Risk Management Considerations for Public Watermain Supply & Wastewater Infrastructure

In 2000, the town of Walkerton, Ontario's water system became infiltrated with E-coli in its iron pipes. Those pipes had a condition called tuberculation which is a form of internal corrosion that is a breeding ground for bacteria. Walkerton, now part of Brockton, Ontario, has replaced its pipes with PVC. PVC is not affected by tuberculation even after decades of use.

The National Research Council of Canada reports that the average break rate for ductile iron pipe is 15.87 per 100 miles of pipe. PVC's break rate is 1.17 per 100 miles of pipe.

Mitigation

Both the water supply lines and waste water lines are underground. They may be out of sight but should not be ignored. Budgets and financial pressures often mean that entities only respond to breaks, but this is not a long- term, sustainable approach. A proactive management plan is required that treats the infrastructure like an asset.

The management plan should consist of:

- An operation and maintenance of system pumps and valves for both water and waste water lines.
- A pipe cleaning program for water lines.
- Scheduled water line flushing and pressure and volume checks of fire hydrants.
- Leakage testing, both internal and external technologies can be applied.
- Checking for cross connections.
- Inspection testing and maintenance as outlined in NFPA 25 which details tasks and frequency.
- Adopting the AWWA (American Water Works Association) standard C651-14 that provides a procedure for disinfection of new mains, connection to existing mains and repair of mains.
- Sampling water quality at various checkpoints along the distribution network.

The strategic long term plan should consist of:

- An inventory of the infrastructure including age and condition assessment and remaining service life. Consider a GIS (Geographic Information System).
- Defining areas of the municipality most at risk e.g. houses built up to 1989 may have lead in their fixtures or solder.
- Budget considerations for replacement lines.
- Computer modeling of the network to define future demands.
- In pipe camera investigations.
  - Include upgrades or replacement based on the changing regulations and technologies.
  - Breaking down the task into manageable phases eg. preliminary and detailed assessments based on defined parameters.

The unexpected will always happen but in order to reduce the number of events a management plan that is thorough and adhered to will mitigate costs and tragedies.

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