



## Analytical Methods Approved for Compliance Monitoring under the Surface Water Treatment Coliform Rule

Analysis for the following contaminants shall be conducted in accordance with the methods in the following table, or their equivalent as determined by EPA. The methods and monitoring requirements for these contaminants are specified in 40 CFR 141.74(a)(1). Additional methods are listed in Appendix A to Subpart C of Part 141.

*The CFR is the legal reference for approved methods and takes precedent over this table. The table should accurately reflect the analytical methods information published in 40 CFR 141. If discrepancies are found, please notify the Safe Drinking Water Hotline (800-426-4791) so that EPA can correct the table.*

### §141.74(a)(1)– Analytical and monitoring requirements

#### (a)(1) Analytical requirements

(1) The time from sample collection to initiation of analysis may not exceed 8 hours. Systems must hold samples below 10 °C during transit.

The procedures must be done in accordance with the documents listed at §141.74(a)(1) or one of the alternative methods listed in Appendix A to Subpart C of Part 141. For Standard Methods Online, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits following the hyphen in the method number. The methods listed are the only online versions of the method that maybe used. For vendor methods, the date of the method listed in §141.74(a)(1) or Appendix A to Subpart C of Part 141 is the date/version of the approved method. The methods listed are the only versions that may be used for compliance with this rule. Laboratories should be careful to use only the approved versions of the methods as product packaging inserts may not be the same as the approved versions of the methods.

### Contaminant

Total Coliforms - lactose fermentation methods:

Method	Organization	Reference Title	Date	Notes
9221 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 18<sup>th</sup> Edition</i>	1992	Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.

Method	Organization	Reference Title	Date	Notes
				<p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 19<sup>th</sup> Edition</i>	1995	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> Edition</i>	1998	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition</i>	2005	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> Edition</i>	2012	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the</p>

Method	Organization	Reference Title	Date	Notes
				<p>water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C-99	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1999	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>
9221 A, B, C-06	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2006	<p>Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested, and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.</p> <p>Media should cover inverted tubes at least one-half to two-thirds after the sample is added.</p> <p>No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.</p>

## Total coliforms - membrane filtration methods:

Method	Organization	Reference Title	Date	Notes
9222 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 18 <sup>th</sup> Edition	1992	

Method	Organization	Reference Title	Date	Notes
9222 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19 <sup>th</sup> Edition	1995	
9222 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 <sup>th</sup> Edition	1998	
9222 A, B, C	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 <sup>st</sup> Edition	2005	
9222 A, B, C-97	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	
1604	EPA	Method 1604: Total Coliforms and <i>Escherichia coli</i> in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium), September 2002	2002	

## Total coliforms - enzyme substrate methods:

Method	Organization	Reference Title	Date	Notes
9223 Colilert	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 18 <sup>th</sup> Edition	1992	
9223 Colilert	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19 <sup>th</sup> Edition	1995	
9223 Colilert	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 <sup>th</sup> Edition	1998	
9223 Colilert	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 <sup>st</sup> Edition	2005	
9223 B Colilert	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 22 <sup>nd</sup> Edition	2012	

Method	Organization	Reference Title	Date	Notes
9223 B-97 Colilert	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	
9223 B-04 Colilert	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	

## Contaminant

Fecal coliforms – Fecal Coliform Procedure (following Lactose Fermentation Methods):

Method	Organization	Reference Title	Date	Notes
9221 E	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 18<sup>th</sup> Edition</i>	1992	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 19<sup>th</sup> Edition</i>	1995	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> Edition</i>	1998	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition</i>	2005	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> Edition</i>	2012	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C
9221 E-99	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1999	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C

Method	Organization	Reference Title	Date	Notes
9221 E-06	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2006	A-1 broth may be held up to 7 days in a tightly closed screw cap tube at 4°C

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Fecal coliforms – membrane filtration methods:

Method	Organization	Reference Title	Date	Notes
9222 D	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 18 <sup>th</sup> Edition	1992	
9222D	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 19 <sup>th</sup> Edition	1995	
9222 D	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 20 <sup>th</sup> Edition	1998	
9222D	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 21 <sup>st</sup> Edition	2005	
9222 D	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater</i> , 22 <sup>nd</sup> Edition	2012	
9222 D-97	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	1997	
9222 D-06	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2006	

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Heterotrophic bacteria – culture method:

Method	Organization	Reference Title	Date	Notes
9215 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 18<sup>th</sup> Edition</i>	1992	
9215 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 19<sup>th</sup> Edition</i>	1995	
9215 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> Edition</i>	1998	
9215 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition</i>	2005	
9215 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> Edition</i>	2012	
9215 B-00	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2000	
9215 B-04	Standard Methods Online	Online version. Approval year is designated by the last 2 digits. Only online versions cited in the regulations or in Appendix A to Subpart C of Part 141 are approved.	2004	

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Heterotrophic bacteria - enzyme substrate methods:

Method	Organization	Reference Title	Date	Notes
Simplate	IDEXX	IDEXX SimPlate™ HPC test method for Heterotrophs in Water, November 2000	2000	

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## Turbidity methods:

Method	Organization	Reference Title	Date	Notes
2130 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 18<sup>th</sup> Edition</i>	1992	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 19<sup>th</sup> Edition</i>	1995	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 20<sup>th</sup> Edition</i>	1998	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition</i>	2005	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
2130 B	Standard Methods	<i>Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> Edition</i>	2012	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
180.1	EPA	Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993	1993	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
Method 2	Great Lakes Instruments	Great Lakes Instruments Method 2, Turbidity, November 2, 1992	1992	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
10133	Hach	Hach FilterTrak Method 10133, Revision 2.0, Determination of Turbidity by Laser Nephelometry, January 2000	2000	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
M5271	Leck Mitchell	Mitchell Method M5271, Revision 1.1, Determination of Turbidity by Laser Nephelometry, March 5, 2009	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin



Method	Organization	Reference Title	Date	Notes
M5331	Leck Mitchell	Mitchell Method M5331, Revision 1.1, Determination of Turbidity by LED Nephelometry, March 5, 2009	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
AMI Turbiwell	Swan Analytische Instrumente AG	Continuous Measurement of Turbidity Using A SWAN AMI Turbiwell Turbidimeter, August 2009	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
AQ4500	Thermo Scientific	Orion Method AQ4500, Revision 1.0, Determination of Turbidity by LED Nephelometry, May 8, 2009	2009	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
M5331 (Rev. 1.2)	Leck Mitchell	Mitchell Method M5331, Revision 1.2 Determination of Turbidity by LED or Laser Nephelometry, February 2016	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin
10258	Hach Company	Hach Method 10258, Determination of Turbidity by 360° Nephelometry, January 2016	2016	Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin