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Chemical Cleaning Process for Porable Water Distrubution Pipe Systems

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CHEMICAL CLEANING PROCESS FOR POTABLE WATER DISTRIBUTION PIPE SYSTEMS

THE NEED

Aging potable water distribution pipe systems are becoming a major concern throughout the world. Deterioration of water quality and service as a result of micro biological tuberculation and corrosion continues to increase. Major costs for replacement or rehabilitation of distribution systems are being faced by most communities. Over the years, microbiological activity has caused the pipes to scale with iron oxide deposits that reduce the pipe diameter causing chronic red water discoloration, taste and odor, turbidity and reduced pressure and flow. Replacing the old lines with plastic pipe would imply high costs and disruption to the residents by time-consuming excavation and supplementary water lines. In the past, tuberculation often required the replacement of the distribution pipe. There are mechanical cleaning devices, such as scrapers or pigs, which have been employed with various degrees of success, but all require extensive excavation and temporary service line installation due to the length of time required to do the rehabilitation work.

THE TECHNOLOGY

The chemical cleaning solution is an organic oxide scavenger which is mixed with a predetermined quantity of muriatic acid and circulated through an isolated section of the water main. The following steps are required for the field project sequence of the process:

- Isolation of the section of pipe to be cleaned.
 - Displacement of the water in the section with the chemical cleaning solution followed by circulation of the cleaning solution for a period of time (usually less than 12 hours) to clean the tuberculation from the pipe.
 - Displacement of the spent cleaning solution with system water from the cleaned pipe section back into the mixing tank.
 - High pressure flushing of the cleaned and serviced lines with system water.
- Disposal of the spent treating solution.

THE BENEFITS



Instead of taking months to dig up and replace restricted lines, a systematic chemical cleaning process is used to restore old lines to optimum flow at a fraction of the cost of replacing them.

The chemical cleaning solution process is usually less than 30% of the cost of pipe replacement and the section of pipe can be cleaned in 6-12 hours. It also has a minimum impact on residents, minimal traffic disruption and no road replacement or relocation. The process also dramatically lowers the coefficient of friction, resulting in lower pumping costs. Increased flow rates restore hydrant flows to near original conditions improving fire-fighting capabilities, thus reducing insurance premiums.

STATUS

The technology is commercially available and it has been successfully used. Over the past two years (1993-1994) the Village of Waterville, OH, in conjunction with Health Environmental Research Chemistry (H.E.R.C.) completed the first two phases of a project to clean a 6" water main utilizing a chemical solution. Although this technology is brand new, the procedure and the chemical cleaning solution composition has been analyzed and certified for use in the treatment of public drinking water systems by the NSF International (National Sanitation Foundation) under ANSI/NSF Standard 60.

BARRIERS

Market lack of knowledge and doubt of the potential benefits that the new chemical agents have as opposed to the traditional or more conventional methods. This will require customer education to build confidence and understanding of the technology, hence fomenting its use.

POINT OF CONTACT

Ludwing, J.; Edstrand, C. and Hieatt, A.

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REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

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