

VigorOx[®] WWT II Is the Most Cost Effective Disinfection Alternative for a Wastewater Plant in Sudbury (Canada) to Meet Regulatory Requirements

Plant Background

- Name of Plant: Valley East Wastewater Treatment Plant (Sudbury, Ontario, Canada)
- Type of Wastewater and Upstream Treatment Processes: Municipal wastewater with secondary treatment processes and an average flow rate of 2.0 million gallons per day.
- Current Disinfection Process: Gaseous Chlorine (without dechlorination)

Challenges

Improvement of disinfection process is required in order to meet new requirements in accordance to the Canadian Environmental Protection Act:

- Chlorine residual will be limited to 0.02 mg/L or less to minimize toxicity to aquatic organisms
- Disinfection goal will maintain as a monthly geometric mean of 200 CFU/100 mL for E. coli.

Proposed Solution

- The city hired an engineering firm to evaluate three disinfection options including chlorination followed by dechlorination, ultraviolet (UV) light irradiation and VigorOx[®] WWT II.
- VigorOx WWT II is included in the evaluation because of its unique nature of high disinfection efficiency, very low toxicity to aquatic organisms, capability of retrofitting into existing facilities, ease of operation, small footprint and low capital costs.
- Bench scale test and pilot test were conducted for VigorOx WWT II.

Results and Conclusions

- Pilot test confirmed that VigorOx WWT II is a cost effective solution for this plant to achieve the disinfection goals.
- Specifically, a VigorOx WWT II dosage of 0.7 to 2.0 ppm was found to be effective to disinfect E. coli to well below the permit limits.
- A lifecycle cost analysis indicated that VigorOx WWT II is the most cost effective option (Table 1).

Table 1: Cost Comparison of Disinfection Technologies

Alternatives	Capital Cost (\$1,000)	Annual O&M Cost (\$1,000)	Net Present Value (\$1,000)
VigorOx WWT II	1,200	60	2,200
Chlorination/Dechlorination	2,900	45	3,600
UV	3,100	80	4,200

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