Ceramic filter improves reliability of ammonia measurement

Jersey Water cuts operating expenditure and lab time

With a history dating back to 1882, The Jersey New Waterworks Company Limited (trading as 'Jersey Water' since 2004) is the oldest established company on the island of Jersey. One small well in the parish of St. Lawrence, in the south of the island, was the source of the first mains water ever made available to islanders. Now Jersey Water operates from 20 sites across the island and supplies treated mains water to over 90% of the population. The company constantly strives to meet the challenges of a rapidly expanding island population with limited natural water reserves – nearly all of the island's water supply is derived from rainfall.

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Electrical Engineer and Assistant Asset Manager
Jersey Water

Ian Young

Handois Reservoir

The challenge All of the water supplied by Jersey Water is treated at one of two water treatment works located at Handois and Augrès. The treatment works at Handois are supplied directly from the adjacent Handois Storage Reservoir, which acts as a collecting point for water pumped directly from other reservoirs and raw water sources. Both treatment works use a two-stage method of water treatment comprising chemically assisted sedimentation and rapid gravity filtration followed by disinfection using chlorine and ammonia (chloramination) and UV.

In February 2014, Jersey Water purchased two Stamolys CA71 chemical photometric analysers from Endress+Hauser to measure the levels of ammonia in the raw water and post filtration. This measurement not only checks if the raw water in the reservoir has been contaminated as a result of agriculture or pesticides but also determines the correct dosage of ammonia for the chloramination process. In order to comply with regulations governing the supply of drinking water, the company needs to detect extremely low concentrations of ammonia – less than 50 parts per billion (ppb). "We decided on the Stamolys CA71 because it's the only instrument on the market that has that lower-end range," confirms Ian Young, Electrical Engineer and Assistant Asset Manager at Jersey Water.

The analysers were connected to the water company's own sample filtration system consisting of a cloth filter in a plastic housing. But the filters regularly became clogged with organic matter and had to be replaced at a cost of €30 each. More crucially, the readings from the analyser were inconsistent with the results produced from samples tested in Jersey Water's laboratory.

The solution Analytical experts from Endress+Hauser were called in to assess the problem. The CA71 analysers were sent back to the production centre in Germany for testing and it was determined they were working perfectly. More tests were carried out on the process and it was discovered that algae growth in

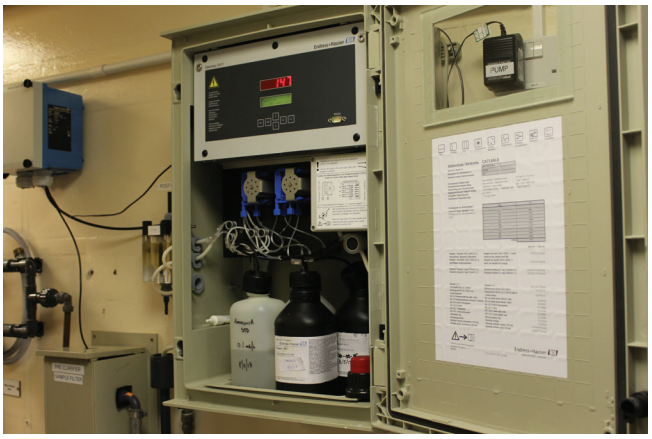
the filtration system was to blame: the algae were consuming some of the ammonia before it could be detected by the analysers.

The solution was to replace the cloth filtration system with a new sample preparation system from Endress+Hauser, Liquiline System CAT820. The CAT820 has a ceramic filter that filters samples to 0.1 micron, small enough to allow the dissolved ammonia through but keep other particulates out of the prepared sample. The ceramic filter was fitted inside a custom-built flowcell to make it compatible with the CA71, as the ceramic filter is usually suspended in open tanks to filter samples for analysis by the new Liquiline CA80 colorimetric analysers.

The team at Jersey Water were impressed with the way the problem was resolved. "It was sorted out quickly and our contact at Endress+Hauser was really helpful," explains Ian Young. "The new filter is a really good piece of kit – the results are now a lot more reliable and a lot more consistent down the lower-end range." The Liquiline System CAT820 and its ceramic filter unit have been specifically designed for preparing samples for colorimetric measurements in the water and wastewater industries, where sample preparation is absolutely critical to ensure accurate and repeatable measurements for dissolved ammonia and phosphate in particular, as these are regulated measured parameters in both industries.

The ceramic filter

The benefits As well as improving reliability, the solution has cut operating expenditure and reduced maintenance effort. "The operating costs have been done away with," says Ian Young. "Before we had to constantly clean and maintain the cloth filter so it's saved time and effort and has cut down on instrument downtime. The new system's not maintenance-free but it's certainly low maintenance." By far the biggest benefit is being able to rely on the measurement. As Ian Young says, "We're getting consistent and accurate results and that's the most important thing."



Stamolys CA71 ammonia analyser

Clarifiers at Handois water treatment works

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