

Best Management Practices for Water Main Repairs

Repair Scenarios:

1. Repair while maintaining positive pressure – *best*
2. Repair without pressure after shutting off customer services – *less desirable*
3. Repair without pressure without shutting off customer services – *least desirable*

1) Repair while maintaining positive pressure - *best*

Leaks or breaks are repaired with clamping devices while the water main(s) remain under positive pressure. This practice presents a low potential for contamination.

2) Repair without pressure after shutting off customer services – *less desirable*

When depressurizing a water main (zero or negative pressure), it is susceptible to contamination from site debris and back-siphonage. The following steps describe how to minimize the likelihood of contamination and potential consequences to public health.

Preparation for Repair:

- a) Notify affected customers of the planned service interruption.
- b) Notify office staff to facilitate customer calls (provide a map if possible).
- c) Shut off customers at meter / curb stop.
- d) Isolate the mainline by shutting off mainline valve(s).
- e) Excavate below the damaged mainline and dewater trench to below pipe level.

When repairing the water main with a repair band:

- a) Treat the exterior of the exposed pipe, repair materials, and tools to facilitate repair with a minimum of a 1-percent chlorine solution.
[To create a 1-percent chlorine solution, add approximately one volume of unscented household bleach per 5 volumes of water.]
- b) Account for and control residual chlorine in water discharged to a stormwater system.
- c) Install the repair band with disinfected parts.

When replacing a broken section of pipe with a new pipe section:

- a) Remove the damaged pipe section and allow the remaining water to drain. Be sure to maintain a water level in the ditch below the pipe at all times.
- b) Treat the exterior of the exposed pipe, the interior of the new pipe to be added, repair materials, and tools to facilitate repair with a minimum of a 1-percent chlorine solution (see above).
- c) Complete the cut-in procedure with disinfected parts.

Post Repair Process:

- a) Open the isolation valves, and thoroughly flush the repaired line segment through a fire hydrant or blow off. Flush in a direction to best clear the main of any debris or sediment until the air is eliminated and water flows clear.
- b) For water systems that maintain a chlorine residual, check the chlorine residual at a point downstream of the repair site. Residual should be comparable with the surrounding area.
- c) Collect a coliform bacteria sample downstream of repair site, or on each side of repair site if flow direction is not known, to ensure repair procedure effectiveness. Mark as a "special sample" and retain in utility records for two years.
- d) Open customer services and flush water through outdoor hose bib(s) to remove air and turbid water. Efforts to contact the customer before flushing water through their hose bib is recommended. Leave instructions for the customer to flush household taps.
- e) If the post-repair coliform sample result shows the presence of coliform, collect another special sample in affected area. If sample result continues to show presence of coliform, contact your local drinking water regulator to consult on corrective action.

3) Repair without pressure without shutting off customer services - *least desirable*

Under some conditions, damaged water mains become depressurized due to the nature of the damage. Under these circumstances, the water main is far more susceptible to contamination therefore additional measures to protect public health are necessary:

- a) Advise affected customers to take personal protective action by boiling water prior to consumption or using bottled water. Notify media if the affected area is extensive.
- b) Notify drinking water regulator or state drinking water program of situation and review protocols as necessary.
- c) Conduct the repair and/or pipe replacement.
- d) Excavate below the damaged mainline and dewater trench to below pipe level.
- e) Disinfect new pipe/fittings to be placed in service and connect into the distribution system. Flush to restore system chlorine residual if applicable, and verify system pressure.
- f) Flush customer services through outdoor hose bib(s) to remove air and turbid water. Efforts to contact the customer before flushing water through their hose bib is recommended. If no outside bib is accessible, leave instructions for the customer on flushing.
- g) Collect a coliform bacteria sample downstream of repair site or on each side of repair site if flow direction is not known to provide a record of repair procedure effectiveness. Mark as a "special sample" and retain in utility records for two years.
- h) If the post-repair coliform sample result shows the presence of coliform, collect another special sample in affected area. If sample result continues to show presence of coliform, contact your local drinking water regulator to consult on corrective action.
- i) Notify your drinking water regulator or state drinking water program of absent sample results and that advisory will be lifted. Notify media if the affected area is extensive.
- j) Notify customers advisory is lifted and to flush all household taps for at least 2 minutes.

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