6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 141

[EPA-HQ-OW-2017-0284; FRL-9964-78-OW]

Expedited Approval of Alternative Test Procedures for the Analysis of Contaminants under the Safe Drinking Water Act; Analysis and Sampling Procedures

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action announces the U.S. Environmental Protection Agency's (EPA's) approval of alternative testing methods for use in measuring the levels of contaminants in drinking water and determining compliance with national primary drinking water regulations. The Safe Drinking Water Act authorizes EPA to approve the use of alternative testing methods through publication in the Federal Register. EPA is using this streamlined authority to make 17 additional methods available for analyzing drinking water samples. This expedited approach provides public water systems, laboratories, and primacy agencies with more timely access to new measurement techniques and greater flexibility in the selection of analytical methods, thereby reducing monitoring costs while maintaining public health protection.

DATES: This action is effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA-HQ-OW-2017-0284. All documents in the docket are listed on the http://www.regulations.gov website. Although listed in the index, some information is not publicly available, e.g.,

confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through http://www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: The Safe Drinking Water Hotline (800) 426-4791 or Glynda Smith, Technical Support Center, Standards and Risk Management Division, Office of Ground Water and Drinking Water (MS 140), Environmental Protection Agency, 26 West Martin Luther King Drive, Cincinnati, OH 45268; telephone number: (513) 569-7652; e-mail address: smith.glynda@epa.gov.

SUPPLEMENTARY INFORMATION:

I. General Information

A. *Does this Action Apply to Me?*

Public water systems are the regulated entities required to measure contaminants in drinking water samples. In addition, EPA Regions as well as states and tribal governments with authority to administer the regulatory program for public water systems under the Safe Drinking Water Act (SDWA) may measure contaminants in water samples. When EPA sets a monitoring requirement in its national primary drinking water regulations for a given contaminant, the agency also establishes (in the regulations) standardized test procedures for analysis of the contaminant. This action makes alternative testing methods available for particular drinking water contaminants beyond the testing methods currently established in the regulations. EPA is providing public water systems, required to test water samples, with a choice of using either a test procedure already established in the existing regulations or an alternative testing method that has been approved in this action or in prior expedited approval actions. Categories and entities

that may ultimately be affected by this action include:

Category	Examples of potentially regulated entities	NAICS[1]
State, local, & tribal governments	State, local and tribal governments that analyze water samples on behalf of public water systems required to conduct such analysis; state, local and tribal governments that directly operate community and non-transient non-community water systems required to monitor.	924110
Industry	Private operators of community and non-transient non-community water systems required to monitor.	221310
Municipalities	Municipal operators of community and non-transient non-community water systems required to monitor.	924110

[1]North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be interested in this action. This table lists the types of entities that EPA is now aware could potentially be affected by this action. Other types of entities not listed in the table could also have some interest. To determine whether your facility is affected by this action, you should carefully examine the applicability language in the Code of Federal Regulations (CFR) at 40 CFR 141.2 (definition of a public water system). If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Abbreviations and Acronyms Used in this Action

APHA: American Public Health Association

ATP: Alternate Test Procedure

CBI: Confidential Business Information

CFR: Code of Federal Regulations

EPA: United States Environmental Protection Agency

GWR: Ground Water Rule

HAA: Haloacetic Acid

HAA5: Haloacetic Acids (five) (sum of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid and dibromoacetic acid)

IC: Ion Chromatography

ISFETs: Ion Selective Field Effect Transistors

LED: Light Emitting Diode

NAICS: North American Industry Classification System

QC: Quality Control

RTCR: Revisions to the Total Coliform Rule

SDWA: The Safe Drinking Water Act

SM: Standard Method

TCR: Total Coliform Rule

VCSB: Voluntary Consensus Standard Bodies

II. Background

A. What is the Purpose of This Action?

In this action, EPA is approving 17 analytical methods for determining contaminant concentrations in drinking water samples collected under SDWA. Regulated parties required to sample and monitor may use either the testing methods already established in existing regulations or the alternative testing methods being approved in this action or in prior expedited approval actions. The new methods are listed along with other methods similarly approved through previous expedited actions in 40 CFR part 141, appendix A to subpart C and on EPA's drinking water methods website at https://www.epa.gov/dwanalyticalmethods.

B. What is the Basis for This Action?

When EPA determines that an alternative analytical method is "equally effective" (i.e., as

effective as a method that has already been promulgated in the regulations), SDWA allows EPA to approve the use of the alternative testing method through publication in the Federal Register (see section 1401(1) of SDWA). EPA is using this streamlined approval authority to make 17 additional methods available for determining contaminant concentrations in drinking water samples collected under SDWA. EPA has determined that, for each contaminant or group of contaminants listed in Section III, the additional testing methods being approved in this action are as effective as one or more of the testing methods already approved in the regulations for those contaminants. Section 1401(1) of SDWA states that the newly approved methods "shall be treated as an alternative for public water systems to the quality control and testing procedures listed in the regulation." Accordingly, this action makes these additional 17 analytical methods legally available as options for meeting EPA's monitoring requirements.

