CANA WASTEWATER TREATMENT PLANT

2021 ANNUAL REPORT

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

ECA #4021-9WUKDE was issued on July 22, 2015, for the newly constructed Wastewater Treatment Plant (WWTP) replacing the previous ECA for the 44-year-old plant.

In June of 2013 Utilities Kingston completed an Environmental Assessment Study for solutions to address the aging Cana WWTP. The study identified that a new sewage treatment system using Sequencing Batch Reactor (SBR) technology would be an ideal replacement for the existing Cana WWTP. The replacement SBR system has incorporated chemical and physical phosphorus removal and increased design capacity for the facility. The new sewage works has a rated capacity of 125 m^3/d, and a maximum day design flow of 200 m^3/d. The average flow through the plant was 60 m3/day in 2021.

2 PLANT OVERVIEW

The following is a process overview and description of the treatment steps taken at the Cana Wastewater Treatment Plant

Raw Sewage Pumping Station

A pre-cast concrete wet well accepts sewage flows from the existing sewer system for the Cana Subdivision. The wet well has two pumps which discharge into the preliminary treatment unit.

Preliminary Treatment Unit

Preliminary treatment involves the removal of large particles and floating debris such as wood, rags, and plastics from the raw sewage. This is accomplished with a manual bar screen installed inside a splitter box.

Secondary Treatment Unit

As the sewage flows through the splitter box and bar screen, it then discharges into the two Sequencing Batch Reactors. Each reactor is essentially an activated sludge process with aeration and settling taking place in the same tank. The decanted effluent from the SBR is then stabilized in a Post Equalization Tank. The sludge that settles out in the SBR is then pumped directly to the Digester.

Post Equalization Tank

The Post Equalization Tank collects the decanted water from the Sequencing Batch Reactors and discharges to the tertiary filter system.

Chemical Dosing Systems

Phosphorus removal is accomplished using Aluminum Sulfate, which is injected directly into the splitter box during pump cycles.

Tertiary Filtration Unit

The discharge of the post equalization tanks goes into a continuous backwash up-flow sand filter to polish the water before going through the ultraviolet disinfection system. filtrate then passes through one of the two UV disinfection units.

Ultraviolet (UV) Disinfection

The filtrate then passes through one of the two UV disinfection units. Each unit can handle the maximum flow of 200 m^3/day.

Outfall

The treated effluent from the plant is discharged into a 27.9-meter-long pipe into an existing creek which flows into Colonel By Lake.

Building and Control Room

There is one building that houses the tertiary filtration unit, chemical dosing systems, blowers, and all associated electrical equipment.

Digester Unit

The waste sludge generated from the SBRs is pumped into the digester for stabilization and storage. The digester supernatant is returned to the influent manhole and the sludge is hauled approximately every 30 days to Ravensview Wastewater Treatment Plant in the City of Kingston for further treatment.

Standby Equipment

A diesel generator on the property of the Cana Wastewater Treatment Plant provides backup electrical supply in case of power outages. This generator is directly connected to both the Cana Water and Cana Wastewater facilities and is capable of fully powering both systems in the event of a power outage.

Operating Problems

Staff continue to optimize the plant process to ensure continuous and reliable operations. A higher-than-expected concentration of raw wastewater made it difficult to manage phosphorus removal. This operational challenge led to a non-compliance for total phosphorus in the month of January. The Alum injection point was relocated, which resulted in effective phosphorus removal and a compliant effluent.

Sludge Generated

There were 16.5 loads, totaling 202 m^3 in volume, of sludge collected and brought to Ravensview Wastewater Treatment Plant. The sludge was discharged at the septage facility. We anticipate approximately the same quantity of sludge for 2022.

3 MAINTENANCE

Staff continue to use our preventative maintenance program in accordance with manufacture's recommendations. All of the Treatment facility flow meters are calibrated annually by third party contractors. Calibration records are available upon request.

Additional Maintenance completed this year:

- The Alum injection point was relocated to optimize phosphorus removal. A notice of modification was submitted to the MECP on April 26th, 2021.
- Diesel Generator control panel replacement

4 CAPITAL WORKS

- Diesel fuel tank upgrade

For further information about this report or any questions regarding accessibility contact James Patenaude with email at jpatenaude@utilitieskingston.com or call 613-546-1181 Ext 2525.