

Water Main Break Response Protocols for Chlorinated Systems

(In Development - Version 4.30.14)



Steve Deem, P.E.

PNWS AWWA May 2014

Eugene, Oregon

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON

Office of Drinking Water Mission

To protect the health of
the people of
Washington State
by ensuring safe
and reliable
drinking water.



Water Main Break Categories

- **Type I** – Positive pressure maintained during break
 - Pressure maintained in pipe during repair
 - Unlikely contamination intrusion
- **Type II** – Controlled pipe repair with limited depressurization after shutdown
 - Pressure maintained at break site until pipe exposed and hole dewatered, shutdown limited to immediate valved off area, no loss of pressure elsewhere in the system
 - Limited possibility of contamination intrusion

Water Main Break Categories

- **Type III** – Loss of pressure at break site or depressurization elsewhere in the system
 - Loss of pressure at the break site while the pipe is still buried or submerged and / or pressure loss elsewhere in the system
 - Possible / actual contamination intrusion
- **Type IV** – Catastrophic main break / water loss event resulting in complete loss of water service
 - Water loss is extensive compared to system capacity, resulting in no pressure / no water. Storage loss leaves limited flushing capacity
 - Possible / actual contamination intrusion

Type I Main Break Procedures

- Response Procedures
 - Assess environmental impacts – respond accordingly
 - Call Washington 811
 - Excavate to below break
 - Maintain pit water level below break
 - Disinfect repair parts, swab or spray repair site w/ 1% chlorine solution
 - Make repair with pipe still pressurized
 - Restore residual disinfectant level at the break to background levels by flushing
 - No Boil Water Advisory (BWA)
 - No bacteriological samples

Type II Main Break Procedures

- Assess environmental impacts – respond accordingly
- Call Washington 811
- Excavate to below break
- Maintain pit water level below break
- Isolate / shut off customer services in affected area
- Provide customer notification – door hanger, personal contact, email
- Controlled shutdown with established procedures (SOPs)
- Disinfect repair parts, swab or spray repair site w/ 1% chlorine solution
- Make repair
- Conduct low velocity flush to displace water in affected piping
- Restore residual disinfectant level at the break to background levels by flushing
- Instruct customers to flush premise plumbing upon return to service. Verify service restored to all isolated customers
- No Boil Water Advisory (BWA) ***(If don't isolate services is BWA warranted?)***
- Recommend bacteriological samples (HPC) to validate procedures – service restored prior to obtaining results

Type III Main Break Procedures

- Assess environmental impacts – respond accordingly
- Call Washington 811
- Provide generic water main break notification and customer response steps on utility website asap (or directly to customers)
- Evaluate possible contamination including consideration of CCC Program
- Call DOH and local health jurisdiction – decide appropriate public notification message / methods
- Issue BWA – update utility website (System wide or pressure zone specific).
- Isolate / shut off customer services at the break site (if practical)
- Excavate to below break
- Disinfect repair parts, swab or spray repair site w/ 1% chlorine solution
- Make repair
- Post repair disinfection may be needed if an uncontrolled break has allowed contamination to enter the system (Refer to *(new)* AWWA Std C651 Section 4.11)

