



Environmental Services MEMORANDUM

TO: MAYOR J. LEHMAN AND MEMBERS OF COUNCIL

FROM: S. COULTER, MANAGER OF WASTEWATER OPERATIONS

NOTED: J. THOMPSON, P. ENG., CMM IP III, PMP
DIRECTOR OF ENVIRONMENTAL SERVICES

R. FORWARD, MBA, M.SC., P. ENG.
GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT

M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RE: 2017 WASTEWATER TREATMENT FACILITY ANNUAL REPORT
FILE: A22-AN

DATE: APRIL 9, 2018

The purpose of this Memorandum is to apprise members of Council of the compliance status of the 2017 reporting year for the City of Barrie's Wastewater Treatment Facility (WwTF). Barrie's ECA (Environmental Compliance Approval) for the WwTF requires that the facility *Owner* (i.e. Council) report annually to the Ministry of Environment and Climate Change (MOECC) within 90 days of the end of the reporting period (calendar 2017). This Memo is confirmation that the Report for the year 2017 was submitted to the MOECC on March 29th, 2018 in keeping with requirements of the ECA. A copy of the 2017 Annual Report has been placed in the Councillor's Lounge for review.

The City of Barrie's WwTF is located at 249 Bradford Street and operates under the Ministry of the Environment's Amended Environmental Compliance Approval (ECA) No. 2377-ALXPQL dated July 7th, 2017.

Sewage treatment processes include:

- Mechanical bar screens and compactor;
- Fine sewage grinding;
- Grit removal;
- Primary settling;
- High purity oxygen activated sludge treatment;
- Secondary settling;
- Nitrification by rotating biological contactors;
- Sand filtration;
- Ultraviolet disinfection;
- Treated effluent is discharged to Kempenfelt Bay;
- Biosolids are separated from the liquid sewage and are processed through dual digestion of sludge (aerobic & anaerobic); and
- Methane gas generated from this process is 'scrubbed' and used for co-generation of heat and electricity to offset plant energy demands.

In 2017, an average daily flow of 50.7 mega litres per day (MLD) of sewage was treated; representing approximately 66.7% of the plant's rated capacity of 76 MLD. The maximum daily influent flow was 91.0 MLD on May 5th, 2017 due to heavy rains inflowing and/or infiltrating the sanitary collection system.



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The WwTF was in *full compliance with all effluent limits and loadings for 2017* as indicated in Reporting Section 12(5) (a) of the Annual Report. Over the reporting period the WwTF functioned exceptionally well, producing a high quality of treated effluent. It is important to note that when the quality of the raw sewage is compared to the quality of the final effluent discharged into Kempenfelt Bay, the Barrie WwTF achieved extremely high removal (98-99+%) efficiencies for all regulated parameters.

In 2017, the annual loading of phosphorous discharged from the Barrie WwTF to Kempenfelt Bay was 511 kg which is only 18% of the annual compliance loading of 2,774 kg. The final effluent phosphorous monthly average concentrations all met the 0.10 mg/L compliance limit for 2017 and the actual effluent annual average phosphorous concentration of 0.03 mg/L for 2017 equalled the lowest on record set in 2016 and fully met the Lake Simcoe Phosphorus Reduction Strategy limit of 0.10 mg/L. This extremely low average annual phosphorus concentration was achieved through a combination of altering the chemical coagulant addition point(s), rigorous and frequent monitoring (both a result of the municipality's focus and commitment to process optimization) and the fact that the plant is operating at an average of only 66.7% of its rated capacity resulting in low stress on our effluent filters whose primary purpose is phosphorous removal.

Notably, in 2017, a significant improvement was made with regard to further reducing ammonia effluent loadings. Ammonia, like phosphorus, is a nutrient which can cause eutrophication of receiving waters and is also toxic to fish. This improvement is attributed to adjustments to control parameters and the aforementioned change in chemical application. Improvements are represented graphically below.

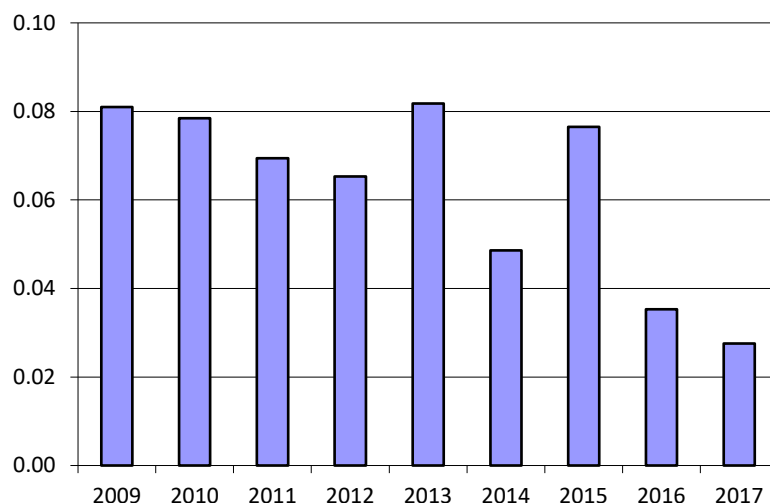


Figure 1 WwTF Final Effluent Total Phosphorus Concentration (mg/L)



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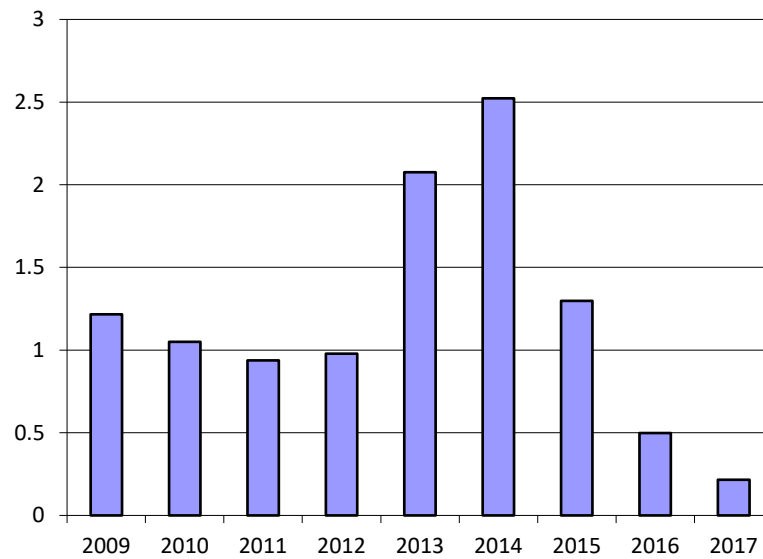


Figure 2 WwTF Final Effluent Ammonia Concentration (mg/L)

If you have any questions or require further information please contact Mr. Sandy Coulter, Manager of Wastewater Operations at extension 5826.