6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 141

[EPA-HQ-OW-2022-0407; FRL-9834-01-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 Environmental Protection Agency's (EPA's) approval of alternative testing methods for use in measuring the levels of contaminants in drinking water to determine 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 seven 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: EPA has established a docket for this action under Docket ID No. EPA-HQ-OW-2022-0407. All documents in the docket are listed on the https://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 https://www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: 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. 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

CFR: *Code of Federal Regulations*

EPA: United States Environmental Protection Agency

LED: Light emitting diode

NAICS: North American Industry Classification System

QC: Quality Control

SDWA: The Safe Drinking Water Act

VCSB: Voluntary Consensus Standard Bodies

II. Background

A. What is the Purpose of This Action?

In this action, EPA is approving seven analytical methods for determining contaminant concentrations in drinking water samples collected under SDWA. Regulated entities 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 seven 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 of this preamble, 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 seven 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 seven methods that are equally effective relative to methods previously promulgated in the regulations. By means of this action, these seven methods are added to appendix A to subpart C of 40 CFR part 141.

A. Methods developed by EPA

1. EPA Method 904.0, Revision 1.0. Radium-228 in Drinking Water (USEPA 2022). EPA Method 904.0 (USEPA 1980) was published in the drinking water regulations at 40 CFR 141.25(a) as an approved method for radium-228. The approved method describes a single-point calibration, contains no quality control specifications, and provides no calculation for the drinking water detection limit. EPA Method 904.0, Revision 1.0 was developed in response to comments from stakeholders requesting a method revision that provides clearly defined

calibration and quality control criteria to assure a more robust procedure capable of yielding consistent and reliable analytical results. The primary analytical steps in Revision 1.0 are unchanged relative to the approved method.

The revised method contains detailed instructions on preparing an appropriate calibration curve based on the allowable yield ranges instead of relying on a single-point calibration. Assessing the efficiency based on a yield range will improve the accuracy in the final calculated activity whereas a single-point calibration assumes that every sample will yield the same mass of solid precipitate.

The revised method contains the quality control specifications that laboratories must follow in order to obtain and maintain Method 904.0, Revision 1.0 certification to analyze drinking water compliance samples. In addition to incorporation of specific quality control requirements and acceptance criteria, the revised method contains options for yield determinations. In EPA Method 904.0, two different yields are monitored based on the precipitated products; namely, radium-228 is separated from the sample by co-precipitation with barium sulfate, then ingrown actinium-228 is separated by co-precipitation with yttrium oxalate. The currently approved method relies on gravimetric determination of the final barium sulfate precipitate to estimate the fractional yield of radium carried on the precipitate. The revised method allows the option to incorporate barium-133 as a radiochemical yield monitor. Barium-133 is a non-interfering gamma emitter that is carried through the precipitation and complexation steps along with radium-228. Incorporation of a radiochemical yield monitor provides a sensitive option to assess yield based on activity instead of mass. The currently approved method also describes preparation of a final yttrium oxalate nonahydrate precipitate to determine the fractional yield of actinium-228 carried on the precipitate. Yttrium oxalate can be precipitated in the form of several different hydrates with the predominate form dependent on the pH. This issue is not discussed in the original method and can increase variability in the yield results. The revised method discusses the importance of pH control and includes the option to convert the

yttrium oxalate nonahydrate to yttrium oxide to eliminate the issue posed by the presence of multiple hydrates.

The revised method contains an expanded "calculations" section that includes the appropriate equation for determining the radionuclide drinking water detection limit as defined in the regulations at 40 CFR 141.25(c).

EPA has determined that EPA Method 904.0, Revision 1.0 is equally effective for determining radium-228 in drinking water samples, relative to the approved method. The basis for this determination is discussed in greater detail in Smith 2022a. Therefore, EPA is approving EPA Method 904.0, Revision 1.0 for determining radium-228 in drinking water. EPA Method 904.0, Revision 1.0 is available at the National Service Center for Environmental Publications at https://www.epa.gov/nscep.

