ILLINOIS POLLUTION CONTROL BOARD
December 19, 2019

IN THE MATTER OF:	)	R19-16
SDWA UPDATE, USEPA AMENDMENTS	)	(Identical-in-Substance
(July 1, 2018 through December 31, 2018)	)	Rulemaking - Public Water Supply)

Proposed Rule. Proposal for Public Comment.

OPINION AND ORDER OF THE BOARD (by C.M. Santos):

SUMMARY OF THIS ACTION

The Board today proposes amendments to Illinois regulations that are "identical in substance" (IIS) to drinking water regulations adopted by the United States Environmental Protection Agency (USEPA) in the second half of 2018. USEPA did not amend the federal National Primary Drinking Water Regulations (NPDWRs) during this period, but it granted summary approval to about 100 additional alternative test procedures (ATPs) for analyzing contaminants in drinking water. The Board adds these additional ATPs to the Illinois drinking water monitoring provisions.

The Board adds limited revisions not directly based on the present USEPA approval of new ATPs. The Board finds these revisions are needed. Significant among the Board-initiated revisions are changes in the defined short-form names for analytical methods and reorganization of the incorporations by reference. The Board-initiated revisions include stylistic changes, including many of types ordinarily requested by JCAR, and corrections to errors in the text. Discussion appears below.

Finally, the Board finds that additional time is needed to complete the amendments. The Board extends the due date for final action from October 12, 2019 to March 31, 2020.

Sections 7.2 and 17.5 of the Illinois Environmental Protection Act (Act) (415 ILCS 5/7.2 and 17.5 (2018)) provide for quick adoption by the Board of regulations that are identical in substance to regulations that USEPA adopts to implement Sections 1412(b), 1414(c), 1417(a), and 1445(a) of the federal Safe Drinking Water Act (SDWA) (42 U.S.C. §§ 300g-1(a), 300g-3(c), 300g-6(a), and 300j-4(a) (2017)). The NPDWRs implement these sections of SDWA. SDWA regulations are found at 40 C.F.R. 141 through 143. Section 17.5 of the Act also provides that Title VII of the Act and Section 5 of the Illinois Administrative Procedure Act (APA) (5 ILCS 100/5-35 and 5-40 (2018)) do not apply to the Board's adoption of identical-in-substance regulations.

The Board will cause the proposed amendments to be published in the *Illinois Register* and will receive public comments for at least 45 days after publication. The Board expects to adopt final rules by the extended due date of March 31, 2020. The Board specifically requests public comment on the revised scheme for defined short-form names for analytical methods, reorganization of the incorporations by reference, and eliminating obsolete provisions and past implementation dates from the rules.

This opinion has four main segments. First, the Board extends the due date for final action on the amendments. Second, a timetable for completing this rulemaking follows. Third, the Board identifies USEPA's actions that resulted in this rulemaking and discusses the proposed amendments. Finally, the Board discusses the Board-initiated revisions. The text of the Board's proposed amendments is appended to this opinion and order. The Board invites public comment on the proposed amendments.

EXTENSION OF DUE DATE AND REASONS FOR DELAY

The Board finds it necessary to set forth reasons for delay and again extend the due date for final Board adoption of amendments.

Under Section 7.2(b) of the Act (415 ILCS 5/7.2(b) (2018)), the Board must complete this rulemaking within one year after the corresponding federal action. Based on the date USEPA approved additional methods, the Board's deadline to adopt final rules in this docket was October 12, 2018. Fulfilling that deadline was not possible. For the reasons below, the Board cannot adopt amendments before October 12, 2019. The Board finds it necessary to extend the date for completion until March 31, 2020.

The Board encountered unanticipated delay in development of this proposal for public comment. The volume and complexity of the amendments and unexpected shortage in staff resources delayed this proposal. Significantly, the Board found restructuring the incorporations by reference and changing the naming scheme for analytical procedures were necessary to simplify the rules. Further, unanticipated illness-and injury-related absences of Board staff working on the proposal caused further delay. The Board now anticipates completion of the present amendments no later than March 31, 2020.

TIMETABLE TO COMPLETE RULEMAKING

Adopting this proposal for public comment today will allow the Board to complete this rulemaking by March 31, 2020, barring unforeseen delays. The Board intends to adhere the following schedule:

Board order proposing amendments:	**December 19, 2019**
Submission for *Illinois Register* publication:	December 30, 2019
Estimated *Illinois Register* publication:	January 10, 2020
Estimated End of 45-day public comment period:	February 24, 2020
Board order adopting amendments:	**March 5, 2020**
Estimate of when rules take effect:	**March 16, 2020**
Estimated *Illinois Register* publication:	March 27, 2020

Extending the date completion until March 31, 2020 adds slight extra time to allow for unforeseen delays.