This action does not add regulatory language, but does, for informational purposes, update an appendix to the regulations at 40 CFR Part 141 that lists all methods approved under section 1401(1) of SDWA. Accordingly, while this action is not a rule, it is updating CFR text and therefore is being published in the "Final Rules" section of the Federal Register.

III. Summary of Approvals

EPA is approving 17 methods that are equally effective relative to methods previously promulgated in the regulations. By means of this action, these 17 methods are added to appendix A to subpart C of 40 CFR part 141.

A. Methods developed by EPA

1. EPA Method 150.3, Determination of pH in Drinking Water (USEPA 2017). EPA Method 150.3 was developed in response to comments from state regulators and utility operators that EPA Methods 150.1 (USEPA 1983a) and 150.2 (USEPA 1983b), currently approved at 40

CFR 141.23(k)(1) for standalone and continuous online pH monitoring, respectively, do not address the current pH technologies available for pH monitoring in drinking water utilities. Specifically, the stakeholders requested that a new method address the different types of pH analyzers and require calibration frequency, calibration verification, sampling, and other analytical aspects to assure that the procedure is robust and applicable to the monitoring configurations that exist in drinking water public utilities.

EPA Method 150.3 allows the use of bench-top, portable and continuous monitoring pH meters including newer sensor technologies that are designed for the analysis of pH (e.g., solid state ion selective field effect transistors (ISFETs)), provided that the required quality control (QC) acceptance criteria defined in the method can be met. The calibration procedure in the older continuous monitoring EPA Method 150.2 does not distinguish between pH electrodes that can be easily removed from the process stream and electrodes that cannot be easily removed. The new method simplifies the calibration of continuous monitoring pH meters through the use of either direct or indirect (grab sample) calibration techniques. EPA Method 150.3 defines the frequencies for calibration and calibration verifications and the required measurement acceptance criteria. In addition, the method incorporates guidelines to assist operators with potential problems such as the effect of temperature on pH measurement.

EPA has determined that EPA Method 150.3 is equally effective for measuring pH, relative to EPA Methods 150.1 and 150.2. The basis for this determination is discussed in Adams (2017a). EPA is therefore approving use of EPA Method 150.3 for standalone and continuous online pH monitoring of drinking water. Available at the National Service Center for Environmental Publications (www.epa.gov/nscep).

B. *Methods developed by Voluntary Consensus Standard Bodies (VCSB)*

1. Standard Methods for the Examination of Water and Wastewater (Standard Methods). In 2007, the GA method (GA 2004) for determination of radium-226 and radium-228 by gamma spectrometry was approved in the drinking water regulations at 40 CFR 141.25(a). The method had undergone evaluation through the drinking water Alternate Test Procedure (ATP) program and was examined for acceptability through a multi-laboratory validation study. The validation study assessed system background, sensitivity, precision and accuracy for drinking water samples drawn from multiple sources around the United States. Standard Method 7500-Ra E published in the 22nd edition (APHA 2012) and its identical online version, 7500-Ra E-07 (APHA 2007) were developed directly from the GA gamma spectrometry method, and thus entail the same sample collection and handling protocols, sample preparation, detection procedure, and method performance data.

EPA has determined that Standard Methods 7500-Ra E and 7500-Ra E-07 are equally effective, relative to the approved GA method. The basis for this determination is discussed in Smith (2017a). EPA is therefore approving Standard Methods 7500-Ra E and 7500-Ra E-07 method for determining radium-226 and radium-228 in drinking water by gamma spectrometry.

An additional new online Standard Method 7110 D-17 (APHA 2017) was submitted for evaluation as an alternative to the approved EPA Method 900.0 (USEPA 1980) for the analysis of gross alpha and gross beta activity in drinking water. Standard Method 7110 D-17 involves the simultaneous analysis of gross alpha and gross beta activities by liquid scintillation counting using alpha/beta discrimination.

EPA Method 900.0 was promulgated in the drinking water regulations at 40 CFR 141.25(a) as a screening method to determine whether specific radionuclide analyses are required. While technically simple to perform, the accuracy of the results obtained with EPA

Method 900.0 can be affected by the radionuclides used for calibration, variability in the drinking water dissolved solids, and the sample geometry. Sample self-absorption occurs when radioactive emissions interact with the solid film of residue, which results from evaporating the drinking water samples to dryness. This significantly limits the level of dissolved solids that can be tolerated.

In the liquid scintillation method, self-absorption does not occur as long as solids are dissolved and homogeneously mixed with the scintillation cocktail. The performance of Standard Method 7110 D-17 was evaluated through a multi-laboratory study that assessed the sensitivity, background, accuracy and precision in drinking water matrices containing variable dissolved solids levels. EPA has determined that Standard Method 7110 D-17 is equally as effective for gross alpha and gross beta measurement as the approved EPA Method 900.0. The basis for this determination is discussed in Smith and Wendelken (2017). EPA is therefore approving the use of Standard Method 7110 D-17 for gross alpha and gross beta determination in drinking water.

The online version is available at http://www.standardmethods.org.

