble
Waterworks Supervisor