County of Santa Cruz effectively controls H_2S in its wastewater treatment plant

Waste water monitoring

s::can's spectro::lyser monitors and controls the dosing of chemicals to reduce H_2S, improving the efficiency of the dosing, diminishing the odor problem, protecting the environment and lowering the operational costs.

County of Santa Cruz (USA)

Parameters monitored:

- NO_3
- Dissolved H_2S
- pH

Facts & Figures

Company/Institution:
County of Santa Cruz

Location:
California (USA)

Application:
Waste water

s::can Partner:
s::can USA

Key Products installed:
spectro::lyser

Background

County of Santa Cruz discharges raw sewage to its wastewater treatment plant (WWTP). Some of the mains have long residence times and suffer from elevated dissolved H_2S concentrations, especially in the summer when temperatures are high and odor-producing bacteria are more active.

At low concentrations H_2S causes a noxious odor, and at higher concentrations, H_2S can be lethal. In addition H_2S causes concrete corrosion, which can impact the structural stability of the sewer mains, resulting in potential harm to the environment.

The Santa Cruz WWTP is located in a highly populated area and odor complaints are common when sulfide concentrations peak. To combat this problem, the county doses a nitrate-based odor control chemical upstream of the WWTP. While the odor control chemicals are effective at reducing dissolved sulfide concentrations, the amount of chemical to dose is difficult to optimize due to the rapidly fluctuating concentration of dissolved sulfide. This results in wasted chemical during over-dosing, and potential odor complaints during under-dosing.

s::can's solution

In order to more accurately measure and control dissolved sulfide concentrations in real-time, Santa Cruz County installed the s::can spectro::lyser™ downstream of its chemical dosing facility.

One of the big advantages of the spectro::lyser™ is that it can measure many important wastewater parameters simultaneously including: nitrate, nitrite, COD, BOD, TSS, and dissolved H_2S.

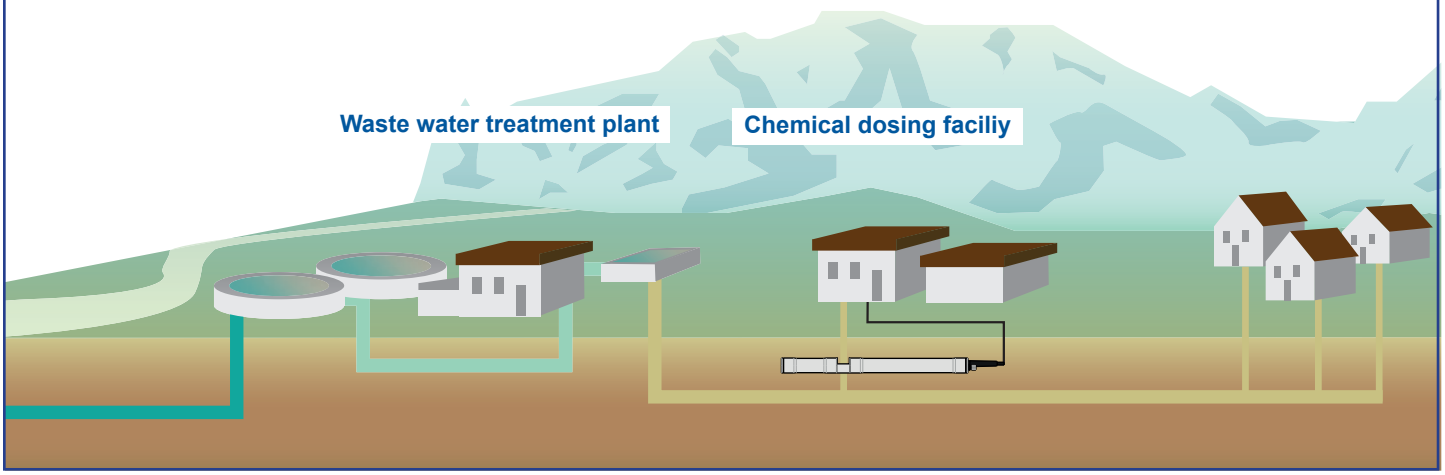
In order to accurately dose the nitrate-based odor control chemical in Santa Cruz, key parameters were measured:

- Dissolved H_2S
- Nitrate concentration

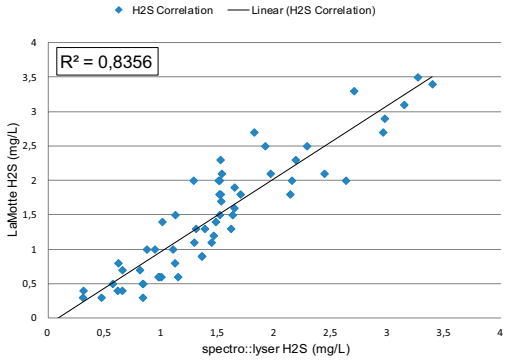
By simultaneously measuring these two parameters, the county of Santa Cruz is not only able to monitor the concentration of hydrogen sulfide, but also monitor whether it is overdosing its nitrate-based control chemical. The installation results in better control of H2S and cost savings.

> **"s::can's solution gives us a tool to efficiently dose odor control chemicals, reducing risks and lowering our costs."**
>
> Scott St. Denis
> (TPO Supervisor, County of Santa Cruz)

Process Schematic

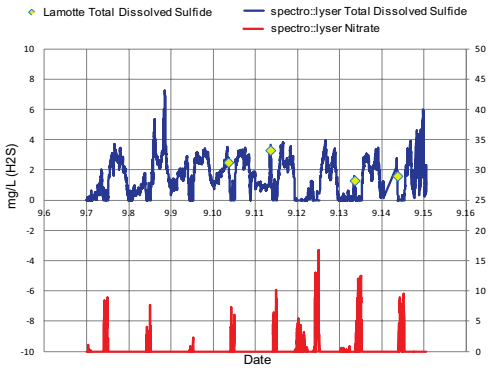


Santa Cruz WWTP Influent H_2S Correlation



Measurements of dissolved sulfide of the spectro::lyser and the LaMotte reference shows good correlation between methods. The spectro::lyser proved to be more reliable in the lower measuring range

Total Dissolved Sulfide and Nitrate 9/7 - 9/22/2012



Rapid fluctuation of dissolved sulfide (blue graph) and over dosing of nitrate-based odor control chemical during low concentrations of H_2S (red graph)

The s::can spectro::lyser™ is a fully submersible UV/Vis spectrophotometer which measures light absorbance between 220 – 720 nm. s::can's specialized proprietary algorithms analyze and decompose the spectral data to provide measurements for many important wastewater parameters including: nitrate, nitrite, COD, BOD, TSS, and dissolved H_2S. There are no moving parts in contact with the water and no reagents are used.

s::can's con::cube is a compact, powerful and versatile terminal for data acquisition and station control. Integrating the newest processor technology, con::cube's very flexible options for interfacing to SCADA or any central database systems makes it perfect for station control. Its low power consumption fits the requirements for the operation in remote installations powered by solar panels.

By monitoring H_2S in Santa Cruz s::can helps to protect the health and safety of the population and lower environmental risks.
s::can is the world technology leader for submersible online spectrometer probes, water protection systems and event detection software. More than 7500 s::can monitoring systems are in use worldwide for drinking-, environmental-, waste-, and industrial water applications.

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