2. ASTM International. EPA compared the most recent versions of seven ASTM International methods to the earlier versions of those methods that are currently approved in 40 CFR part 141. The new versions included changes such as:

- Additional sample handling and preservation instructions to assure safety of field samplers (D 2972-15 B, C; D 3559-15 D; D 3645-15 B; and D 3859-15 A, B)
- Additional quality control (D 2972-15 B, C; D 3559-15 D; D 3645-15 B; D 3859-15 A, B; and D 6508-15)

Changes between the earlier approved version and the most recent version of each method are described more fully in Smith (2017b). The additional revisions involve editorial

changes (e.g., updated references, definitions, terminology, procedural clarifications, and reorganization of text). The revised methods are the same as the approved versions with respect to sample collection and handling protocols, sample preparation, analytical methodology, and method performance data; thus, EPA finds they are equally effective relative to the approved methods.

EPA is thus approving the use of the following ASTM methods for the contaminants and their respective regulations listed in the following table:

ASTM Revised Version	Approved Method	Contaminant	Regulation
D 2972-15 B (ASTM 2015a)	D 2972-03 B (ASTM 2003a)	Arsenic	40 CFR 141.23(k)(1)
D 2972-15 C (ASTM 2015a)	D 2972-03 C (ASTM 2003a)	Arsenic	40 CFR 141.23(k)(1)
D 3559-15 D (ASTM 2015b)	D 3559-03 D (ASTM 2003b)	Lead	40 CFR 141.23(k)(1)
D 3645-15 B (ASTM 2015c)	D 3645-03 B (ASTM 2003c)	Beryllium	40 CFR 141.23(k)(1)
D 3859-15 A (ASTM 2015d)	D 3859-03 A (ASTM 2003d)	Selenium	40 CFR 141.23(k)(1)
D 3859-15 B (ASTM 2015d)	D 3859-03 B (ASTM 2003d)	Selenium	40 CFR 141.23(k)(1)
D 6508-15 (ASTM 2015e)	D 6508-00 (ASTM 2000)	Nitrate, Nitrite, Orthophosphate	40 CFR 141.23(k)(1)

An additional ASTM Method D 7283-17 (ASTM 2017) was submitted for evaluation as an alternate test method to the approved EPA Method 900.0 (USEPA 1980) for the analysis of gross alpha and gross beta activity in drinking water. ASTM Method D 7283-17 involves the simultaneous analysis of gross alpha and gross beta activities by liquid scintillation counting using alpha/beta discrimination.

EPA Method 900.0 was promulgated in the drinking water regulations at 40 CFR 141.25(a) as a screening method to determine whether specific radionuclide analyses are

required. While technically simple to perform, the accuracy of the results obtained with EPA Method 900.0 can be affected by the radionuclides used for calibration, variability in the drinking water dissolved solids, and the sample geometry. Sample self-absorption occurs when radioactive emissions interact with the solid film of residue, which results from evaporating drinking water samples to dryness. This significantly limits the level of dissolved solids that can be tolerated.

In the liquid scintillation method, self-absorption does not occur as long as solids are dissolved and homogeneously mixed with the scintillation cocktail. The performance of ASTM Method D 7283-17 was evaluated through a multi-laboratory study that assessed the sensitivity, background, accuracy and precision in drinking water matrices containing variable dissolved solids levels. EPA has determined that ASTM Method D 7283-17 is equally as effective for gross alpha and gross beta measurement as the approved EPA Method 900.0. The basis for this determination is discussed in Smith and Wendelken (2017). EPA is therefore approving the use of ASTM D 7283-17 for gross alpha and gross beta determination in drinking water.

The ASTM methods are available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or http://www.astm.org.

C. *Methods Developed by Vendors*

1. Pathogen Detection Systems, Inc., "TECTA™ EC/TC Medium and the TECTA™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water, March 20, 2017, Version 2.0" (Pathogen Detection Systems, Inc., 2017). Tecta™ EC/TC is a microbiological method for the simultaneous detection of total coliforms and E. coli in drinking water. This method detects the presence/absence of total coliforms and E. coli in 100 mL samples of drinking water by enzymatic cleavage of fluorogenic

compounds, which then yield a fluorescent response. The TECTA™ TC/EC method uses an automated instrument for incubation and detection of total coliforms and E. coli. Approved drinking water methods for total coliforms are listed at 40 CFR 141.852(a)(5) under the Revisions to the Total Coliform Rule (RTCR). Methods approved for E. coli in drinking water are listed at 40 CFR 141.402(c)(2) under the Ground Water Rule (GWR), and at 40 CFR 141.852(a)(5) under the RTCR. TECTA™ EC/TC ("TECTA™ EC/TC Medium and the TECTA™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E.coli) in Drinking Water, May 22, 2014, Version 1.0" (Pathogen Detection Systems, Inc., 2014)) was approved as being equally effective relative to the approved Standard Method 9221 B for total coliforms under the Total Coliform Rule (TCR) and RTCR, and Standard Method 9221 F for E. coli under the TCR, GWR, and RTCR in the June 19, 2014, expedited methods approval action (USEPA 2014). This action is approving a modified version of this method. For the latest version of this method, modifications were made to the TECTA B16 unit. System mass was reduced by using reconfigured heating blocks; components were simplified; and underutilized features were eliminated. These modifications are described in the docket document "Summary of Hardware and Software Modifications TECTA B16 Rev 1.0 versus TECTA B16 Rev 2.0 November 12, 2015" (Pathogen Detection Systems, Inc., 2015). The modifications made for this method did not include any changes to the detection algorithm. EPA reviewed the changes that were made and determined that the modifications did not affect the performance of the method. Therefore, EPA has determined that the TECTA EC/TC Version 2.0 method is equally as effective as the approved TECTA EC/TC Version 1.0 method. A more detailed description of the basis for this determination is discussed in Sinclair (2017). Accordingly, EPA is approving this revised method "TECTA™ EC/TC Medium and the