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

1. ASTM International. EPA compared the most recent versions of three ASTM International methods to the earlier versions of those methods that are currently approved in 40 CFR part 141. Changes between the earlier approved version and the most recent version of each method are described more fully in Smith 2022b. The revisions involve primarily 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(s)	Regulation Citations
D 4785-20 (ASTM 2020a)	D 4785-00 (ASTM 2000)	Radioactive iodine, gamma emitters	40 CFR 141.25(a)
D 4107-20 (ASTM 2020b)	D 4107-98 (ASTM 1998a)	Tritium	40 CFR 141.25(a)

D 5317-20 (ASTM 2020c)	D 5317-98 (ASTM 1998b)	2,4-D, Pentachlorophenol, Picloram, 2,4,5-TP	40 CFR 141.24(e)(1)

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

C. *Methods Developed by Vendors*

1. Tintometer Lovibond TB 3500 Method – Measurement of Drinking Water Turbidity of a Captured Sample Using a Lovibond White Light LED Portable Turbidimeter (Tintometer 2021a). The Tintometer Lovibond TB 3500 Method uses white light emitting diode (LED) nephelometry in a portable turbidimeter to 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.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond TB 3500 Method were compared to the performance characteristics of the approved Hach FilterTrak Method 10133 (Hach Company 2000) and continuous online process Tintometer Lovibond PTV 1000 method (Tintometer 2016a). The validation study report (Tintometer 2021b) summarizes the results obtained from the turbidimeters tested at three different utilities. Each utility used surface water sources, but different treatment technologies. Method precision, bias, linearity, limits of detection, and reporting limits were determined at the first site, with subsequent sites being used for direct ATP candidate-, reference-, and process-method comparability.

EPA has determined that the Lovibond TB 3500 Method is equally effective relative to Hach FilterTrak Method 10133. The basis for this determination is discussed in Adams 2022a. Therefore, EPA is approving the Lovibond TB 3500 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive,

Sarasota, FL 34243.

2. Tintometer Lovibond TB 5000 Method – Measurement of Drinking Water Turbidity of a Captured Sample Using a Lovibond 660-nm LED Portable Turbidimeter (Tintometer 2021c). The Tintometer Lovibond TB 5000 Method uses light emitting diode (LED) nephelometry in a portable turbidimeter to measure turbidity in drinking water. The LED emits 660-nm light to reduce 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.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond TB 5000 Method were compared to the performance characteristics of the approved Hach FilterTrak Method 10133 (Hach Company 2000) and continuous online process Tintometer Lovibond PTV 2000 method (Tintometer 2016b). The validation study report (Tintometer 2021b) summarizes the results obtained from the turbidimeters placed online at three different utilities. Each utility used surface water sources, but different treatment technologies. Method precision, bias, linearity, limits of detection, and reporting limits were determined at the first site, with subsequent sites being used for direct ATP candidate-, reference-, and process-method comparability.

EPA has determined that the Lovibond TB 5000 Method is equally effective relative to Hach FilterTrak Method 10133. The basis for this determination is discussed in Adams 2022b. Therefore, EPA is approving the Lovibond TB 5000 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243.

3. Tintometer Lovibond TB 6000 Method – Measurement of Drinking Water Turbidity of a Captured Sample Using a Lovibond Portable Laser Turbidimeter (Tintometer 2021d). The Tintometer Lovibond TB 6000 Method uses laser nephelometry in a portable turbidimeter to measure turbidity in drinking water. The method uses a laser diode with a peak emitting center

wavelength between 650 nm and 690 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.

Approved methods for turbidity are listed at 40 CFR 141.74(a)(1). The performance characteristics of the Lovibond TB 6000 Method were compared to the performance characteristics of the approved Hach FilterTrak Method 10133 (Hach Company 2000) and continuous online process Tintometer Lovibond PTV 6000 method (Tintometer 2016c). The validation study report (Tintometer 2021b) summarizes the results obtained from the turbidimeters placed online at three different utilities. Each utility used surface water sources, but different treatment technologies. Method precision, bias, linearity, limits of detection, and reporting limits were determined at the first site, with subsequent sites being used for direct ATP candidate-, reference-, and process-method comparability.

EPA has determined that the Lovibond TB 6000 Method is equally effective relative to Hach Filter TrakMethod 10133. The basis for this determination is discussed in Adams 2022c. Therefore, EPA is approving the Lovibond TB 6000 Method for determining turbidity in drinking water. A copy of the method is available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243.

