



Variable Influent. Predictable Outcomes.™

Identifying problematic industrial discharge sources & improving pretreatment programs



Location: Town of Cobourg, Ontario

Client: Town of Cobourg

Type of Plant: Wastewater Treatment Plant (WWTP)

Location of Sensors: In the headworks of the WWTP

Problem Statement: Variable influent wastewater quality resulting in poor treatment efficiency and compliance risks and the inability to determine the sources of problematic industrial discharges upstream

Outcome: Reduced excessive sampling for wastewater personnel, real-time sampling when an industrial discharge is identified, and more consistent treatment plant performance now knowing when upset events happen, where they stem from, and the exact compounds involved

"In the past being proactive regarding Industrial discharges was very labour intensive and time consuming but now with the real-time monitoring and detection by the SENTRY sensor combined with the sample-related data, we can easily and confidently continue to provide consistent treatment plant performance and upstream regulatory compliance."

Jennifer Leno,
Environmental Compliance Officer,
Town of Cobourg

Overview and Problem Statement:

Like many municipal utilities, the Town of Cobourg faces the ongoing challenge of variable influent wastewater quality resulting in poor treatment efficiency and compliance risks plus the inability to determine problematic industrial discharge sources upstream.

These challenges are part of a larger trend. Across North America, nearly 50% of the permitted wastewater treatment facilities have had a non-compliance event within the past year and upwards of 90% of these non-compliance events can be linked to variable wastewater quality as a direct result of industrial dischargers.

Deployment Experience – Variable Influent? Predictable Outcomes

To enhance visibility into these events, the Town of Cobourg installed a SENTRY™ System at the headworks of their treatment plant in August of 2022. This system provides real-time insights into wastewater quality, capable of flagging periods of high organic loading or biological inhibition – conditions that if not monitored, can compromise biological treatment processes.

Test Results and Values:

Early Results

Throughout the deployment, the SENTRY system flagged multiple events that indicated periods of undesirable influent wastewater quality as seen in Figure 1.

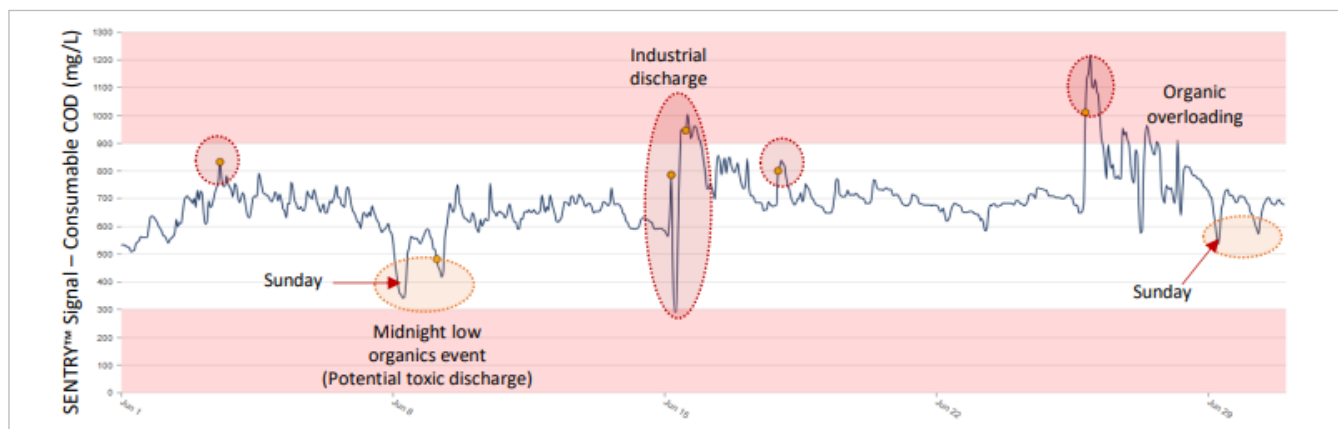


Figure 1: A sample look at real-time event monitoring in the Town of Cobourg's SENTRY web dashboard

These events not only correlated with stress on secondary treatment processes, but also with certain Compliance Monitoring Reports that detailed specific discharges from known industrial users within the sewershed. The ability to correlate SENTRY signal anomalies with external discharge data enabled Cobourg to connect treatment upsets with specific upstream activities - turning operational insight into regulatory evidence.

A Step Above: Incorporating Event-based Auto-sampling

Interestingly, not all flagged events matched known discharges. This highlighted a key challenge: not all problematic discharges were being captured by traditional monitoring methods.

To help close this gap, the SENTRY System was designed to easily integrate to existing or dedicated auto samplers enabling them to provide event-based grab samples during periods of time where the plant is experiencing undesirable wastewater conditions. These event-based samples allow operations teams to sample when it counts, instead of relying on traditional composite sampling and guess work - historically proven to miss out on detailing the who, what, and when events are taking place.