Type III Main Break Procedures

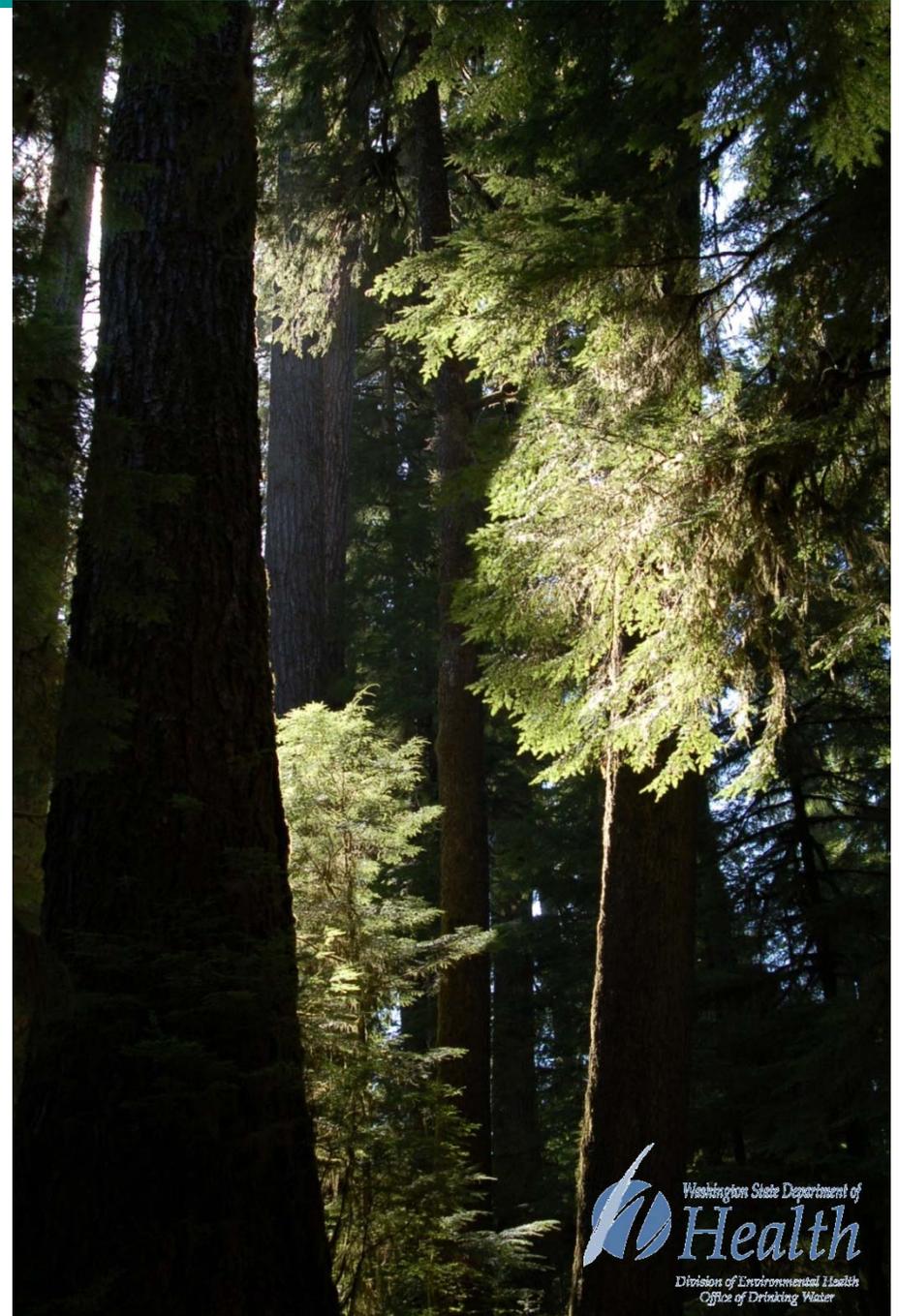
- Conduct scour flush (3 ft/sec) to remove any break related sediment
- Conduct low velocity flush throughout the widespread area subject to low pressures to displace water and to restore background chlorine residual.
- Restore residual disinfectant level at the break to background levels
- Check residual disinfectant level throughout the distribution system
- Instruct customers to flush premise plumbing upon return to service. Verify service restored to all isolated customers
- Collect bacteriological samples to verify the effectiveness of the response and to provide basis for lifting targeted advisories. (More samples may be warranted based on water system size or size of impacted area).
- Rescind BWA/Boil Water Order based on water quality monitoring results.

What about 24 hour BWA?

Type IV Main Break Procedures

- Response to a Type IV break / event will be the same as Type III response procedures with additional emphasis on the following:
 - Assess utility capacity to deal with event – seek aid sooner than later!
 - Significant depletion of storage tank reserves could affect fire flow capability – fire fighters should be notified
 - Storage tank depletion may also impact ability to adequately flush the distribution system following repairs leading in delays to fully restoring water service and lifting the BWA.
 - Conservation messages may therefore need to be included with BWA notification.

Challenges – Areas for
additional discussion?





Steve Deem, P.E.

253.395.6767

steve.deem@doh.wa.gov

PUBLIC HEALTH
ALWAYS WORKING FOR A SAFER AND
HEALTHIER WASHINGTON