



Guidelines for Demonstration of
Onsite Sodium Hypochlorite
Generators to Meet Inactivation/Disinfection
Requirements of Drinking Water

Division: DDAGW
Number: ENG-12-001
Category: Engineering - Guidance
Status: Final
Issued: October 6, 2010

I. PURPOSE

The purpose of this guidance is to suggest a potential means of obtaining plan approval for installation and use of onsite sodium hypochlorite generators to satisfy disinfection requirements in the Ohio Administrative Code (OAC) rules. The use of onsite sodium hypochlorite generators has not yet been shown to be a reliable method of satisfying disinfection requirements in the State of Ohio. This guidance is not intended to create any new requirement but is merely one proposed approach. Nothing herein should be interpreted as precluding other strategies to complying with the requirements of the disinfection rules.

II. REGULATIONS WHICH MAY HAVE AN IMPACT ON USE OF AN ONSITE SODIUM HYPOCHLORITE GENERATOR

- Community and noncommunity public drinking water systems serving at least 1,000 persons are required by paragraph (C) of OAC rule 3745-83-01 to maintain a minimum chlorine residual of 0.2 milligrams per liter (mg/L) free chlorine (or 1.0 mg/L combined chlorine) at representative points throughout the distribution system. Community and noncommunity public drinking water systems that supply water treated with chlorine must also meet the maximum disinfection residual levels of paragraph (C) of OAC rule 3745-81-10.
- Surface water systems must meet CT requirements of OAC rule 3745-81-72 to demonstrate inactivation of *Giardia lamblia* and viruses.
- OAC rule 3745-81-72 requires all surface water systems to submit a disinfection profile and benchmark for review prior to changing disinfectants or making a significant change to their disinfection practice.
- The federal Ground Water Rule, which became effective on January 8, 2007 with a compliance date of December 1, 2009, requires compliance monitoring for residual disinfectant concentration at ground water systems that provide 4-log treatment of viruses.
- OAC rule 3745-91-02 requires all public water systems to obtain approval before adding chemical feed systems.

- Paragraph (D) of OAC rule 3745-83-01 requires all chemicals and materials which will come into contact with drinking water to have American National Standards Institute (ANSI)/National Science Foundation (NSF) 60 or 61 approval.
- Paragraph (C) of OAC rule 3745-81-24 requires all community and nontransient noncommunity public drinking water systems that treat their water with chlorine to monitor for total trihalomethanes and haloacetic acids five.

III. APPLICABLE GUIDANCE

Great Lakes Upper Mississippi River Board of State Public Health and Environmental Managers. 2007. *Recommended Standards for Water Works (also referred to as "Ten States Standards")*. Health Research Inc., Albany, NY.

USEPA. 1997, *Small System Compliance Technology List for the Surface Water Treatment Rule*, EPA 815-R-97-002, Office of Water, Washington, D.C.

IV. PROCEDURE

In order to demonstrate the ability of an onsite sodium hypochlorite generator to maintain an adequate chlorine residual in the distribution system, a full scale demonstration study must be performed with a system capable of treating the full production stream of the water treatment plant in accordance with section 1.1.8 of *Recommended Standards for Water Works, 2007 edition*. Therefore, plans for such a sodium hypochlorite generation system, prepared in accordance with OAC Chapter 3745-91 must be reviewed and approved by Ohio EPA before installation. Approval of the plans will contain a condition requiring a successful full scale demonstration study of the onsite sodium hypochlorite generator within six months of the installation of the system. Additionally, a protocol for the full scale demonstration study is strongly recommended to be included with the plan submittal in order to ensure adequate data is collected.

During the full scale demonstration study and until the demonstration study has been accepted, the water system must also have in place a fully capable backup disinfection system which can be placed in operation within one hour, in the event a problem is encountered with the onsite sodium hypochlorite generator system. Following completion of the study the system must submit to Ohio EPA for acceptance a report indicating the results of the study. Should the demonstration study not be successful, the onsite sodium hypochlorite generator will not be approved for use and the backup disinfection will need to be used. The public water system must meet all applicable disinfection requirements during the full scale demonstration study.

INFORMATION TO INCLUDE IN THE FULL SCALE DEMONSTRATION STUDY PROTOCOL

- 1.0 Graph of chlorine residual data used for calculating CT for the previous 12 month period.
- 1.1 Statement of objectives and conclusions from evaluation of the chlorine residual data to identify critical conditions to be evaluated during the demonstration study.
- 1.2 Schematic drawing and detailed description of the demonstration study facility and how the proposed facility relates to the existing treatment process.
- 1.3 Time schedule for the study; should include time period in which critical conditions could be expected to occur. A data collection period of at least 60 days is recommended.
- 1.4 Monitoring schedule which indicates sampling locations, parameters to be monitored at each location, and frequency of monitoring for each location.
- 1.5 Description of analytical equipment and methods to be used for monitoring each parameter.
- 1.6 Quality assurance/quality control procedures to be used.
- 1.7 Monitoring locations and frequency for chlorine residual consistent with the current chlorine residual monitoring requirements. In addition, chlorine residual must be measured at the clearwell effluent in order to demonstrate the ability of the sodium hypochlorite generator to provide accurate feed rates as outlined in Section 5.0.3.a of *Recommended Standards for Water Works, 2007 edition*.
- 1.8 Daily CT values for systems treating surface waters, calculated to determine compliance with requirements of OAC rule 3745-81-72.
- 1.9 Statement of finished water goals for the study that, as a minimum, meet the approval criteria indicated in the Section V of these guidelines.
- 1.10 Statement indicating analysis of the data to be provided in the report.

V. APPROVAL CRITERIA

During the full scale demonstration study, the water system must show the ability to meet the CT disinfection requirements (at surface water treatment plants and at ground water treatment plants providing 4-log treatment under the Ground Water Rule) and the distribution chlorine residual requirements of the OAC rules. The water system must also show the ability to maintain a minimum target chlorine residual for at least 95% of

the samples at the clearwell effluent to show adequate control of the process, as proof of the ability to meet Section 5.0.3.a of *Recommended Standards For Water Works, 2007 edition*, which addresses accuracy in chemical feed systems.

IV. HISTORY:

The Division of Drinking and Ground Waters first issued this guidance on October 6, 2010.