IV. Statutory and Executive Order Reviews

As noted in section II of this preamble, 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. 2022a. Memo to the record describing basis for expedited approval of Tintometer Lovibond TB 3500 turbidimeter. February 9, 2022. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Adams, W. 2022b. Memo to the record describing basis for expedited approval of Tintometer Lovibond TB 5000 turbidimeter. February 9, 2022. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Adams, W. 2022c. Memo to the record describing basis for expedited approval of Tintometer Lovibond TB 6000 turbidimeter. February 9, 2022. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

ASTM International. 1998a. ASTM D 4107-98. Standard Test Method for Tritium in Drinking Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959. (Available at https://www.astm.org.)

ASTM International. 1998b. ASTM D 5317-98. Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (Available at https://www.astm.org.)

ASTM International. 2000. ASTM D 4785-00. Standard Test Method for Low-Level Analysis of Iodine Radioisotopes in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (Available at https://www.astm.org.)

ASTM International. 2020a. ASTM D 4785-20. Standard Test Method for Low-Level Analysis of Iodine Radioisotopes in Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (Available at https://www.astm.org.)

ASTM International. 2020b. ASTM D 4107-20. Standard Test Method for Tritium in Drinking Water. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (Available at https://www.astm.org.)

ASTM International. 2020c. ASTM D 5317-20. Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector. ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. (Available at https://www.astm.org.)

Hach Company. 2000. Hach FilterTrak Method 10133. Determination of Turbidity by Laser Nephelometry. January 2000, Revision 2.0. Hach Company, 5600 Lindbergh Drive, Loveland, Colorado 80539. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Smith, G. 2022a. Memo to the record describing basis for expedited approval of EPA Method 904.0, Revision 1.0. January 10, 2022. (Available at http://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Smith, G. 2022b. Memo to the record describing basis for expedited approval of updated methods from ASTM International. January 5, 2022. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2016a. Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV 1000 White Light LED Turbidimeter – The Lovibond White Light Method. December 2016. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2016b. Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV 2000 660-nm LED Turbidimeter – The Lovibond 660-nm LED Method. December 2016. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2016c. Continuous Measurement of Drinking Water Turbidity using a Lovibond PTV

6000 Laser Turbidimeter – The Lovibond 6000 Laser Method. December 2016. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2021a. Lovibond TB 3500: Measurement of a Captured Sample using a Lovibond White Light LED Portable Turbidimeter. May 2021. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2021b. Alternate Test Procedure (ATP) Validation Study Report for the Measurement of Drinking Water Turbidity up to 10 NTU using the Lovibond Portable Turbidimeter Methods. April 26, 2021. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2021c. Lovibond TB 5000: Measurement of Drinking Water Turbidity of a Captured Sample using a Lovibond 660-nm LED Portable Turbidimeter. May 2021. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

Tintometer 2021d. Lovibond TB 6000: Measurement of Drinking Water Turbidity of a Captured Sample using a Lovibond Portable Laser Turbidimeter. May 2021. Revision 1.0. Tintometer, Inc. 6456 Parkland Drive, Sarasota, FL 34243. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

USEPA. 1980. EPA Method 904.0. Radium-228 in Drinking Water in "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA-600/4-80-032, August 1980. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

USEPA. 2022. EPA Method 904.0, Revision 1.0. Radium-228 in Drinking Water. EPA 815-B-22-003. March 2022. (Available at https://www.regulations.gov; docket ID No. EPA-HQ-OW-2022-0407.)

List of Subjects in 40 CFR Part 141

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

Jennifer L. McLain, 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. Amend appendix A to subpart C of Part 141 by:

a. Revise the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.24(e)(1)";

b. In the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.25(a)" revise the entries for "Radium 228," "Radioactive Iodine," "Tritium," and "Gamma Emitters";

c. In the table entitled "ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.74(a)(1)" revise the entry for "Turbidity";

d. Revise footnotes "7", "10", "11", "12", "15", "18", "19", "27", "30", "47", and "50"; and,

e. Add footnotes 62 through 65.

