H₂S
CORROSION

Hydrogen Sulfide Corrosion Subject of EPA Report

By: Craig Fisher, P.E.
Association Engineer

While hydrogen sulfide corrosion is not a concern for PVC pipe, it is a significant problem in wastewater systems. A report published by the U.S. Environmental Protection Agency is an excellent primer on the topic. The report is entitled "Detection, Control and Correction of Hydrogen Sulfide Corrosion in Existing Wastewater Systems" and provides 157 pages of comprehensive coverage.

OVERVIEW

The following bulleted list gives an overview of the major sections of the document.

• Hydrogen Sulfide Corrosion. The document begins by describing the hydrogen sulfide generation process and discussing the factors that increase or decrease hydrogen sulfide corrosion rates.

• Target Areas. The components in the wastewater system that are most likely to be attacked are identified. Separate discussions are provided for gravity sewers, pump stations and force mains, and wastewater treatment facilities.

• Detection and Measurement. A plan of action for identifying the extent and severity of hydrogen sulfide corrosion is presented.

• Collection System. Chemical treatment options (and the associated costs) that reduce the rate of hydrogen sulfide corrosion are outlined. For corroded sewers, repair and rehabilitation techniques are reviewed.

• Pump Stations and Treatment Facilities. The methods that have been found effective for controlling hydrogen sulfide corrosion at those structures are discussed.

• Case Studies. Throughout the report, the application of these techniques by utilities are presented in a case study format.

HIGHLIGHTS

One point that the report drives home is that hydrogen sulfide corrosion is not an insignificant nor an isolated problem in wastewater systems.

"Hydrogen sulfide corrosion is a well-known and documented problem in wastewater collection and treatment systems throughout the world. The presence of hydrogen sulfide can lead to rapid and extensive damage to concrete and metal sewer pipes and tanks, mechanical equipment used in the transport and treatment of wastewater and electrical control and instrumentation systems. Unfortunately, such problems are rarely brought to the attention of the municipality until a catastrophic failure occurs such as a street collapse."

Another interesting aspect of the report is its practical side. A number of inspection aids that are simple to construct and are great time-savers are shown. Also, samples of checklists and data collection sheets are presented to help in the development of an inspection program.

The importance of corrosion resistance in the design and planning phases of construction is stressed throughout the report.

"Materials often found in wastewater treatment facilities and pump stations that are prone to hydrogen sulfide corrosion include cast iron, ductile iron, steel, copper, asbestos cement and concrete. Section 6.2 discussed the protective coatings and liners available to extend the useful life of materials subject to corrosion. However, many of these components will eventually fail or otherwise require rehabilitation or total replacement. When replacement does occur, the use of corrosion-resistant materials should be strongly considered. The use of such materials will likely increase the beneficial life of these components substantially."

The report is quite complimentary of plastics in general and PVC pipe in particular. The case studies are awash in examples where PVC pipe was the solution to a municipality's corrosion problems in sewers, electrical conduits, and air ducts. However, plastic solutions were not limited to pipe. PVC was used in liners for headworks tanks and channels, plastic chains replaced steel chains, fiberglass sludge rake boards replaced wooden rakes, and PVC bar screen sheets replaced metal sheets.

ORDER INFORMATION

To obtain your copy of "Detection, Control, and Correction of Hydrogen Sulfide Corrosion in Existing Wastewater Systems," write to the following EPA office:

US Environmental Protection Agency
EPA Publications Clearinghouse
P.O. Box 42419
Cincinnati, OH 45242
or call or fax the National Center for Environmental Publications and Information (NCEPI) at:

Phone (513) 490-8190
or Phone (800) 490-9198
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Ask for document number 832892001. Best of all, the report is free!