Space restrictions were a primary factor in the Ravensview Water Pollution Control Plant picking a BAF system, which upped the capacity by 30 percent.

Kingston chooses biological aerated filters for wastewater treatment plant upgrade

The Ravensview Water Pollution Control Plant (WPCP) currently provides primary level wastewater treatment from the City of Kingston, Ontario, including Pittsburgh Township and the Canadian Armed Forces Base in Kingston.

The existing process at Ravensview WPCP includes: mechanical screening for pre-treatment, primary treatment with chemical enhancement, sodium hypochlorite dosing for disinfection and sodium bisulphite dosing for dechlorination.The treated effluent is then discharged into the St. Lawrence River.

A study was completed in 2004 to determine the client's future needs and to ensure conformity with the provincial requirements (15 mg/L BOD5, 15 mg/L TSS, 0.08 mg/L TP and 5 mg/L ammonia). The results of the study indicated that an upgrade to a secondary level of treatment was necessary, as well as a capacity increase. With anticipated growth in the community taken into account, new plant design values of 95,000 cubic metres average daily flow and 193,000 cubic metres peak daily flow were taken into consideration.

One of the secondary treatment technologies considered by the design team was the BIOSTYR biological aerated filtration process available from John Meunier Inc. However, in order to confidently select a suitable technology for this application, a pilot study was performed at the Ravensview WPCP site. After evaluating the results of the pilot study, the client selected the BIOSTYR process as the best technology for this application.

Some of the advantages of the BIOSTYR process include its ability to provide a high level of treatment in a very compact footprint, as well as reduced operating and maintenance costs compared to conventional treatment technologies.

BAFs (biological aerated filters) are compact treatment processes, which combine filtration and aerobic/anoxic treatment using a fixed-film biological degradation process. The BIOSTYR BAF uses floating polystyrene media comprised of individual spherical beads as the support for biofilm growth.Wastewater is fed in an upflow manner through the BIOSTYR, resulting in biological abatement of the pollution as well as physical filtration of suspended solids. Space restrictions at the construction site necessitated a compact and efficient biological treatment technology.

A total of 11 BIOSTYR cells were implemented to remove dissolved contaminants and provide high-level treatment. This will be one of the largest biological aerated filter applications in North America for secondary treatment.

"With a budget of $115 million, upgrading the Ravensview plant is the largest capital project ever undertaken by the City of Kingston," noted Allen Lucas from Utilities Kingston.

Funding for the project was made available through the Canada Strategic Infrastructure Fund and also from the Province of Ontario. The prime objectives of the upgrade were:

• To conform to current provincial and federal environmental policies and requirements, achieving a measurable improvement of the effluent quality through the addition of secondary treatment with the BIOSTYR process.

• To increase the plant's capacity by approximately 30 percent to accommodate continued growth and development within the City of Kingston over the next 25 years.

"Ravensview will ensure superior treatment of Kingston's wastewater before discharge to Lake Ontario at the head of the St. Lawrence River, returning to the water its natural resource quality for the benefit of the environment and downstream communities," explained Jim Keech, president and CEO of Utilities Kingston.

The construction of the concrete cells, the aeration grids, the instrumentation and control were completed over the course of the summer of 2008. The biological process started last September. The seeding of the biological process was very rapid; carbonaceous pollution removal was established one week after start-up and nitrification three weeks after start-up.

Process performance tests commenced on February 17th, 2009, consisting of a three-day trial which successfully demonstrated the process design; further testing and verification of the process will continue over the next 12 months.

John Meunier Inc.
Reader Reply Card: 1137
Web link: baumpub.com/CEP1137