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 141.24 (e)(1)							
Contaminant	**Methodology**	**EPA Method**	**SM 21st Edition[1]**	**SM 22nd Edition [28], SM 23rd Edition [49]**	**SM Online [3]**	**ASTM [4]**	**Other**
Benzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Carbon tetrachloride	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Chlorobenzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,2-Dichlorobenzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,4-Dichlorobenzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,2-Dichloroethane	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
cis-Dichloroethylene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
trans-Dichloroethylene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Dichloromethane	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,2-Dichloropropane	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Ethylbenzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					

Styrene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Tetrachloroethylene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,1,1-Trichloroethane	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Trichloroethylene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Toluene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,2,4-Trichlorobenzene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,1-Dichloroethylene	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
1,1,2-Trichlorethane	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Vinyl chloride	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
Xylenes (total)	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					
2,4-D	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06	D 5317-20	
2,4,5-TP (Silvex)	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06	D 5317-20	
Alachlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					

Atrazine	Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)	536 [25]					
	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24], 523 [26]					
Benzo(a)pyrene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Carbofuran	High-performance liquid chromatography (HPLC) with post-column derivatization and fluorescence detection		6610 B	6610 B	6610 B-04		
	Liquid Chromatography/Mass Spectrometry						ME 531 [58]
Chlordane	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Dalapon	Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)	557 [14]					
	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06		
Di(2-ethylhexyl)adipate	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Di(2-ethylhexyl)phthalate	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Dibromochloropropane (DBCP)	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9]					
Dinoseb	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06		

Endrin	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Ethyl dibromide (EDB)	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9]					
Glyphosate	High-Performance Liquid Chromatography (HPLC) with Post-Column Derivatization and Fluorescence Detection		6651 B	6651 B	6651 B-00, B-05		
Heptachlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Heptachlor Epoxide	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Hexachlorobenzene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Hexachlorocyclo-pentadiene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Lindane	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Methoxychlor	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Oxamyl	High-performance liquid chromatography (HPLC) with post-column derivatization and fluorescence detection		6610 B	6610 B	6610 B-04		
	Liquid Chromatography/Mass Spectrometry						ME 531 [58]
PCBs (as Aroclors)	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					

Pentachlorophenol	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06	D 5317-20	
	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Picloram	Gas Chromatography/Electron Capture Detection (GC/ECD)		6640 B	6640 B	6640 B-01, B-06	D 5317-20	
Simazine	Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)	536 [25]					
	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24], 523 [26]					
Toxaphene	Solid Phase Extraction/Gas Chromatography/Mass Spectrometry (GC/MS)	525.3 [24]					
Total Trihalomethanes	Purge &Trap/Gas Chromatography/Mass Spectrometry	524.3 [9], 524.4 [29]					

ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.25(a)						
Contaminant	**Methodology**	**EPA Method**	**SM 21st Edition [1]**	**SM 22nd Edition [28], SM 23rd Edition [49]**	**ASTM [4]**	**SM Online [3]**
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Radium 228	Radiochemical	904.0, Rev. 1.0 [62]	7500-Ra D	7500-Ra D		
	Gamma Spectrometry			7500-Ra E		7500-Ra E-07
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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, -20	
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Tritium	Liquid Scintillation		7500-^{3}H B	7500-^{3}H B	D 4107-08, -20	
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, -20	

ALTERNATIVE TESTING METHODS FOR CONTAMINANTS LISTED AT 40 CFR 141.74(a)(1)						
ORGANISM	**METHODOLOGY**	**SM 21ST EDITION [1]**	**SM 22nd Edition [28]**	**SM 23rd Edition [49]**	**SM Online [3]**	**Other**
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Turbidity	Nephelometric Method	2130 B	2130 B	2130 B		Hach Method 8195, Rev. 3.0 [52]
	Laser Nephelometry (on-line)					Mitchell M5271 [10] Mitchell M5331, Rev. 1.2 [42] Lovibond PTV 6000 [46]
	LED Nephelometry (on-line)					Mitchell M5331 [11] Mitchell M5331, Rev. 1.2 [42] Lovibond PTV 2000 [45]
	LED Nephelometry (on-line)					AMI Turbiwell [15] Lovibond PTV 1000 [44]
	LED Nephelometry (portable)					Orion AQ4500 [12], Lovibond TB 3500 [64], Lovibond TB 5000 [65]
	Laser Nephelometry (portable)					Lovibond TB 6000 [63]

	360° Nephelometry					Hach Method 10258, Rev. 1.0 [39], Hach Method 10258, Rev. 2.0 [51]

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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.

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[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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