

Effluent Monitoring Technology Improves Plant Production Efficiency

Problem

Cobevco (now part of Encirc Beverages), an industrial plant in the UK, needed tighter control of the treatment process at its wastewater treatment plant (WWTP).

Solution

Hach®'s BioTector TOC online analyser was installed to monitor the front end of the WWTP. Delivering results 20 times faster than previous laboratory techniques, it provides advance notice of organic overload so the plant can instantly divert carbon-rich waste and protect the treatment process.

Benefits

Operators on the production floor can now see in real-time how their actions affect the WWTP and this enables them to address issues. The link between information and action is very powerful and has resulted in strong operating advantage for Cobevco.

Initial Situation/Background

Cobevco's original plant investment plans incorporated a commitment to streamline operational throughput and minimise any impacts on the local environment. Central to the environmental programme is an in-house biological WWTP, operating 24/7 between 3 staggered Sequential Batch Reactors (SBR).

Flow rate of effluent water is measured to determine the treatment capacity needed and excess volume is diverted to an on-sitelagoon. Organic loading is also a measurement parameter of key importance.

Cobevco wastewater contains various organic components, mostly sugar based compounds. Waste stream loading can rapidly elevate and could damage the WWTP bacteria used to consume the organics.

Improvements

Management Response

Live data on the initial organic load is crucial so that process managers can intervene in situations of overload, divert the waste to a holding tank and reduce flow into the treatment process.

Continuous monitoring

Previously, samples were manually collected 3 times daily and BOD was analysed at the laboratory. As a 5 day test this can seriously affect the throughput of the treatment process, and is clearly impractical for active management and intervention. The BioTector gives management and operators immediate visibility and enables rapid response.

Information Integration & Dissemination

Data is currently downloaded directly to an SD card and exported to Excel for integration and trending against other key parameters including flow, pH and dissolved oxygen. Matt Tait, Site Facilities Manager, says: "The final stage of the process will be to integrate signals from the BioTector into the SCADA system for complete visible control. With SCADA and alarm parameter data available to individual line operatives, they will have full visibility of the effect their activities have on the treatment plant."

Correlation

Cobevco found very consistent trending between TOC, BOD and COD levels of the effluent and use the appropriate correlation factors for the BioTector analysis. Now all 3 parameters are reported on-screen and saved to the data log.



Benefits

Reflecting on the advantages, Matt Tait said: "The BioTector acts as a policeman on the treatment plant, helping us to improve plant efficiency by enabling us to manage the forward feed organic and hydraulic loading to each SBR.

We have found the BioTector to be very user-friendly; reagent levels are displayed and the instrument has not needed any recalibration or replacement parts between its 6 monthly services."



Solution

Taking approximately 7 minutes from sample to result (without any sample pre-treatment or dilution) and with the option of measuring up to 6 independent sample streams on a single instrument, the Hach BioTector offers significant throughput potential.

Wide-bore tubing with an integrated acidic back-clean in the presence of micro-bubbles prevents lines from clogging or cross contamination between samples, ensuring drift-free operation without any recalibration between 6 monthly services.

By linking the BioTector to a flow meter through an internal relay in advance of the feed, Cobevco only samples when there is flow to the treatment plant. This reduces reagent consumption and lowers costs.

Conclusion

Historically, the ability to measure organic load continuously at Cobevco was not possible because instruments could not cope with the strength of the effluent without filtration. The BioTector TSAO technology completely resolves this problem and opens the door to new levels of process control.