TECTA™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water, March 20, 2017, Version 2.0" for the determination of total coliforms and E. coli in drinking water. TECTA EC/TC is an automated and self-contained method, but is subject to the requirements for certified laboratories described in 40 CFR 141.28. A copy of the TECTA EC/TC method is available from Pathogen Detection Systems, Inc., 382 King Street East, Kingston, Ontario, Canada, K7K 2Y2.

2. Thermo Fisher Method 557.1 – Determination of Haloacetic Acids in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection (Thermo Fisher 2017a). Thermo Fisher Method 557.1 is a method for the determination of haloacetic acids (HAAs) in drinking water using a multiple cut, two-dimensional ion chromatography (IC) technology that separates the HAAs from matrix interferences in the first dimension, followed by resolution of the HAAs on a small-bore column in the second dimension. Detection and quantitation in the second dimension are accomplished by suppressed conductivity measurement.

The sum of five HAAs (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid) is regulated as "HAA5." The approved methods for HAA5 are listed at 40 CFR 141.131(b)(1). The performance of Thermo Fisher Method 557.1 for each of the five regulated HAAs was compared to the performance criteria established in the approved EPA Methods 552.2 (USEPA 1995) and 552.3, Revision 1.0 (USEPA 2003) for the same compounds. Performance was demonstrated in a variety of drinking water samples derived from both surface and ground water sources. Successful matrix elimination in the first dimension was demonstrated by analysis of high ionic strength matrices containing common anions in drinking water such as chloride, sulfate, bicarbonate and nitrate. Performance results are summarized in the method validation summary report (Thermo Fisher 2017b). EPA has

determined that Thermo Fisher Method 557.1 is equally effective for measuring HAA5 relative to the approved EPA Methods 552.2 and 552.3. The basis for this determination is discussed in Smith (2017c). Therefore, EPA is approving Thermo Fisher Method 557.1 for determining HAA5 in drinking water. A copy of the method is available from Thermo Fisher Scientific, 490 Lakeside Dr., Sunnyvale, CA 94085 (Richard.jack@thermofisher.com).

3. Tintometer Lovibond PTV 1000 Method – Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 1000 White Light LED Turbidimeter (Tintometer 2016a). The Tintometer Lovibond PTV 1000 Method uses light emitting diode (LED) nephelometry to continuously measure turbidity in drinking water. The LED emits white light in the visible spectrum between 380 nm and 780 nm, with spectral peak response between 400 nm and 600 nm. The method is based on a comparison of the intensity of light scattered by a drinking water sample under defined conditions with the intensity of light scattered by a standard reference suspension. The PTV 1000 turbidimeter incorporates a sample deaerator to remove air bubbles and uses heated optics to prevent condensation.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond PTV 1000 Method were compared to the performance characteristics of the approved Hach Filter Trak Method 10133 (Hach Company 2000). The validation study report (Tintometer 2016b) summarizes the results obtained from the turbidimeters placed online at three different utilities. Each utility used surface water sources, but different treatment technologies. Sampling was important to ensure representative tracking and response times between the turbidimeters. The sample stream flowed to a manifold that split it into equal streams, with one stream leading to each instrument in the study.

EPA has determined that the Lovibond PTV 1000 Method is equally effective relative to

Hach Filter Trak Method 10133. The basis for this determination is discussed in Adams (2017b). Therefore, EPA is approving the Lovibond PTV 1000 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243 (http://lovibond.com/ptv1000/).

4. Tintometer Lovibond PTV 2000 Method – Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter (Tintometer 2016c). The Tintometer Lovibond PTV 2000 Method uses light emitting diode (LED) nephelometry to continuously measure turbidity in drinking water. The 660 nm LED has a peak emitting wavelength between 650 nm and 670 nm. Use of a 660 nm LED source reduces interferences due to dissolved organics and sample color. The method is based on a comparison of the intensity of light scattered by a drinking water sample under defined conditions with the intensity of light scattered by a standard reference suspension. The PTV 2000 turbidimeter incorporates a sample deaerator to remove air bubbles and uses heated optics to prevent condensation.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond PTV 2000 Method were compared to the performance characteristics of the approved Hach Filter Trak Method 10133 (Hach Company 2000). The validation study report (Tintometer 2016b) summarizes the results obtained from the turbidimeters placed online at three different utilities. Each utility used surface water sources, but different treatment technologies. Sampling was important to ensure representative tracking and response times between the turbidimeters. The sample stream flowed to a manifold that split it into equal streams, with one stream leading to each instrument in the study.

