



CASE STUDY: Odor/Corrosion Control

- Raymore, MO -

Odor and Corrosion Control through Super-Oxygenation

COLLECTION SYSTEMS

HEADWORKS

PRIMARY CLARIFIERS

POST-AERATION

INDUSTRIAL

ECO OXYGEN TECHNOLOGIES, LLC

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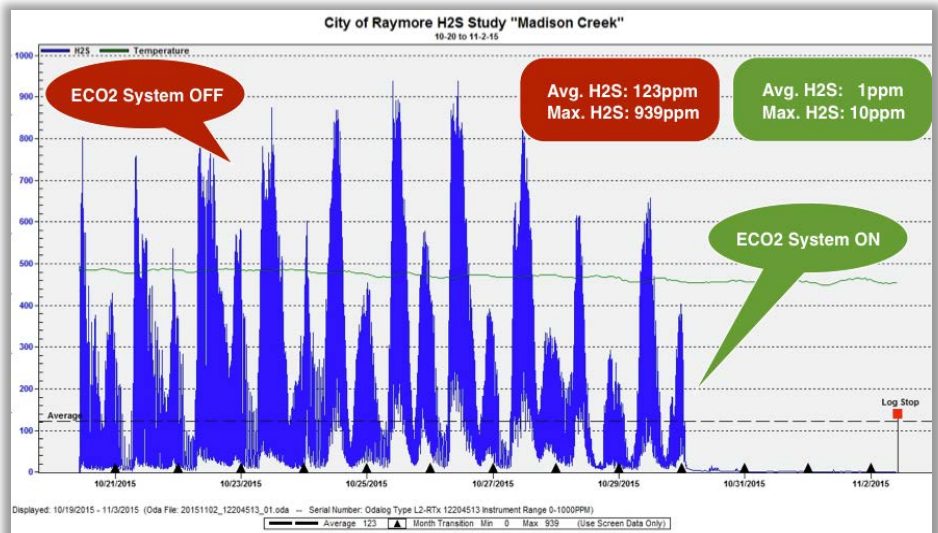
City of Raymore Combats Extreme Hydrogen Sulfide with Oxygen

As with many other cities around the country, the City of Raymore designed their force mains for future growth. The Owen Good Pump Station has a capacity of over 7 MGD, but pumps less than 1 MGD, resulting in less than optimum velocity in the force main and hydraulic retention times of up to 17 hours. Sewage goes septic after approximately 1 hour in a force main, at which point the sulfide formation begins.



The graph below shows the hydrogen sulfide (H₂S) concentration measured continuously over 12 days, at the discharge of the 3-mile-long, 24" force main (daily spikes of 600-900 ppm). The City realized that these H₂S concentrations go beyond the odor complaints and the accelerated corrosion they have been experiencing. The data indicates that at times the City staff maybe exposed to a severe health risk when working on their gravity system.

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OdaLog H₂S Data Trend – H₂S Concentrations (ppm)



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ECO₂ System Selection

HDR was selected to prepare an odor evaluation for the City of Raymore. They compared multiple control methods, including traditional chemical feed alternatives (calcium nitrate, ferrous chloride, hydrogen peroxide, potassium permanganate and sodium hypochlorite) as well as 3 oxygen injection systems.

Oxygen addition is less expensive than any of the traditional chemicals. Operating the ECO₂ equipment is also less expensive than any other pressurized side stream oxygenation system, due to lower pump horsepower and lower maintenance requirements.

While direct oxygen addition with a sparger would be less capital intensive, the risk for rags and debris getting caught is significant. Furthermore, non-dissolved oxygen will build up to form a headspace in the pipe, which will affect the pump operation.

The City chose ECO₂ SuperOxygenation equipment not only for the lowest operating and capital cost, but also for the most reliable system with the highest proven oxygen transfer efficiency.



Installation of ECO₂ SuperOxygenation System at the Owen Good Pump Station, Raymore, MO

Results

Results from the system start-up can be seen on page 1 of this document. As soon as the ECO₂ system is turned on and maintaining aerobic conditions in the force main, H₂S concentrations at the discharge drop to near 0 ppm.