Field study and model simulations of sulfur and nitrogen transformations in a rising main receiving nitrate dosing

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ABSTRACT

This paper contains a thorough investigation of the nitrogen, carbon and sulfur transformations occurring in a real sewer rising main receiving nitrate dosing. Nitrate consumption rates of 0.2-14 mg NO_3^--N/L/h were observed. The nitrate consumption rate was found to increase with increasing nitrate dose in the pumping station. At the outlet of the rising main, nitrite concentrations of up to 15 mgNO_2^--N/L were measured. A mathematical model describing the anoxic transformations in the rising main was set up and validated using the data collected during the field studies.

KEYWORDS

hydrogen sulfide, sewer, biogenic sulfuric acid corrosion, nitrate dosing