EPA has determined that the Lovibond PTV 2000 Method is equally effective relative to Hach Filter Trak Method 10133. The basis for this determination is discussed in Adams (2017c).

Therefore, EPA is approving the Lovibond PTV 2000 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243 (http://lovibond.com/ptv1000/).

5. Tintometer Lovibond PTV 6000 Method – Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter (Tintometer 2016d). The Tintometer Lovibond PTV 6000 Method uses laser nephelometry to continuously measure turbidity in drinking water. The method uses a 685 nm laser diode with a peak emitting center wavelength between 650 nm and 690 nm. The incident laser light is a highly collimated beam of high energy light and its small diameter reduces stray light interference, resulting in improved method sensitivity. The method is based on a comparison of the intensity of light scattered by a drinking water sample under defined conditions with the intensity of light scattered by a standard reference suspension. The PTV 6000 turbidimeter incorporates a sample deaerator to remove air bubbles and uses heated optics to prevent condensation.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond PTV 6000 Method were compared to the performance characteristics of the approved Hach Filter Trak Method 10133 (Hach Company 2000). The validation study report (Tintometer 2016b) summarizes the results obtained from the turbidimeters placed online at three different utilities. Each utility used surface water sources, but different treatment technologies. Sampling was important to ensure representative tracking and response times between the turbidimeters. The sample stream flowed to a manifold that split it into equal streams, with one stream leading to each instrument in the study.

EPA has determined that the Lovibond PTV 6000 Method is equally effective relative to Hach Filter Trak Method 10133. The basis for this determination is discussed in Adams (2017d).

Therefore, EPA is approving the Lovibond PTV 6000 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243 (http://lovibond.com/ptv1000/).

IV. Statutory and Executive Order Reviews

As noted in Section II, under the terms of SDWA section 1401(1), this streamlined method approval action is not a rule. Accordingly, the Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, does not apply because this action is not a rule for purposes of 5 U.S.C. 804(3). Similarly, this action is not subject to the Regulatory Flexibility Act because it is not subject to notice and comment requirements under the Administrative Procedure Act or any other statute. In addition, because this approval action is not a rule, but simply makes alternative testing methods available as options for monitoring under SDWA, EPA has concluded that other statutes and executive orders generally applicable to rulemaking do not apply to this approval action.

V. References

Adams, W. 2017a. Memo to the record describing basis for expedited approval of EPA Method 150.3 for determination of pH. February 2017. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

Adams, W. 2017b. Memo to the record describing basis for expedited approval of Tintometer method for continuous measurement of drinking water turbidity using a Lovibond PTV 1000 white light LED turbidimeter. January 2017. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

Adams, W. 2017c. Memo to the record describing basis for expedited approval of Tintometer method for continuous measurement of drinking water turbidity using a Lovibond PTV

2000 660 nm LED turbidimeter. January 2017. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

Adams, W. 2017d. Memo to the record describing basis for expedited approval of Tintometer method for continuous measurement of drinking water turbidity using a Lovibond PTV 6000 laser turbidimeter. January 2017. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

American Public Health Association (APHA). 2007. Standard Method 7500-Ra E-07, Radium – Gamma Spectroscopy Method. Approved by Standard Methods Committee 2007. Standard Methods Online (Available at http://www.standardmethods.org)

American Public Health Association (APHA). 2012. 22nd Edition of Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

American Public Health Association (APHA). 2017. Standard Method 7110 D-17. Liquid Scintillation Spectroscopic Method for Gross Alpha-Beta. Approved by Standard Methods Committee 2017. Standard Methods Online (Available at http://www.standardmethods.org)

ASTM International. 2000. ASTM D 6508-00. Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2003a. ASTM D 2972-03 B, C. Standard Test Methods for Arsenic in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2003b. ASTM D 3559-03 D. Standard Test Methods for Lead in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2003c. ASTM D 3645-03 B. Standard Test Methods for Beryllium in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2003d. ASTM D 3859-03 A, B. Standard Test Methods for Selenium in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2015a. ASTM D 2972-15 B, C. Standard Test Methods for Arsenic in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2015b. ASTM D 3559-15 D. Standard Test Methods for Lead in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2015c. ASTM D 3645-15 B. Standard Test Methods for Beryllium in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2015d. ASTM D 3859-15 A, B. Standard Test Methods for Selenium in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2015e. ASTM D 6508-15. Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis

and Chromate Electrolyte. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

ASTM International. 2017. Standard Test Method for Alpha and Beta Activity in Water by Liquid Scintillation Counting. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at http://www.astm.org.)

GA. 2004. Method for the Determination of Radium-228 and Radium-226 in Drinking Water by Gamma-ray Spectrometry using HPGE or Ge(Li) Detectors. December 2004. Revision 1.2. Environmental Resource Center, Georgia Institute for Technology, 620 Cherry Street, Atlanta, Georgia 30332-0335. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

Hach Company. 2000. Hach FilterTrak Method 10133 - Determination of Turbidity by Laser Nephelometry. January 2000. Revision 2.0. 5600 Lindbergh Drive, Loveland, Colorado 80539. (Available at http://www.hach.com.)

