HOW TWO MUNICIPAL WWTPs SAVED MONEY & ENERGY USING REAL-TIME INFLUENT MONITORING

In the pursuit of operational efficiency and sustainability, wastewater treatment facilities are increasingly turning to advanced technologies. This includes using technology in locations never possible before to gather data on critical areas that affect treatment performance, effluent outcomes, and energy use within the plant. Two municipal examples of this include the Sewer Authority Mid-Coastside (SAM) in California and the Charlottetown Pollution Control Plant (CPCP) in Eastern Canada who in both cases, turned to SENTRY™ Water Monitoring and Controls (SENTRY) for earlier, real-time wastewater insight using the company's robust biofilm-based sensors.

Better Wastewater Sampling for Better Effluent Outcomes

Half Moon Bay, California, is home to SAM which operates a 15 million gallons per day (MGD) wastewater treatment facility serving a population of 27,000. SAM faced challenges with high and variable Biochemical Oxygen Demand (BOD) levels in its influent, largely due to industrial discharge in the region. Traditional BOD testing methods were slow and unreliable, prompting the facility to rely on labor-intensive Chemical Oxygen Demand (COD) sampling. Manual COD sampling and analysis requires operator time and availability meaning that samples are taken daily from Monday to Friday, and not on the weekend. This sampling regime resulted in missed influent events and very limited ability to act on data indicating challenging influent.

To address these issues, SAM installed SENTRY wastewater sensors at strategic points in the treatment process, including the influent and primary clarifier effluent. These sensors uniquely provided real-time data on influent BOD, organic loading, and biomass health enabling immediate operational adjustments that weren't possible before with manual sampling. The benefits were substantial:

- **Cost Savings:** By reducing the need for manual COD sampling by 80%, SAM achieved an estimated annual savings of $50,000.
- **Operational Efficiency:** Real-time monitoring allowed the facility to promptly address incoming organic loads and toxic events, maintaining stable effluent quality.
- **Future Optimization:** SAM plans to expand its use of SENTRY sensors, including implementing a feed-forward aeration control system to further optimize energy use and effluent quality.

The real-time, early-on insights SAM gained proved critical in a region challenged by industrial dischargers. Now SAM is better positioned to manage the ongoing variability and do so with less time and money.

Decarbonizing Where it's Needed Most

Located in Charlottetown, Prince Edward Island, the CPCP has a design capacity of 7 MGD. The facility was identified as a major contributor to the community's greenhouse gas (GHG) emissions, accounting for almost one third according to the 2018 Community Inventory Greenhouse Gas Inventory. Seeking to mitigate its environmental impact, the CPCP turned to SENTRY and its partner, APG Neuros, to implement an intelligent Advanced Aeration Control (AAC) system since they knew aeration is one of the most energy intensive and expensive processes in municipal treatment facilities.

SENTRY wastewater sensors were placed upstream providing the only reliable minute-by-minute, feed-forward signal that can be used for aeration control. This allowed the AAC system to better monitor incoming organic loads which were confirmed for accuracy using machine learning-based algorithms and modelling before aeration adjustments were made regarding how much energy was needed to effectively treat the wastewater. This approach allowed for more precise aeration tuning and enhanced overall system performance. The results were significant:

Charlottetown Treatment Plant where they're using SENTRY wastewater sensors upstream to monitor incoming loading and make more accurate aeration adjustments for energy conservation

- **Energy Savings:** The facility validated a 14% improvement in aeration efficiency during test periods, translating to annual savings of $30,000 in electricity costs.
- **GHG Emissions Reduction:** The initiative would cut GHG emissions by 65 tons of CO_2 equivalent annually, comparable to the CO_2 removal capacity of 77 acres of forest.
- **Community Impact:** The energy savings are sufficient to power over 150 homes, demonstrating a tangible environmental benefit.

The Sewer Authority Mid-Coastside (SAM) treatment plant where they're using SENTRY wastewater sensors for real-time, early-on influent insight to better manage variable influent from industrial dischargers

The CPCP's success serves as a pioneering model for decarbonizing wastewater treatment, offering potential annual savings in the hundreds of thousands of dollars if adopted by larger cities across North America.

The Right Technology at the Right Location

The experiences of SAM and CPCP adopting SENTRY's unique wastewater sensors highlight the transformative potential of not only using advanced technology but also of using it in new locations within a WWTP. These cases prove that having the right data when it's needed most is powerful helping optimize treatment processes and reduce the environmental footprints of today's plants while saving tens of thousands of dollars annually in the process.

For More Information: Visit SENTRY at www.sentrywatertech.com.

The zero-calibration, biofilm-based SENTRY wastewater sensor

Author Contact Details

Patrick Kiely, CEO • SENTRY Water Monitoring & Controls

- Address: 65 Watts Avenue, Charlottetown, PE C1E 2B7, CANADA
- Tel: +1 (902) 200-8632 • Email: pkiely@sentrywatertech.com • **Web: www.sentrywatertech.com**