Nebraska Admin. Code Title 179, Ch. *13*

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Nebraska State Rules & Regulations > ***TITLE 179*. PUBLIC WATER SYSTEMS (DEPARTMENT OF HEALTH AND HUMAN SERVICES)**

CHAPTER *13*. SURFACE WATER TREATMENT

13-001 **SCOPE AND AUTHORITY:** These regulations establish treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella*, and turbidity. The authority is found in Neb. Rev. Stat. §§ 71-5301 to 71-5313.

13-005 **DISINFECTION:** A public water system that uses a ground water source under the direct influence of surface water and does not provide filtration treatment must provide disinfection treatment specified in ***179 NAC 13***-005.01 beginning 18 months after the Director determines that the ground water source is under the direct influence of surface water. If filtration is required in accordance with ***179 NAC 13***-006, the system must comply with any interim disinfection requirements the Director deems necessary before filtration is installed. A system that uses a surface water source and provides filtration treatment must provide the disinfection treatment specified in ***179 NAC 13***-005.02 beginning June 29, 1993, or beginning when filtration is installed, whichever is later. A system that uses a ground water source under the direct influence of surface water and provides filtration treatment must provide disinfection treatment as specified in ***179 NAC 13***-005.02 by June 29, 1993, or beginning when filtration is installed, whichever is later. Failure to meet any requirement of ***179 NAC 13***-005 is a treatment technique violation.

13-005.01 **Disinfection Requirements for Public Water Systems That Do Not Provide Filtration:** Each public water system that uses a ground water source under the direct influence of surface water and does not provide filtration treatment must provide disinfection treatment as follows:

13-005.01A The disinfection treatment must be sufficient to ensure at least 99.9% (3-log) inactivation of *Giardia lamblia* cysts and 99.99% (4-log) inactivation of viruses, every day the system serves water to the public, except any one day each month. Each day a system serves water to the public, the public water system must calculate the CT value(s) from the system's treatment parameters, using the procedure specified in ***179 NAC 13***-007.02D and determine whether this value(s) is sufficient to achieve the specified inactivation rates for *Giardia lamblia* cysts and viruses. If a system uses a disinfectant other than chlorine, the system owner may demonstrate to the Director that CT[(99.9)] values other than those specified in Tables ***13***.7 and ***13***.8 in ***179 NAC 13***-007.02C or other operational parameters are adequate to demonstrate that the system is achieving minimum inactivation rates required by ***179 NAC 13***-005.

13-005.01B The disinfection system must have either redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system, or automatic shut-off of delivery of water to the distribution system whenever there is less than 0.2 milligrams (mg) per liter of residual disinfectant concentration in the water. If the Director determines that automatic shut-off would cause unreasonable risk to health or interference with fire protection, the system must have the above redundant components.

13-005.01C The residual disinfectant concentration in the water entering the distribution system, measured as specified in ***179 NAC 13***-007.01B and ***13***-007.02E cannot be less than 0.2 mg per liter for more than four hours.

13-005.01D **Residual Disinfectant Concentration**

13-005.01D1 The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide as specified in ***179 NAC 13***-007.01B and ***13***-007.02F must be detectable, as defined in Attachment 1 which is hereby incorporated by reference, in at least 95% of the samples each month for any two consecutive months that the

system serves water to the public. Thus, the value "V" in the following formula cannot exceed 5% in one month for any two consecutive months.

V = (c+d+e)/(a+b) x 100

Where:

a = number of instances where residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured, but heterotrophic bacteria plate count (HPC) is measured;

c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = number of instances where the residual disinfectant concentration is measured but not detected and where the HPC is greater than 500 ml;

e = number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500 per ml; and

V = percent of samples with undetectable residual disinfectant concentration.

13-005.01D2 If the Director determines, based on site-specific considerations, that a system does not have the means for having a sample transported and analyzed for heterotrophic plate count (HPC) by the Department Laboratory or an approved laboratory under the requisite time and temperature conditions required of the laboratory and that the system is providing adequate disinfection in the distribution system, the requirements of ***179 NAC 13***-005.01D1 do not apply to that system.

13-005.02 **Disinfection Requirements for Public Water Systems Which Provide Filtration:** Each public water system that provides filtration treatment must provide disinfection treatment as follows:

13-005.02A The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9% (3-log) inactivation and/or removal of *Giardia lamblia* cysts and at least 99.99% (4-log) inactivation and/or removal of viruses, as determined by the Director.