Pathogen Detection Systems, Inc. 2014. TECTA™ EC/TC Medium and the TECTA™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water. May 22, 2014. Version 1.0. Pathogen Detection Systems, Inc. 382 King Street East, Kingston, Ontario, Canada K7K 2Y2. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

Pathogen Detection Systems, Inc. 2015. Summary of hardware and software modifications, TECTA B16 Rev. 1.0 versus TECTA B16 Rev. 2.0, November 12, 2015. Pathogen Detection Systems, Inc. 382 King Street East, Kingston, Ontario, Canada K7K 2Y2. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2017-0284.)

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List of Subjects in 40 CFR Part 141

Environmental protection, Chemicals, Indians-lands, Intergovernmental relations, Reporting and recordkeeping requirements, Water supply.

Dated: July 5, 2017.

Peter Grevatt,
Director, Office of Ground Water and Drinking Water.

For the reasons stated in the preamble, the Environmental Protection Agency amends 40 CFR part 141 as follows:

PART 141 - NATIONAL PRIMARY DRINKING WATER REGULATIONS

1. The authority citation for part 141 continues to read as follows:

Authority: 42 U.S.C. 300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, and 300j-11**.**

2. Appendix A to subpart C of part 141 is amended as follows:

a. By revising the entries for "Arsenic," "Beryllium," "Lead,", "Nitrate," "Nitrite," "Orthophosphate," "pH," and "Selenium" in the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.23(k)(1)."

b. By revising the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.25(a)."

c. By revising the entry for "Turbidity" in the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.74(a)(1)."

d. By revising the entry for "HAA5" in the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.131(b)(1)."

e. By revising the entry for "E. coli" in the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.402(c)(2)."

f. By revising the entries for "Total Coliforms" and "Escherichia coli" in the table entitled "ALTERNATE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.852(a)(5)."

g. By revising footnote 33.

h. By adding footnotes 43 through 48.

The revisions and additions read as follows:

APPENDIX A TO SUBPART C OF PART 141 - ALTERNATIVE TESTING METHODS APPROVED FOR ANALYSES UNDER THE SAFE DRINKING WATER ACT

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ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.23 (k)(1)

Contaminant	Methodology	EPA Method	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	ASTM [4]	Other
* * * * * * *							
Arsenic	Atomic Absorption; Furnace		3113 B	3113 B	3113 B-04, B-10	D 2972-08 C, -15 C	
	Hydride Atomic Absorption		3114 B	3114 B	3114 B-09	D 2972-08 B, -15 B	
	Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP–AES)	200.5, Revision 4.2 [2]					
* * * * * * *							
Beryllium	Inductively Coupled Plasma		3120 B	3120 B			
	Atomic Absorption; Furnace		3113 B	3113 B	3113 B-04, B-10	D 3645-08 B, -15 B	
	Axially viewed inductively coupled plasma-atomic	200.5, Revision 4.2 [2]					

Contaminant	Methodology	EPA Method	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	ASTM [4]	Other
	emission spectrometry (AVICP–AES)						
* * * * * * *							
Lead	Atomic Absorption; Furnace		3113 B	3113 B	3113 B-04, B-10	D 3559-08 D, -15 D	
	Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP–AES)	200.5, Revision 4.2 [2]					
* * * * * * *							
Nitrate	Ion Chromatography		4110 B	4110 B		D 4327-11	
	Automated Cadmium Reduction		4500-NO_3^- F	4500-NO_3^- F			
	Manual Cadmium Reduction		4500-NO_3^- E	4500-NO_3^- E			
	Ion Selective Electrode		4500-NO_3^- D	4500-NO_3^- D			
	Reduction/Colorimetric						Systea Easy (1-Reagent) [8] NECi Nitrate-Reductase. [40]
	Colorimetric; Direct						Hach TNTplus™ 835/836 Method 10206. [23]
	Capillary Ion					D 6508-15	

Contaminant	Methodology	EPA Method	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	ASTM [4]	Other
	Electrophoresis						
Nitrite	Ion Chromatography		4110 B	4110 B		D 4327-11	
	Automated Cadmium Reduction		4500-NO_3^- F	4500-NO_3^- F			
	Manual Cadmium Reduction		4500-NO_3^- E	4500-NO_3^- E			
	Spectrophotometric		4500-NO_2^- B	4500-NO_2^- B			
	Reduction/Colorimetric						Systea Easy (1-Reagent) [8] NECi Nitrate-Reductase. [40]
	Capillary Ion Electrophoresis					D 6508-15	
Orthophosphate	Ion Chromatography		4110 B	4110 B		D 4327-11	
	Colorimetric, ascorbic acid, single reagent		4500-P E	4500-P E	4500-P E-99		
	Colorimetric, Automated, Ascorbic Acid		4500-P F	4500-P F	4500-P F-99		Thermo Fisher Discrete Analyzer. [41]
	Capillary Ion Electrophoresis					D 6508-15	
pH	Electrometric	150.3[48]	4500-H^+ B	4500-H^+ B		D 1293-12	
Selenium	Hydride-Atomic Absorption		3114 B	3114 B	3114 B-09	D 3859-08 A, -15 A	
	Atomic Absorption;		3113 B	3113 B	3113 B-04,	D 3859-08	

