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not detected and where the HPC is >500/ml; and  
e=number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

(ii) If the State determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by §141.74(a)(3) and that the system is providing adequate disinfection in the distribution system, the requirements of paragraph (a)(4)(i) of this section do not apply to that system.

(b) *Disinfection requirements for public water systems which provide filtration.* Each public water system that provides filtration treatment must provide disinfection treatment as follows.

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

(2) The residual disinfectant concentration in the water entering the distribution system, measured as specified in §141.74 (a)(5) and (c)(2), cannot be less than 0.2 mg/l for more than 4 hours.

(3)(i) The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in §141.74 (a)(5) and (c)(3), cannot be undetectable in more than 5 percent of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in §141.74(a)(3), is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 percent in one month, for any two consecutive months.

$$V = \frac{c+d+e}{a+b} \times 100$$

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 >500/ml; and

e=number of instances where the residual disinfectant concentration is not measured and HPC is >500/ml.

(ii) If the State determines, based on site-specific considerations, that a system has no means for having a sample transported and analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified in §141.74(a)(3) and that the system is providing adequate disinfection in the distribution system, the requirements of paragraph (b)(3)(i) of this section do not apply.

EFFECTIVE DATE NOTE: At 69 FR 38855, June 29, 2004, §141.72 was amended in paragraph (a)(3) by removing the citation "§141.74(a)(5)" and adding in its place "§141.74(a)(2)"; in paragraph (a)(4)(i) by removing the citation "§141.74(a)(5)" and adding in its place "§141.74(a)(2)" and by removing the citation "§141.74(a)(3)" and adding in its place "§141.74(a)(1)"; in paragraph (a)(4)(ii) by removing the citation "§141.74(a)(3)" and adding in its place "§141.74(a)(1)"; in paragraph (b)(2) by removing the citation "§141.74(a)(5)" and adding in its place "§141.74(a)(2)"; in paragraph (b)(3)(i) by removing the citation "§141.74(a)(5)" and adding in its place "§141.74(a)(2)" and by removing the citation "§141.74(a)(3)" and adding in its place "§141.74(a)(1)"; and in paragraph (b)(3)(ii) by removing the citation "§141.74(a)(3)" and adding in its place "§141.74(a)(1)", effective July 29, 2004.

§ 141.73 Filtration.

A public water system that uses a surface water source or a ground water source under the direct influence of surface water, and does not meet all of the criteria in §141.71 (a) and (b) for avoiding filtration, must provide treatment consisting of both disinfection, as specified in §141.72(b), and filtration treatment which complies with the requirements of paragraph (a), (b), (c), (d), or (e) of this section by June 29, 1993, or within 18 months of the failure to meet any one of the criteria for

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avoiding filtration in §141.71 (a) and (b), whichever is later. Failure to meet any requirement of this section after the date specified in this introductory paragraph is a treatment technique violation.

(a) *Conventional filtration treatment or direct filtration.* (1) For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 NTU in at least 95 percent of the measurements taken each month, measured as specified in §141.74 (a)(4) and (c)(1), except that if the State determines that the system is capable of achieving at least 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts at some turbidity level higher than 0.5 NTU in at least 95 percent of the measurements taken each month, the State may substitute this higher turbidity limit for that system. However, in no case may the State approve a turbidity limit that allows more than 1 NTU in more than 5 percent of the samples taken each month, measured as specified in §141.74 (a)(4) and (c)(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU, measured as specified in §141.74 (a)(4) and (c)(1).

(3) Beginning January 1, 2002, systems serving at least 10,000 people must meet the turbidity requirements in §141.173(a).

(4) Beginning January 14, 2005, systems serving fewer than 10,000 people must meet the turbidity requirements in §§141.550 through 141.553.

(b) *Slow sand filtration.* (1) For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, measured as specified in §141.74 (a)(4) and (c)(1), except that if the State determines there is no significant interference with disinfection at a higher turbidity level, the State may substitute this higher turbidity limit for that system.

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU,

measured as specified in §141.74 (a)(4) and (c)(1).

(c) *Diatomaceous earth filtration.* (1) For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, measured as specified in §141.74 (a)(4) and (c)(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU, measured as specified in §141.74 (a)(4) and (c)(1).

(d) *Other filtration technologies.* A public water system may use a filtration technology not listed in paragraphs (a) through (c) of this section if it demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of §141.72(b), consistently achieves 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts and 99.99 percent removal and/or inactivation of viruses. For a system that makes this demonstration, the requirements of paragraph (b) of this section apply. Beginning January 1, 2002, systems serving at least 10,000 people must meet the requirements for other filtration technologies in §141.173(b). Beginning January 14, 2005, systems serving fewer than 10,000 people must meet the requirements for other filtration technologies in §141.550 through 141.553.

