

Continuous SAC₂₅₄ Determination of Organic Pollutants Is Key in Real-time Wastewater Treatment Process Control

Introduction

To manage the wastewater treatment process efficiently, accurate knowledge of the pollutant levels in the wastewater is vital. Continuous monitoring allows –

- Timely detection of wastewater treatment plant inflows containing high organic pollutant levels

- Real-time detection and control of shocks from internal process stages
- Reliable monitoring of the treatment plant effluent and discharge compliance

Monitoring industrial dischargers and treatment plant influent

Figure 1 shows a sudden rise in the incoming pollutants at the inlet of the wastewater treatment plant. Higher organic loads could occur from industrial dischargers –

- Pulp and paper
- Food and beverage
- Dairy
- Metal finishing

Monitoring pre-treated discharges and plant influent gives operators the chance to adjust treatment as needed to properly handle the slug load or, if needed, divert flow to retention basins for subsequent, planned treatment.

Monitoring for shocks from internal processes

The chlorine and sodium hydroxide shocks from odor control scrubber systems to the front of the plant can reduce the BOD to a level that deprives sufficient food supply for microorganisms involved in carbonaceous-BOD and nitrogenous-BOD removal.

Conversely, supernatant returns from digestion and thickening stages can cause organic shock loads during

low organic periods (Figure 2), resulting in high oxygen demand that upsets subsequent aerobic phases.

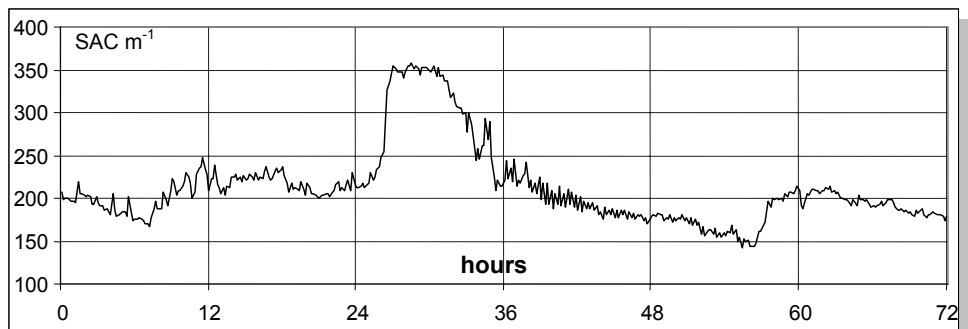


Figure 1 – Spectral Absorption Coefficient (SAC) in wastewater treatment plant influent

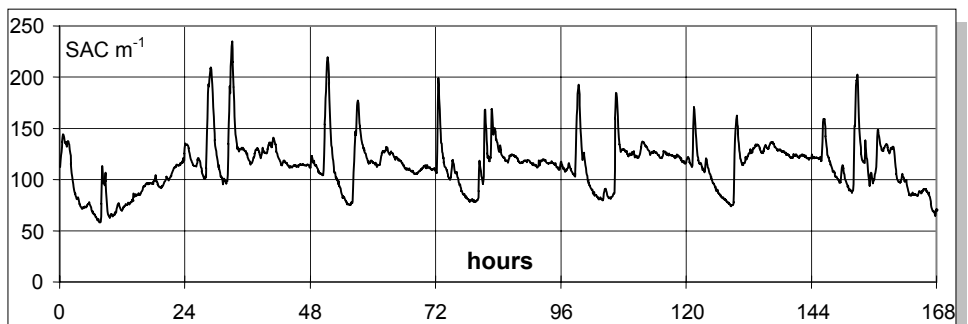


Figure 2 – Spectral Absorption Coefficient (SAC) detects organic shocks in supernatant discharges

Monitoring treatment plant effluent

Continuous measurement of SAC in effluent of the wastewater treatment plant provides economical confirmation and documentation of removal of carbonaceous-BOD (Figure 3).

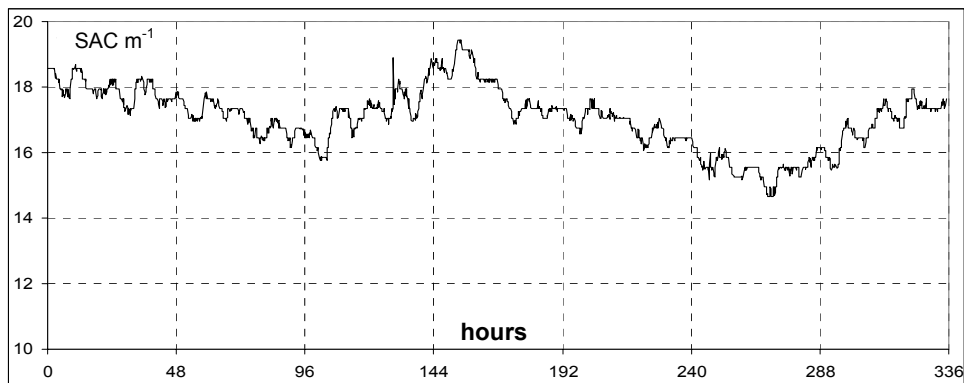


Figure 3 – SAC in wastewater treatment plant discharge



Product Application

The Hach UVAS® sc Sensor measures the dissolved organic material that absorbs UV light at a wavelength of 254 nm. This probe yields continuous, real-time monitoring of organic pollutants without manual sampling, conditioning, and reagents. A self-cleaning design further reduces demands on the operator.

With operator-selectable pathlengths, this versatile sensor provides the range of SAC measurement applicable from influent to discharge and all process points in between.

This application solution note is one of several Hach documents describing wastewater process control based on continuous SAC measurement. For more detail, refer to:

“Continuous SAC₂₅₄ Determination of Organic Pollutants Supports Management of Municipal Collection Systems,” Hach Application Solution AS-SAC1

“Continuous SAC₂₅₄ and TOC Measurement of Airport Runoff Streamlines Separation of Polluted and Unpolluted Water,” Hach Application Solution AS-SAC3

“Online SAC₂₅₄ Measurement Yields Operational Savings in the Paper Production Ozone System,” Hach Application Solution AS-SAC4

“SAC₂₅₄ Sensor Provides Reagent-free, Sampling-free Monitoring of Organic Materials in Drinking Water Treatment,” Hach Application Solution AS-SAC5

“SAC₂₅₄ as an Oxygen Demand Predictor: the Relationship and Correlation of Oxygen Demand Parameters and SAC,” Hach Application Solution AS-SAC6



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