

Connecticut Department of Public Health Drinking Water Section

Recommended Sanitary Procedures when Making Unscheduled and Emergency Repairs of Water Mains

If an interruption in public water service resulting in a water outage to any consumer occurs, the public water supply should notify the Department of Public Health and all applicable local health departments by calling the Departments and then submitting the notification form that can be accessible at www.ct.gov/dph/publicdrinkingwater as soon as possible. The notification to Health Officials is necessary to assess & determine the likelihood, if any, of an imminent and substantial danger to public health. Every effort to re-establish service with the shortest possible delay consistent with the safety of the consumers and the general public should be made. Discretion in the application of these recommendations is allowable except as required by regulation.

Whenever an unplanned interruption in water service occurs (i.e., source failures, power outages, main breaks, etc.), a set of circumstances is created that poses a threat to water quality. Atmospheric and negative pressures created in the distribution system can permit ground and surface water to enter the system via joints, cracks, and holes in the piping network and set the stage for cross connections to contaminate the system. Despite a public water supply's best efforts to ensure a tight distribution network free of cross connections, no system can be totally immune from the threat of a water quality problem in the event of water service interruption. Every effort to avoid outages should be implemented as the best safeguard against this threat. However, should an unplanned outage occur, the following procedures are recommended:

PUBLIC NOTIFICATION:

- Notify affected customers about schedule, procedures, concerns, and when necessary advise the affected public of drinking water locations that can be accessed and used during the water outage.
- Suggest customers flush their home plumbing after repairs are completed, and instruct customers of ***systems that do not routinely chlorinate the water*** to boil available tap water prior to consumption until further notice.

EXCAVATION AND TRENCH WORK:

- Install temporary diversion devices to control surface water runoff into trench.
- Apply liberal amounts of hypochlorite (tablets preferable) to the flooded open trench especially if sewers are present nearby.
- Provide for dewatering of excavation to below the level of pipe invert.
- Flush the water main while the standing water is being pumped out of the trench.
- Keep pipe, fittings, and valves away from excavated soil or backfill materials.
- Clean interior of pipe materials which contact soil or backfill.
- Maintain flow or positive pressure to prevent backflow into pipe.

REPAIR ACTIVITIES:

- Maintain protective coverings on equipment until ready for installation.
- Clean visible debris from exposed existing pipes.
- Protect existing mains and service connections with caps or covers.
- Ensure that all cables, pipes, and hoses drawn through mains are clean.
- Swab or spray the interior of all pipe, fittings, and repair clamps used in making the repair with a minimum 1% hypochlorite solution before they are installed.
- Swab or spray the interior joint surfaces with a minimum 1% hypochlorite solution just prior to making connections (unless in sub-freezing conditions).
- Minimize soil contamination of working equipment.
- Disinfect hand tools, saws, and tapping machines used for installing pipe and fittings. Use chlorine dips and rinses (unless in sub-freezing conditions).
- Conduct hydrostatic test on repaired water main to ensure integrity of repair.

DISINFECTION METHODS AFTER REPAIR IS COMPLETED:

- Leaks or breaks that are repaired using repair clamps on fully pressurized water mains (>25 psi) do not need to be further disinfected following the swabbing or spraying of the repair area and the interior of the repair clamp with a minimum 1% hypochlorite solution. However, if at any time the water main is shut down and depressurized, a more thorough disinfection procedure should be conducted as follows.
- Thoroughly flush the water main (minimum velocity of 2.5 fps) immediately after the repair is completed to remove any contaminants that may have been introduced during repair. Flushing should be conducted towards the repair location from both directions if possible and should continue until the water is clear.
- Isolate the repaired water main and shut off service connections. Maintain a minimum chlorine residual of 300 mg/l with a minimum contact time of 15 minutes in the isolated water main.
- At the end of the hypochlorite contact time period, flush the water main until the water is clear and chlorine residuals return to normal levels found in the distribution system (if system is chlorinated). In no cases should customers be allowed to consume water with chlorine residual greater than 4.0 mg/l. *Precautions should be taken to ensure that disposal of heavily chlorinated water will not adversely impact the surrounding environment. Use dechlorination methods if necessary. Flush individual service lines to remove heavily chlorinated water.*
- Collect at least one total coliform and HPC bacteria sample from the repaired water main. If the direction of flow is not known, collect samples from each side of the main break.

CONNECTION STARTUP FOR CHLORINATED SYSTEMS ONLY:

- Sequence operation of valve openings to avoid low (or negative) pressure surges. Open valves slowly.
- Free chlorine residuals should be tested at remote areas of the system and chlorine dosages increased until at least a 0.2 mg/l residual is detected at all points in the system.
- If a free chlorine residual cannot be maintained:
 - (i) Consumers should be notified that all water used for drinking and cooking should be boiled at a rolling boil for at least one minute or water should be obtained from an alternate potable source (i.e., bottled water) until notified that the water is safe to drink.
 - (ii) Distribution water samples should be collected immediately in the areas of inadequate chlorine residual and analyzed for total coliform and HPC bacteria.
 - (iii) If all total coliform bacteria results are negative and all HPC bacteria results are less than 500/ml, consumers should be notified that the water is safe to consume; however, if the results are unsatisfactory, boiling notices should remain in effect; and the Drinking Water Section of the Department of Public Health should be notified to discuss further actions.

CONNECTION STARTUP FOR UNCHLORINATED SYSTEMS ONLY:

- Sequence operation of valve openings to avoid low (or negative) pressure surges. Open valves slowly.
- Consumers should be notified that all water used for drinking and cooking should be boiled at a rolling boil for at least one minute or water should be obtained from an alternate potable source (i.e., bottled water) until notified that the water is safe to drink.
- Distribution water samples should be collected as soon as chlorine residual has dissipated and analyzed for total coliform and HPC bacteria.
- If all total coliform bacteria results are negative and all HPC bacteria results are less than 500/ml, consumers should be notified that the water is safe to consume; however, if the results are unsatisfactory, boiling notices should remain in effect; and the Drinking Water Section of the Department of Public Health should be notified to discuss further actions.

JOB COMPLETION:

- Compile job notes that outline the type of repair, particular field conditions and problems encountered, and suggestions/recommendations for avoiding problems on similar jobs.