13-005.02B The residual disinfectant concentration in the water entering the distribution system, measured as specified in ***179 NAC 13***-007.01B and ***13***-007.03B cannot be less than 0.2 mg per liter for more than four hours.

13-005.02C The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in ***179 NAC 13***-007.01B and ***13***-007.03B must be detectable, as defined in Attachment 1 in at least 95% of the samples each month, for any two consecutive months that the system serves water to the public. Thus, the value "V" in the following formula cannot exceed 5% in one month, for any two consecutive months.

V = (c+d+e)/(a+b) x 100

Where:

a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is not measured but heterotrophic bacteria plate count (HPC) is measured;

c = number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured;

d = number of instances where no residual disinfectant concentration is detected and where the HPC is greater than 500 per ml;

e = number of instances where the residual disinfectant concentration is not measured and HPC is greater than 500 per ml; and

V = percent of samples with undetectable residual disinfectant concentration.

If the Director determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by the Department Laboratory or an approved laboratory under the requisite time and temperature conditions required of the laboratory and that the system is providing adequate disinfection in the distribution system, the requirements of ***179 NAC 13***-005.02C do not apply.

179 NAC 13 Attachment 1

Minimum Detectable Residuals

A. The following requirements establish the minimum allowable disinfectant residuals for each type of system.

1. For systems that are utilizing surface water sources, or sources determined to be groundwater under the direct influence of surface water, one of the following options must be implemented to meet the minimum residual requirements.

a. 0.2 ppm residual for free chlorine or 0.5 ppm for total chlorine or

b. 0.1 ppm residual for free chlorine or 0.25 ppm for total chlorine provided the requirements in Section C items 1-5 of this attachment are met or

c. HPC of <500 cfu/ml.

2. All groundwater systems serving water to the public that contains chlorine or chloramines as a chemical disinfectant or oxidant on a continuous basis must use one of the following criteria for minimum residuals.

a. 0.1 ppm residual for free chlorine or

b. 0.05 ppm for free chlorine if qualifying criteria in section C items 3-5 of this attachment are met or

c. HPC of <500 cfu/ml.

B. If a system is required to disinfect under an Administrative Order (AO), the requirements listed in the AO will supersede any requirements for minimum residuals established in this attachment.

C. In order for a system to maintain the lower minimum residual requirement for free or total chlorine (referred to in A, items 1.b. and 2.b.), the following criteria must be met:

1. Any public water system using surface water or ground water under the direct influence of surface water must meet or exceed all CT inactivation requirements in ***179 NAC 13***., Tables ***13***.1 to ***13***.8 at all times through the treatment process in order to utilize the lower requirements of A, item 1.b.

2. Any public water system using surface water, or ground water determined to be under the direct influence of surface water, must maintain effluent turbidity levels of less than or equal to 0.3 NTU in 95% of all readings, and at no time exceed 1 NTU.

A system may submit a study to the Department showing that turbidity values in excess of the specified turbidity limits are a direct result of the treatment process and do not represent a threat to public health. The Department will review the study to determine the nature of the high turbidity levels and if they pose a threat to public health.

3. The system must demonstrate that the field test method being used can consistently, reliably, and precisely measure residuals less than or equal to the specified limit being used.

4. The system must document that the manufacturer's recommendations for calibration or standardization are being done according to manufacturer's specifications and frequency, and make this information available for review during sanitary surveys.

5. The system must demonstrate that there is no interference with the testing method, or document that interference has been corrected for. This can be done by any one of the following methods:

a. Demonstration through historical source water data (a minimum of 12 months of data, or at least four quarterly samples for non-transient non-community systems) that no interference listed under the manufacturer's instructions is present in the system.

b. Sampling for applicable interferences once each day that a residual disinfectant compliance sample(s) is taken to obtain a correction factor to be added to all residual compliance samples taken that day.

c. Using an EPA approved method that provides a correction for interference as part of the procedure, and documenting all corrections.

d. Adjusting all results based on stable historical data and adding the maximum interference obtained, with the Department's approval.

D. Disinfectant residuals must be at or above the required minimum residual limits in at least 95% of all distribution residuals taken for the month. If the system fails to meet the 95% requirement for two consecutive months, or for ≥ 50% of the previous 12 consecutive months, the system will be deemed to be in violation of prescribed treatment techniques and will be issued a Treatment Technique violation.

NEBRASKA STATE RULES & REGULATIONS
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