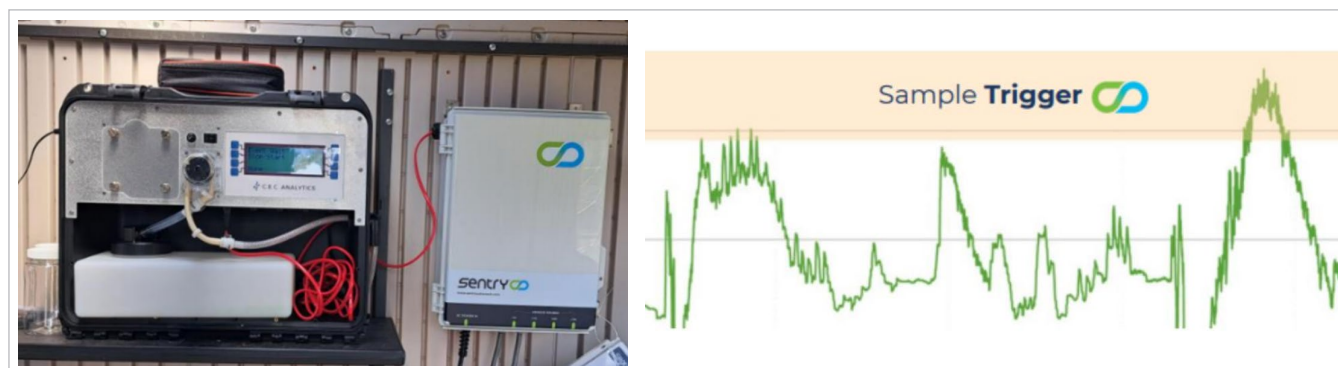


Figure 2: The SENTRY control panel (that interfaces with the real-time BOD SENTRY sensor in the plant headworks), the C.E.C. Innovations autosampler, and a sample SENTRY web dashboard view of real-time biological activity

Deep Dive: Identifying the Industrial Source

These event-based samples triggered by SENTRY's reliable real-time monitoring system were sent to our partner laboratories, operated by CEC Innovations (CEC), who perform a Non-Targeted Analysis (NTA) on the sample. Traditionally, these results are not operationally relevant due to the several thousand compounds detected but in our CEC's case, they apply proprietary analytical methods trained on a database that consists of tens of thousands of unique wastewater samples to define exactly which compounds were present and responsible for the upset events, and more importantly, what was the industrial source.

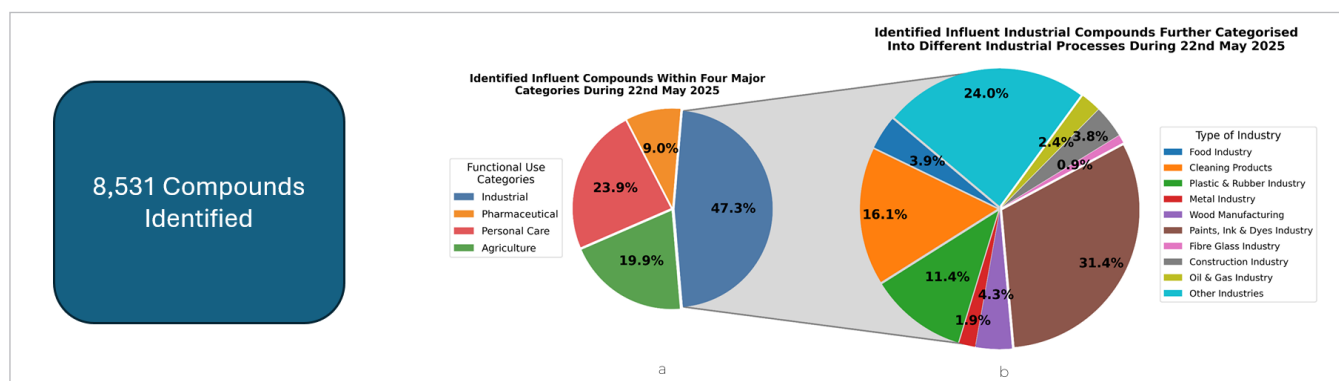


Figure 3: A look at CEC's compound analysis used at the Town of Cobourg

Final Outcome & Key Takeaways:

The Town of Cobourg's SENTRY/CEC implementation has resulted in a comprehensive, industry-first closed-loop approach to managing industrial discharges and protecting biological treatment systems including:

- ✓ Real-time event monitoring at the headworks
- ✓ Automated, event-based sampling for representative evidence
- ✓ Advanced compound identification and source tracking through NTA and analysis
- ✓ Operational and regulatory alignment through data-backed decision-making

Together, this holistic ecosystem empowers both utility operators and pretreatment staff to proactively manage influent variability and respond with confidence.

The Town of Cobourg's deployment of SENTRY has transformed how the facility monitors and responds to industrial discharges. What was once a reactive is now proactive supported by a **data-rich, evidence backed strategy for ensuring consistent treatment performance and long-term regulatory compliance.**

As other municipalities face similar challenges, this forward-thinking town stands as a model for how real-time monitoring and smart sampling can unlock the full potential of pretreatment programs and safeguard a community's critical water infrastructure.

Visit the SENTRY website to see how other facilities are using our sensors to optimize & decarbonize wastewater treatment for just a few dollars a day!

