

February 2015

Pressure Loss and Main Break Response Guidance



PROVIDED TO PUBLIC WATER SYSTEMS
FROM THE WATER QUALITY CONTROL DIVISION

Colorado Department
of Public Health
and Environment

Purpose

The purpose of this guidance is to assist systems that experience a loss of pressure to all or part of their distribution system with the necessary response steps to protect public health while meeting department expectations.

Step 1) Notify all affected customers and department

Water is a vital resource and it is important to stay in communication and work with your affected customers during a pressure loss event. Notifying the department will allow us to assist your system through a pressure loss emergency and accurately represent your system when receiving consumer calls and media requests about the event.

- Notify all affected customers of water outage verbally or using door hangers that contain appropriate information to comply with Section 11.33 of the regulations for Tier 1 events (see attached **Door Hanger Template**).
- Instruct customers to flush their plumbing upon return to service.
- If less than 50% of the distribution system and 100 service connections affected, email the department at cdphe.wqacutes@state.co.us (see attached **Email Template**).
- If greater than 50% of the distribution system or greater than 100 service connections affected, call the department's incident reporting hotline at 1-877-518-5608. Additional public notice to the door hangers below may be necessary.

Step 2) Restore pressure then conduct distribution system flushing and disinfection

After restoring pressure, flushing and disinfection will remove and inactivate contaminants potentially introduced into the distribution system. Dechlorinate any flushed water entering storm sewers with the potential for reaching a stream, river, or lake.

*** Leaks or breaks repaired with clamping devices while the main remains full of pressurized water present little danger of contamination and may not require disinfection or bacteriological sampling. To accomplish this, maintain pressure in the main during the entire repair process. Remember to keep the excavated pit water level below the break and disinfect the interior of all repair parts.*

Guidelines for repairing main breaks with loss of pressure at break site

1. Locate valves and isolate the affected section of distribution system.
2. Excavate to below break utilizing applicable personal protective equipment, shoring, and safety procedures. Plug all pipe openings when unattended.
3. Disinfect (spray or swab) the interior of all repair pipe and fittings with 1% chlorine solution (mix 1 part 8% household bleach with 7 parts water).
4. Repair break.
5. Flush and disinfect affected areas of the distribution system to remove and inactivate contaminants potentially introduced during the repair using one of the following procedures:
 - i. AWWA Standard C651 (available at www.awwa.org).
 - ii. Flush main with a minimum velocity of 3 ft/sec until water is clear then disinfect main with a minimum CT of 100 mg/L- min (e.g. 4 mg/L free chlorine residual for 25 min). CT is a measure of the disinfection process and is the product of disinfectant residual (mg/L) and contact time (min).
 - iii. Department approved Standard Operating Procedures.
6. Check residual disinfectant levels in distribution system are in normal operating range.

Guidelines for flushing and disinfecting entire distribution system following a pressure loss event

1. Increase the disinfectant (chlorine) level leaving the treatment plant and entering the distribution system to between 3 and 4 mg/l (free chlorine).
2. Systematically begin flushing from the entry point of the distribution system outwards to all ends of the distribution system. Verify adequate flushing by measuring for the increased disinfectant residual at each flushing point.
3. Return the disinfectant (chlorine) residual level to the normal operating range and then flush until the disinfectant (chlorine) level at the system's furthest tap is within the normal operating range, generally greater than 0.2 mg/l but less than 2.0 mg/l free chlorine.

Step 3) Bacteriological testing

Bacteriological testing at representative locations throughout the affected areas of the distribution system confirms the effectiveness of the flushing and disinfection procedures. Remember to measure disinfectant (chlorine) levels at the same time you collect bacteriological samples. If any of the bacteriological testing results indicate unsafe conditions (total coliform positive on any single sample), repeat the above flushing and disinfection procedure until all bacteriological testing results indicate safe conditions (all sample locations are total coliform negative).

For systems with less than 50 service connections:

- If pressure loss affects more than 50% of your distribution system, take 3 total coliform samples.

For systems with more than 50 service connections:

- If less than 25 service connections affected, no total coliform samples required.
- If between 25 and 100 service connections affected, take 3 total coliform samples.
- If greater than 100 service connections affected, take 5 total coliform samples

Step 4) Keep Records

Maintain a log of actions taken to fix the problem, flush and disinfect the distribution system, and results of all bacteriological testing.

Door Hanger Template

Water System
EMERGENCY WATER LINE
REPAIR NOTICE

Water service has been shut off due to necessary repairs to the water distribution system in this area.

Repairs will be made as quickly as possible. Service may be interrupted for [redacted] hours from the time listed below.

After we complete repairs, we will flush the water mains in your area. This process may stir up sediment in the pipes and result in discolored water. After we have restored water service, run several cold water taps until the water clears and avoid washing laundry or using hot water.

Customers with compromised immune systems, infants, young children, and elderly may want to consider temporary use of bottled water for drinking, brushing teeth, and food preparation.

We do not anticipate that you will experience any health effects from the repairs to your water service. However, if you develop any unexplained symptoms such as diarrhea, cramps, nausea, and headaches these may be an indication that the water has become contaminated and seek medical advice. Please contact the Colorado Department of Public Health & Environment 24-hour reporting hotline at 1-877-518-5608 with concerns and/or for additional information.

Please share this information with other people who drink this water and call us at [redacted] if you have any questions or need additional information.

Date [redacted]
Time [redacted]

Email Template

SUBJECT: ABC Water Service Water Outage

This email is notification to CDPHE that <<a main break has occurred>> <<water has been lost>> <<maintenance on a main will occur>>. Following, are the specifics:

DATE: 12/09/2012

LOCATION: 3880 Camels Ridge Ln

SIZE OF PIPE: 6" CIP
disruption>>

TYPE OF WORK: <<Repair>> <<Main break>> <<Water supply

ESTIMATED NUMBER OF CUSTOMERS IMPACTED: 11 homes will be (were) without service.

ESTIMATED WORK COMPLETION: Work will be completed as soon as possible and within 24 hours. Subsequent notifications will be made for repairs taking longer than 24 hours.

NOTE: Customers who have been affected by this service interruption have been notified verbally or by door hangers, including special instructions as necessary. Repairs to the main are being performed in accordance with <<the guidelines provided in the WQCD Pressure Loss and Main Break Response Guidance>> <<our WQCD approved Standard Operator Procedures>>.