Contaminant	Methodology	EPA Method	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	ASTM [4]	Other
	Furnace				B-10	B, -15 B	
	Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP–AES)	200.5, Revision 4.2 [2]					
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ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.25(a)

Contaminant	Methodology	SM 21st Edition [1]	SM 22nd Edition [28]	ASTM [4]	SM Online [3]
Naturally Occurring:					
Gross alpha and beta	Evaporation	7110 B	7110 B		
	Liquid Scintillation			D 7283-17	7110 D-17
Gross alpha	Coprecipitation	7110 C	7110 C		
Radium 226	Radon emanation	7500-Ra C	7500-Ra C	D 3454-05	
	Radiochemical	7500-Ra B	7500-Ra B	D 2460-07	
	Gamma Spectrometry		7500-Ra E		7500-Ra E-07
Radium 228	Radiochemical	7500-Ra D	7500-Ra D		
	Gamma Spectrometry		7500-Ra E		7500-Ra E-07

Contaminant	Methodology	SM 21st Edition [1]	SM 22nd Edition [28]	ASTM [4]	SM Online [3]
Uranium	Radiochemical	7500-U B	7500-U B		
	ICP-MS	3125		D 5673-05, 10	
	Alpha spectrometry	7500-U C	7500-U C	D 3972-09	
	Laser Phosphorimetry			D 5174-07	
	Alpha Liquid Scintillation Spectrometry			D 6239-09	
Man-Made:					
Radioactive Cesium	Radiochemical	7500-Cs B	7500-Cs B		
	Gamma Ray Spectrometry	7120	7120	D 3649-06	
Radioactive Iodine	Radiochemical	7500-I B 7500-I C 7500-I D	7500-I B 7500-I C 7500-I D	D 3649-06	
	Gamma Ray Spectrometry	7120	7120	D 4785-08	
Radioactive Strontium 89, 90	Radiochemical	7500-Sr B	7500-Sr B		
Tritium	Liquid Scintillation	7500-^{3}H B	7500-^{3}H B	D 4107-08	
Gamma Emitters	Gamma Ray Spectrometry	7120 7500-Cs B 7500-I B	7120 7500-Cs B 7500-I B	D 3649-06 D 4785-08	

ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.74(a)(1)

Organism	Methodology	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	Other
* * * * * * *					
Turbidity	Nephelometric Method	2130 B	2130 B		

Organism	Methodology	SM 21st Edition [1]	SM 22nd Edition [28]	SM Online [3]	Other
	Laser Nephelometry (online)				Mitchell M5271. [10] Mitchell M5331, Rev. 1.2. [42] Lovibond PTV 6000. [46]
	LED Nephelometry (online)				Mitchell M5331 [11] Mitchell M5331, Rev. 1.2. [42] Lovibond PTV 2000. [45]
	LED Nephelometry (online)				AMI Turbiwell. [15] Lovibond PTV 1000. [44]
	LED Nephelometry (portable)				Orion AQ4500.[12]
	360° Nephelometry				Hach Method 10258. [39]

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ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.131(b)(1)

Contaminant	Methodology	EPA Method	ASTM [4]	SM Online [3]	SM 21st Edition [1]	SM 22nd Edition [28]	Other
* * * * * * *							
HAA5	LLE (diazomethane)/GC/ECD			6251 B-07	6251 B	6251 B	
	Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)	557 [14]					
	Two-Dimensional Ion Chromatography (IC) with Suppressed Conductivity Detection						Thermo Fisher 557.1. [47]

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ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.402(c)(2)

Organism	Methodology	SM 20th Edition [6]	SM 21st Edition[1]	SM 22nd Edition [28]	SM Online [3]	Other
E. coli	Colilert®		9223 B	9223 B	9223 B-97, B-04	
	Colisure®		9223 B	9223 B	9223 B-97, B-04	
	Colilert-18	9223 B	9223 B	9223 B	9223 B-97, B-04	
	Readycult®					Readycult® [20]
	Colitag					Modified Colitag™ [13]
	Chromocult®					Chromocult® [21]
	EC-MUG			9221 F	9221 F-06	
	Tecta EC/TC [33, 43]					
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ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.852(a)(5)

Organism	Methodology Category	Method	SM 20th, 21st Editions [1,6]	SM 22nd Edition [28]	SM Online [3]
Total Coliforms	Lactose Fermentation Methods	Standard Total Coliform Fermentation Technique		9221 B.1, B.2	9221 B.1, B.2-06
	Enzyme Substrate Methods	Colilert®		9223 B	9223 B-04
		Colisure®		9223 B	9223 B-04
		Colilert-18	9223 B	9223 B	9223 B-04
		Tecta EC/TC [33, 43]			
Escherichia coli	*Escherichia coli*	EC-MUG medium		9221 F.1	9221 F.1-06

	Procedure (following Lactose Fermentation Methods)				
	Enzyme Substrate Methods	Colilert®		9223 B	9223 B-04
		Colisure®		9223 B	9223 B-04
		Colilert-18	9223 B	9223 B	9223 B-04
		Tecta EC/TC [33, 43]			

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[1] Standard Methods for the Examination of Water and Wastewater, 21st edition (2005). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

[2] EPA Method 200.5, Revision 4.2. "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry." 2003. EPA/600/R-06/115. (Available at http://www.epa.gov/water-research/epa-drinking-water-research-methods.)

