



ENVIRONMENTAL SERVICES DEPARTMENT MEMORANDUM

TO: MAYOR J. LEHMAN AND MEMBERS OF COUNCIL

FROM: S. COULTER, MANAGER OF WASTEWATER OPERATIONS

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

A. BOURRIE, RPP, GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT (ACTING)

M. PROWSE, CHIEF ADMINISTRATIVE OFFICER

RE: 2018 WASTEWATER FACILITY ANNUAL REPORTS - FILE: A22-AN

DATE: APRIL 15, 2019

The purpose of this Memorandum is to advise members of Council regarding the compliance status of the 2018 reporting year for three City-operated sewage facilities:

- the Barrie Wastewater Treatment Facility (WwTF);
- the Barrie Wastewater Collection System; and
- the Lake Simcoe Regional Airport System.

The Ministry of Environment, Conservation and Parks (MECP) governing Environmental Compliance Approvals (ECAs) for these facilities requires that the facility *Owner* (i.e. Council) report annually to the MECP within 90 days of the end of the reporting period (calendar 2018 – i.e. by March 31st, 2019). This Memo is confirmation that the completed Reports for the year 2018 were indeed submitted to MECP on March 29th, 2019 in keeping with requirements of the ECA. A copy of the 2018 Annual Reports, which have been submitted to MECP, have been placed in the Councillor's Lounge for Council's perusal.

Wastewater Treatment Facility, 249 Bradford Street

The City of Barrie's WwTF is located at 249 Bradford Street and operates under the MECP's Amended Environmental Compliance Approval (ECA) No. 0284-B2ML52 dated August 24th, 2018. Sewage treatment processes include mechanical bar screens and compactor, fine sewage grinding, grit removal, primary settling, high purity oxygen activated sludge treatment, secondary clarifiers, nitrification by rotating biological contactors, sand filtration and ultraviolet disinfection. Treated effluent is discharged to Kempenfelt Bay. Sludges are converted to biosolids after dual digestion of sludge (aerobic & anaerobic). In addition to using biosolids as a fertilizer on local farms, methane gas generated from this process is 'scrubbed' and used for co-generation of heat and electricity to offset plant energy demands.

In 2018, the effluent average daily flow (ADF) of 49.6 mega litres per day (MLD) of sewage represented approximately 65.2% of the plant's rated capacity of 76 MLD ADF. The maximum daily effluent flow was 91.3 MLD on February 20th, 2018 due to heavy rains, warm weather and spring runoff accessing the sanitary collection system over a 3-day period.

The WwTF was in full compliance with all required effluent concentration limits and loading limits. In addition, the plant met all ECA objectives with a few very minor exceptions. Over the reporting period the WwTF functioned exceptionally well, producing a high quality of treated effluent. The Barrie WwTF achieved extremely high removal efficiencies (98-99+%) for all regulated parameters such as nutrients (e.g. phosphorus and ammonia) BOD and TSS and has done so continuously since 2016. There were **no** spills or bypasses of sewage in 2018.

The 2018 final effluent phosphorous annual loading was 744 kg/year which is 27% of the permitted annual compliance loading of 2,774 kg. The effluent phosphorous monthly average concentrations met the 0.18 mg/L compliance limit for 2018. The actual effluent annual average phosphorous concentration of 0.04 mg/L for 2018 was among the lowest on record and fully met the Lake Simcoe Phosphorus Reduction Strategy limit of 0.10 mg/L. See Figure 1 for historical WwTF effluent phosphorus trending.

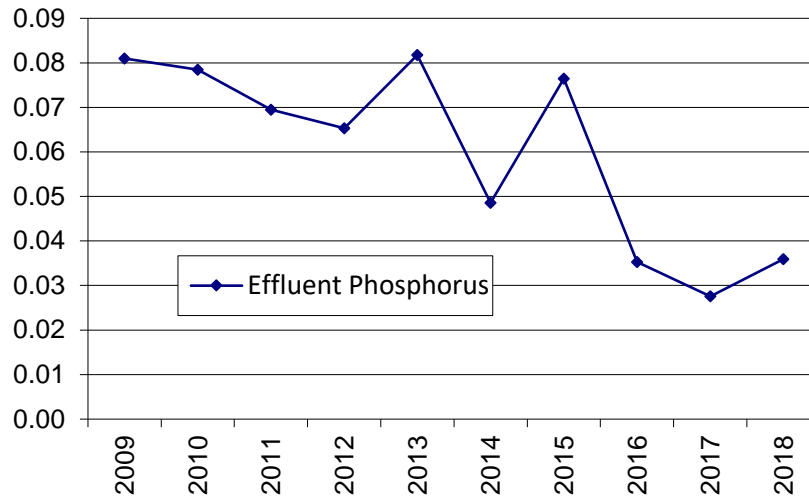


Figure 1 - WwTF Final Effluent Total Phosphorus Concentration (mg/L)

Ammonia, like phosphorus, is a nutrient which contributes to eutrophication of receiving waters and is also toxic to fish. Effluent ammonia levels were also among the lowest in recent record as shown in Figure 2.

