

SECTION 33 13 00 DISINFECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Disinfection of potable water system.
- B. Test and report results.

1.2 REFERENCES

- A. AWWA A100: AWWA Standard for Water Wells.
- B. AWWA B300: AWWA Standard for Hypochlorites.
- C. AWWA B301: AWWA Standard for Liquid Chlorine.
- D. AWWA C651: AWWA Standard for Disinfecting Water Mains.
- E. AWWA C652: AWWA Standard for Disinfection of Water-Storage Facilities.
- F. State of Utah: Public Drinking Water Regulations, Part 2, Section 12.

1.3 DEFINITIONS

- A. Disinfectant Residual: The quantity of disinfectant in treated water.
- B. ppm: Parts per million.

1.4 SUBMITTALS

- A. CONTRACTOR's evidence of experience in disinfection.
- B. Bacteriological laboratory's evidence of certification if laboratory is not OWNER's laboratory.
- C. Disinfection Report: 3 copies containing:
 - 1. Date issued.
 - 2. Project name and location.
 - 3. Treatment contractor's name, address and phone number.
 - 4. Type and form of disinfectant used.
 - 5. Time and date of disinfectant injection started.
 - 6. Time and date of disinfectant injection completed.
 - 7. Test locations.
 - 8. Initial and follow-up disinfectant residuals in ppm for each outlet tested.
 - 9. Time and date of flushing start.
 - 10. Time and date of flushing completion.
 - 11. Disinfectant residual after flushing in ppm for each outlet tested.
 - 12. Flush water disposal location and acceptance by local agency.
- D. Bacteriological Report: 3 copies including:
 - 1. Date issued.
 - 2. Project name and location.
 - 3. Laboratory's name, certification number, address, and phone number.
 - 4. Time and date of water Sample collection.

5. Name of person collecting Samples.
6. Test locations.
7. Time and date of laboratory test start.
8. Coliform bacteria test results for each outlet tested.
9. Certification that water conforms or fails to conform to bacterial standards of State of Utah public drinking water regulations.
10. Bacteriologist's signature.

1.5 QUALITY ASSURANCE

- A. Bacteriological Laboratory: Certified by State of Utah if laboratory is other than OWNER's laboratory.

1.6 PRODUCT HANDLING

- A. Store and protect disinfectant in accordance with manufacturer's recommendations to protect against damage or contamination. Do not use unsuitable disinfectant.
- B. Follow all instruction label for safe handling and storage of disinfectant materials.

1.7 REGULATORY REQUIREMENTS

- A. Conform to State of Utah public drinking water regulations.

PART 2 PRODUCTS

2.1 DISINFECTANT

- A. Liquid Chlorine: AWWA B301 with chlorine 99.5 percent pure by volume.
- B. Sodium Hypochlorite: AWWA B300 with not less than 100 grams per liter available chlorine.
- C. Calcium Hypochlorite: AWWA B300 with 65 to 70 percent available chlorine by weight in granular form.
- D. Powder, tablet, or gas according to manufacturer's specification.

2.2 ALKALI

- A. Caustic Soda or Soda Ash.

2.3 ACID

- A. Hydrochloric (Muriatic) type.

PART 3 EXECUTION

3.1 PREPARATION

- A. Provide necessary signs, barricades, and notices to prevent accidental exposure to disinfecting materials, consuming disinfecting water, or disturbing the system being disinfected.
- B. Make sure the potable water system is complete, clean, and that the system to be disinfected is not connected to the existing system.

3.2 DISINFECTION OF WATER LINES

- A. Use one method defined under AWWA C651 that is acceptable to ENGINEER.
- B. After pressure testing per Section 33 08 00, flush system through hydrants or if a hydrant does not exist, install a tap of sufficient size to provide 2.5 feet per second flushing velocity in the line.
- C. Starting at outlet closest to water source, bleed water from each outlet until chlorine residual reaches outlet. Repeat process at each outlet throughout system.
- D. Collect a bacteriological water sample at end of line to be tested. If sample fails bacteriological test, flush system and retest. Continue flushing and retesting until a good sample is obtained.
- E. If flushing does not produce a passing bacteriological test disperse disinfectant throughout system to obtain 10 to 25 ppm of free chlorine residual.
- F. Flush the chlorinated water from the main until chlorine measurements show the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.
- G. After a negative bacteriological sample is obtained, let the system relax for 24 hours. Flush and collect a subsequent bacteriological sample for testing. If the subsequent test is negative then water line is acceptable.

3.3 DISINFECTION OF CULINARY WELLS

- A. Use one method defined under AWWA A100 that is acceptable to ENGINEER.
- B. Do not start disinfection until well is thoroughly cleaned.
- C. Use a disinfecting solution containing a minimum of 50 ppm residual chlorine.
- D. Flush system after disinfection.

3.4 DISINFECTION OF WATER STORAGE RESERVOIRS

- A. Use one method defined under AWWA C652 that is acceptable to the ENGINEER.
- B. Do not start disinfection until water storage tank is thoroughly cleaned.
- C. Provide and use necessary safety equipment for workers in contact with disinfectant or gasses.
- D. Flush system after disinfection.

3.5 FIELD QUALITY CONTROL

- A. Bacteriological Test:
 - 1. Collect Samples for testing no sooner than 16 hours after system flushing.
 - 2. Analyze water samples per State of Utah requirements.
 - 3. If bacteriological test proves water quality to be unacceptable, repeat system treatment.
 - 4. Do not place water systems into service until a negative bacteriological test is made. Provide a copy of the negative bacteriological test to ENGINEER.
- B. Disposal of Disinfectant:
 - 1. Legally dispose of disinfecting water and ensure no chlorine buildup or damage to the environment.

END OF SECTION