[3] Standard Methods Online are available at http://www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

[4] Available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or http://astm.org. The methods listed are the only alternative versions that may be used.

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[6] Standard Methods for the Examination of Water and Wastewater, 20th edition (1998). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

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[8] Systea Easy (1-Reagent). "Systea Easy (1-Reagent) Nitrate Method," February 4, 2009. Available at https://www.nemi.gov or from Systea Scientific, LLC., 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523.

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[10] Mitchell Method M5271, Revision 1.1. "Determination of Turbidity by Laser Nephelometry," March 5, 2009. Available at https://www.nemi.gov or from Leck Mitchell, Ph.D., PE, 656 Independence Valley Dr., Grand Junction, CO 81507.

[11] Mitchell Method M5331, Revision 1.1. "Determination of Turbidity by LED Nephelometry," March 5, 2009. Available at https://www.nemi.gov or from Leck Mitchell, Ph.D., PE, 656 Independence Valley Dr., Grand Junction, CO 81507.

[12] Orion Method AQ4500, Revision 1.0. "Determination of Turbidity by LED Nephelometry," May 8, 2009. Available at https://www.nemi.gov or from Thermo Scientific, 166 Cummings Center, Beverly, MA 01915, http://www.thermo.com.

[13] Modified Colitag™ Method. "Modified Colitag™ Test Method for the Simultaneous Detection of *E. coli* and other Total Coliforms in Water (ATP D05-0035)," August 28, 2009. Available at https://www.nemi.gov or from CPI International, 5580 Skylane Boulevard, Santa Rosa, CA 95403.

[14] EPA Method 557. "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)," September 2009. EPA 815-B-09-012. Available at the National Service Center for Environmental Publications (www.epa.gov/nscep). Search "815B09012".

[15] AMI Turbiwell, "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter," August 2009. Available at https://www.nemi.gov or from Markus Bernasconi, SWAN Analytische Instrumente AG, Studbachstrasse 13, CH-8340 Hinwil, Switzerland.

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[20] Readycult® Method, "Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters," January, 2007. Version 1.1. Available from EMD Millipore (division of Merck KGaA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821.

[21] Chromocult® Method, "Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters," November, 2000. Version 1.0. EMD Millipore (division of Merck KGaA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821.

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[23] Hach Company. "Hach Company TNTplus™ 835/836 Nitrate Method 10206 – Spectrophotometric Measurement of Nitrate in Water and Wastewater," January 2011. 5600 Lindbergh Drive, P.O. Box 389, Loveland, Colorado 80539. (Available at http://www.hach.com.)

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[28] Standard Methods for the Examination of Water and Wastewater, 22nd edition (2012). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

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[33] Tecta EC/TC. "Techta™ EC/TC Medium and Techta™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water," version 1.0, May 2014. Available from Pathogen Detection Systems, Inc., 382 King Street East, Kingston, Ontario, Canada, K7K 2Y2.

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[39] Hach Company. "Hach Method 10258 – Determination of Turbidity by 360° Nephelometry," January 2016. 5600 Lindbergh Drive, P.O. Box 389, Loveland, CO 80539. (Available at http://www.hach.com.)

[40] Nitrate Elimination Company Inc. (NECi). "Method for Nitrate Reductase Nitrate-Nitrogen Analysis of Drinking Water," February 2016. Superior Enzymes Inc., 334 Hecla Street, Lake Linden, Michigan 49945.

[41] Thermo Fisher. "Thermo Fisher Scientific Drinking Water Orthophosphate Method for Thermo Scientific Gallery Discrete Analyzer," February 2016. Revision 5. Thermo Fisher Scientific, Ratastie 2, 01620 Vantaa, Finland.

[42] Mitchell Method M5331, Revision 1.2. "Determination of Turbidity by LED or Laser Nephelometry," February 2016. Available from Leck Mitchell, Ph.D., PE, 656 Independence Valley Dr., Grand Junction, CO 81507.

[43] Tecta EC/TC. "Tecta™ EC/TC Medium and the Tecta™ Instrument: A Presence/Absence Method for the Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water," version 2.0, February 2017. Available from Pathogen Detection Systems, Inc., 382 King Street East, Kingston, Ontario, Canada, K7K 2Y2.

[44] Lovibond PTV 1000. "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 1000 White Light LED Turbidimeter," December 2016. Revision 1.0. Available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243.

[45] Lovibond PTV 2000. "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter," December 2016. Revision 1.0. Available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243.

[46] Lovibond PTV 6000. "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter," December 2016. Revision 1.0. Available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243.

[47] Thermo Fisher. "Thermo Fisher Method 557.1: Determination of Haloacetic Acids in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection," January 2017. Version 1.0. Available from Thermo Fisher Scientific, 490 Lakeside Dr., Sunnyvale, CA 94085 (Richard.jack@thermofisher.com).

[48] EPA Method 150.3. "Determination of pH in Drinking Water," February 2017. EPA 815-B-17-001. Available at the National Service Center for Environmental Publications (www.epa.gov/nscep).

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