[54 FR 27527, June 29, 1989, as amended at 63 FR 69516, Dec. 16, 1998; 66 FR 3776, Jan. 16, 2001; 67 FR 1836, Jan. 14, 2002]

EFFECTIVE DATE NOTE: At 69 FR 38855, June 29, 2004, §141.73 was amended in paragraph (a)(1) by removing both citations “§141.74(a)(4)” and adding in their place “§141.74(a)(1)”; in paragraph (a)(2) by removing the citation “§141.74(a)(4)” and adding in its place “§141.74(a)(1)”; in paragraph (a)(4) by removing the date “January 14, 2005” and adding in its place “January 1, 2005”; in paragraph (b)(1) by removing the citation “§141.74(a)(4)” and adding in its place “§141.74(a)(1)”; in paragraph (b)(2) by removing the citation “§141.74(a)(4)” and adding in its place “§141.74(a)(1)”; in paragraph (c)(1) by removing the citation “§141.74(a)(4)” and adding in its place “§141.74(a)(1)”; and in paragraph (c)(2) by removing the citation

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“§141.74(a)(4)” and adding in its place “§141.74(a)(1)”, effective July 29, 2004.

**§ 141.74 Analytical and monitoring requirements.**

(a) *Analytical requirements.* Only the analytical method(s) specified in this paragraph, or otherwise approved by EPA, may be used to demonstrate compliance with §§141.71, 141.72 and 141.73. Measurements for pH, turbidity, temperature and residual disinfectant concentrations must be conducted by a person approved by the State. Measurement for total coliforms, fecal coliforms and HPC must be conducted by a laboratory certified by the State or EPA to do such analysis. Until laboratory certification criteria are developed for the analysis of fecal coliforms and HPC, any laboratory certified for total coliforms analysis by the State or EPA is deemed certified for fecal coliforms and HPC analysis. The following procedures shall be conducted in accordance with the publications listed in the following section. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the methods published in *Standard Methods for the Examination of Water and Wastewater* may be obtained from the American Public Health Association et al., 1015 Fifteenth Street, NW., Washington, DC 20005; copies of the Minimal Medium ONPG–MUG Method as set forth in the article “National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and *Esherichia coli* from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method” (Edberg et al.), *Applied and Environmental Microbiology*, Volume 54, pp. 1595–1601, June 1988 (as amended under Erratum, *Applied and Environmental Microbiology*, Volume 54, p. 3197, December, 1988), may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, Colorado, 80235; and copies of the Indigo Method as set forth in the article “Determination of Ozone in Water by the Indigo Method” (Bader and Hoigne), may be obtained from Ozone Science & Engineering, Pergamon Press Ltd., Fairview Park,

Elmsford, New York 10523. Copies may be inspected at the U.S. Environmental Protection Agency, Room EB15, 401 M St., SW., Washington, DC 20460 or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(1) Public water systems must conduct analysis of pH and temperature in accordance with one of the methods listed at §141.23(k)(1). Public water systems must conduct analysis of total coliforms, fecal coliforms, heterotrophic bacteria, and turbidity in accordance with one of the following analytical methods and by using analytical test procedures contained in *Technical Notes on Drinking Water Methods*, EPA–600/R–94–173, October 1994, which is available at NTIS PB95–104766.

Organism	Methodology	Citation <sup>1</sup>
Total Coliform <sup>2</sup> .....	Total Coliform Fermentation Technique <sup>3,4,5</sup> .	9221 A, B, C
	Total Coliform Membrane Filter Technique <sup>6</sup> .	9222 A, B, C
Fecal Coliforms <sup>2</sup> ...	ONPG–MUG Test <sup>7</sup>	9223
	Fecal Coliform Procedure <sup>8</sup> .	9221 E
	Fecal Coliform Filter Procedure.	9222 D
Heterotrophic bacteria <sup>2</sup> .	Pour Plate Method	9215 B
	SimPlate <sup>11</sup> .	
Turbidity .....	Nephelometric Method.	2130 B
	Nephelometric Method.	180.1 <sup>9</sup>
	Great Lakes Instruments.	Method 2 <sup>10</sup>
	Hach FilterTrak ....	10133 <sup>12</sup>

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents listed in footnotes 1, 6, 7 and 9–12 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800–426–4791. Documents may be inspected at EPA’s Drinking Water Docket, 1301 Constitution Avenue, NW., EPA West, Room B102, Washington DC 20460 (Telephone: 202–566–2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

<sup>1</sup>Except where noted, all methods refer to *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992), 19th edition (1995), or 20th edition (1998), American Public Health Association, 1015 Fifteenth Street, NW., Washington, DC 20005. The cited methods published in any of these three editions may be used.