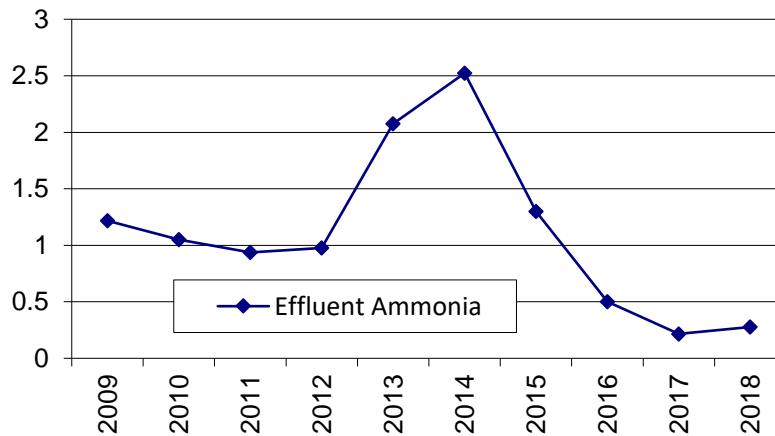


Figure 2 - WwTF Final Effluent Ammonia Concentration (mg/L)



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Wastewater Collection System

The City of Barrie owns and operates a wastewater collection system which feeds to and terminates at the Wastewater Treatment Facility located at 249 Bradford Street. The collection system currently operates under Ministry of the Environment and Climate Change Amended Environmental Compliance Approval (ECA) No. 5921-ATUKKR dated January 10th, 2018.

The adequacy of the existing system is generally sufficient.

Recently completed, in-development or in-progress improvements for wastewater pumping stations and force mains are as follows:

- Capacity is being increased and construction has started at Holly Pumping Station to accommodate annexed land;
- The twin force mains at Little Lake Pumping Station have been included in the original system-wide ECA but have not yet been tied into the existing sewer system. In 2019 the City of Barrie will apply for approval of a new valve chamber and possibly other modifications as needed to tie in the force mains; and
- Heritage Park Pumping Station performance is currently being evaluated with a focus on the capacity of the wet-well, sewage pumps and associated force main.

Only one spill of sewage occurred at a pumping station in 2018. The Heritage Park Pumping Station experienced a modest overflow on September 22nd, 2018. The details of the spill were reported to the MECP and site remediation was immediately completed in accordance with legislated requirements. Staff are currently conducting a condition assessment of the pumping station infrastructure.

The Roads, Stormwater and Rail Operations Branch of the Roads, Parks & Fleet Department operates and maintains the gravity portions of the wastewater collection system currently operating under Ministry of the Environment and Climate Change C Amended Environmental Compliance Approval (ECA) No. 5921-ATUKKR dated January 10th, 2018.

Throughout the 2018 calendar year, the following work was completed on the gravity collection system:

- 13 Insitu Repairs (various non-invasive technologies to repair sections of pipe below roadway);
- 24 re-built structures (mostly maintenance hole re-builds);
- Annual Sanitary Pipe Cleaning is undertaken by two City operated flushing crews, each responsible for 50% of the City. It is the goal to clean each local sanitary pipe in the City of Barrie every 2 to 3 years. Problem areas of the City are put on a Weekly Flushing Cycle which currently contains 15 problematic sections of sewer. City staff are required to clean some sewers weekly to allow for proper operating conditions. Two new problematic sections of sewer were added to the weekly flushing program and 4 problematic sections of sewer were removed from this list during the year;
- A new Sanitary Trunk Sewer Cleaning Program was initiated by City staff to commence cleaning and inspection of sanitary trunk sewers. 783 meters along the Ellen Street Sanitary Trunk Sewer and 615 meters of the Ellen Street Sanitary Trunk Sewer were cleaned;
- 12 sanitary laterals were replaced between the sanitary sewer main and the homeowner's property;
- 6 blocked gravity sewers were addressed and reported; and
- Roads, Stormwater and Rail Operations Branch actioned a total 178 service requests that were received from the public as part of the sanitary programming for the gravity collection system.



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Lake Simcoe Regional Airport

The City of Barrie Wastewater Operations Branch operates a private sewage works at the Lake Simcoe Regional Airport (LSRA) located at 224 Line 7 North of Oro-Medonte Township. On September 27th, 2016 MOECC issued Amended Environmental Compliance Approval No. 3223-ADYKC4 for the operation of two separate treatment systems; one for the terminal building, maintenance building and older hangars and one for a new hangar. The treatment systems generally consist of septic tanks, pump stations, force mains and diffuser bed systems and, in the case of the new hangar, a Waterloo Biofilter (WBF) system. The WBF is a small biological sewage treatment device that can achieve secondary treatment levels of performance. In 2018 the WBF generally met the treatment objectives stipulated in the in ECA approval.

The treatment systems described are intended for small volumes of sewage. Historically extraneous sources of water such as infiltration, inflow or even a running toilet can result in an exceedance of the design capacity of the systems. The Wastewater Operations Branch and the LSRA have invested considerable time and effort in excluding these sources of water. In spite of best efforts, the daily flow design capacity of the older system was exceeded in the last week of February, 2018. This will be addressed in 2019 by adding a remote monitoring capability to ensure that exceedances are detected promptly and traced to source.

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