



DATE: September 22, 2015

TO: Office of Drinking Water Technical Staff

FROM: John J. Aulbach, P.E., Director   
Office of Drinking Water

SUBJECT: DESIGN AND CONSTRUCTION – Disinfection of Water Mains, Distribution Storage Tanks, Wells and Treatment Facilities

Project Leader: Michelle Caruthers 

Reviewed By: Susan E. Douglas 

SUMMARY STATEMENT:

This memo clarifies ODW's current policy regarding disinfection and bacteriological sampling procedures following construction, maintenance and repair of waterworks facilities.

1. BACKGROUND

Current *Waterworks Regulations* 12VAC5-590-1210 "Disinfection of water mains" provide requirements for disinfection, flushing, pressure testing, and bacteriological sampling of newly constructed water mains. These requirements were in general conformance with previous releases of AWWA Standard C651 "Disinfecting Water Mains".

AWWA originally issued Standard C651 in 1947. On February 1, 2015, AWWA revised the standard and released version C651-14 containing revisions to the disinfecting, flushing, and bacteriological sampling guidelines. Key revisions are summarized below:

1. An additional fourth method of chlorination, 'Spray Disinfection Method' was added to the standard. (Section 4.6)
2. The minimum flushing rate was increased from 2.5 ft/sec to 3 ft/sec.
3. The time required between bacteriological sampling following disinfection was reduced from a minimum of 24 hours, and two options are presented:
  - Option A - Take initial set of samples, then resample after 16 hours.
  - Option B – Allow main sit for 16 hours without water movement, then take first set of samples with a second set of samples after a 15 minute waiting period.

Section 5.1 of C651-14 states that sampling for new mains are to be collected every 1,200 feet, plus one set from the end of the line, and at least one from each branch greater than one pipe length. This standard is more stringent than the current *Waterworks Regulations* requirement of collecting samples every 2,000 feet. Until the *Waterworks Regulations* are amended, testing may be allowed at 2,000 feet intervals; however 1,200 feet should be recommended by ODW staff.

This Working Memo further addresses other disinfection-related AWWA Standards for

- Tanks (C652-11),
- Treatment plant components (C653-13), and
- Wells (C654-13).

An electronic file of all AWWA Standards is available to ODW staff on "ODWSHARE" in the Technical Resources directory. The proposed amended *Waterworks Regulations* will remove the current language regarding disinfection of tanks and waterlines, and will instead refer to AWWA standards.

## 2. NEW WATER MAIN CONSTRUCTION

Construction plans and specifications for water main projects must address disinfection, flushing, pressure testing, and bacteriological sampling. It is ODW's policy to accept AWWA Standards. Specifications that differ from the *Waterworks Regulations* 12VAC5-590-1210, yet meet AWWA Standard C651-14, are acceptable.

## 3. WATER MAIN MAINTENANCE & REPAIR

Waterworks are to adhere to AWWA Standard C651-14 for water line maintenance and repair. Section 5.1.2.1 of the AWWA Standard C651 states that one set of samples may be required for repaired lines that were depressurized or wholly/partially dewatered.

## 4. NEW TANK CONSTRUCTION, MAINTAINENCE & REPAIR

AWWA Standard C652-11 requires a single bacteriological to be collected and analyzed. However, if the sample is positive for coliform, then two consecutive negative repeat samples are required before placing the tank into service. The consecutive samples must be collected a minimum of 16 hours apart.

## 5. NEW WATER TREATMENT PLANTS

AWWA Standard C653-13 Section 5.1 requires two or more bacteriological samples to be collected and tested at least 30 minutes apart following disinfection of treatment units and facilities, before placing units into service.

## 6. WELLS

Bacteriological sampling for new wells is to be conducted in accordance with the *Waterworks Regulations* and WM 813. For servicing, maintenance, or any activity that might lead to the contamination of a well, AWWA Standard C654-13 should be followed for disinfection and bacteriological sampling procedures. In accordance with Section 5.1 of AWWA Standard C654-13, after a well has been chlorinated, allowed to rest for at least 12 hours, and pumped to waste for a minimum of 15 minutes with no detectable chlorine residual, a minimum of two samples shall be collected at least 30 minutes apart.

END OF MEMO