



NRC-CNRC

Institute for
Research in
Construction

Bringing quality
to the
built environment

Effect of Aging Water Mains on Water Quality in Distribution Systems

Objectives

To study and quantify the impact of aging pipes on water quality, and to provide utility managers with a decision-support tool to help prioritize the renewal of water mains.

Background

A holistic decision-support tool for managing the rehabilitation and renewal of water mains would require the simultaneous consideration of their structural integrity, hydraulic capacity, and role in the deterioration of water quality. However previous research efforts have focused largely on the first two issues, and have ignored concerns about water quality.

Statement of Work

- Identify from the literature the multiple sources, pathways and causes of water quality failure in the distribution network.
- Develop a process to model the deteriorated and restored state of the inner surfaces of the pipe as it affects the water quality in it.
- Build a framework based on fuzzy cognitive maps to integrate qualitative expert opinions and field data.
- Develop a process to continually update this framework with new data.
- Prototype a computer program for the proposed framework that implements all the procedures listed above into a decision-support tool.

Expected Outcomes

This research will provide utilities with a decision-support tool to help prioritize the renewal of water mains based on the deterioration potential of water quality.

Partners

American Water Works Association Research Foundation (AwwaRF)

Start/Expected Completion Dates

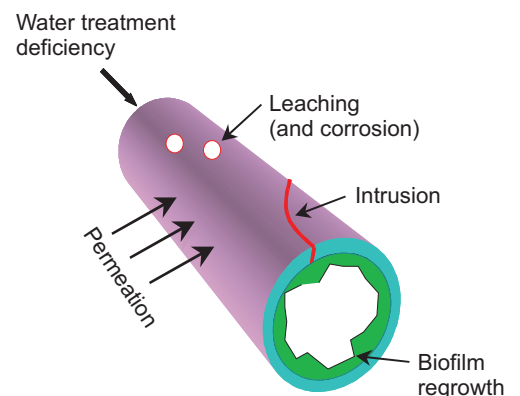
This project began in September 2003 and will be completed in September 2007.

Project Manager

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For more information, see http://irc.nrc-cnrc.gc.ca/ui/bu/agingwater_e.html

Factsheet 1, February 2005



Water quality deterioration pathways



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