DISCUSSION

The discussion includes two main segments. The first considers adding the new ATPs into the analytical methods incorporated into Illinois Primary Drinking Water Regulations. The second considers Board-initiated revisions, including renaming analytical methods, reorganizing incorporations by reference, removing obsolete provisions and past implementation dates, and miscellaneous corrections and revisions.

Incorporation of Newly Approved Analytical Methods

Section 1401(1) of SDWA authorizes USEPA to summarily approve ATPs for demonstrating compliance with the NPDWRs. SDWA requires that the ATPs be equally effective as methods USEPA already approved by rulemaking. *See* 42 U.S.C. § 300f(1) (2017).

On October 12, 2018, USEPA granted expedited approval to about 100 ATPs for analysis of contaminants in drinking water. 83 Fed. Reg. 51636 (Oct. 12, 2018). Most of the approvals were for methods in the new 23rd edition of *Standard Methods for Examination of Water and Wastewater* (*Standard Methods*). Also included were one new USEPA method, two methods from The Hach Company, and four updated methods from ASTM International. The methods apply to a wide range of drinking and raw water parameters and analytes. USEPA later corrected a few of its new ATPs. 83 Fed. Reg. 54676 (Oct. 31, 2018).

The Board incorporates the new ATPs into the Illinois rules. The Board does not deviate from the substance of the USEPA's approval of the methods. There are several structural differences between USEPA's rules and the corresponding Illinois rules. The Board revises the federal text to accommodate these differences. The following paragraphs describe the Board's changes.

First, the Board revises the structure of the methods listings. USEPA generally lists all methods in tables—both those adopted by rule and the ATPs. The methods appear in subsection format in the Illinois rules. Further, USEPA lists the ATPs in an appendix to the rules and not with the methods adopted by rulemaking. The Illinois rules combine USEPA's ATPs with methods USEPA approved by rule.

Second, the Board changes how the rules refer to analytical methods in USEPA's rules. A combination of column headings and footnotes identify analytical methods and sources. The APA requires incorporation by reference. 5 ILCS 100/5-75 (2018). The Board defines short-form names for the analytical methods with the incorporation by reference and uses the short-form names to refer to the methods in the rules.

Third, the Board treats method sources differently than USEPA. The Board assigns methods and documents containing methods a defined short-form name. The short-form name definition acts as an incorporation by reference for the method. The Board arranged the short-form name definitions-incorporations by reference (D-IBRs) alphabetically in a single listing in 35 Ill. Adm. Code 611.102(a).

Discussion of the Board-initiated revisions to the rules includes a segment explaining the revised short-form naming scheme for analytical methods. That segment begins on page 8 below.

Fourth, the Board identifies and lists all sources found for each method. The Board does not limit identification to the sources named by USEPA.

Finally, the Board omits USEPA-approved methods from Standard Methods Online where the same version is available in a printed volume of *Standard Methods*. The discussion of short-form names for methods from the Standard Methods Organization (SM) explains this omission, beginning on page 8 below.

Tables appear in the Identical-in-Substance Rulemaking Addendum—Proposed (IIS-RA(P)) for this proceeding. Table 1 lists USEPA revisions that the Board does not include in this proceeding. Table 2 lists deviations from the literal text of the USEPA revisions. Table 3 lists Board corrections and revisions that do not directly derive from the current USEPA amendments. Table 4 lists versions of methods from the Standard Methods Organization that are available in multiple editions of *Standard Methods for the Examination of Water and Wastewater* and/or from Standard Methods Online (collectively, Standard Methods). Of particular interest are the Standard Methods that appear in the 23rd edition. Table 5C correlates the revised defined short-form names the Board now assigns analytical methods with the defined short-form names under the former naming scheme. The IIS-RA(P) is in the docket for this proceeding, available to review and download on the Board's website (www.ipcb.state.il.us) through the Clerk's Office On-Line (COOL).

The Board offers no explanation of most listed revisions. However, some entries in the IIS-RA(P) include notes explaining some changes, and this opinion elaborates on more significant issues.

USEPA 900.0 (18)

USEPA approved a 2018 version of its Method 900.0 for gross alpha and beta analyses. The newly approved method is Revision 1.0 of previously approved USEPA 900.0 from 1980. Under the revised defined short-form naming scheme, the D-IBR for the previously approved method is USEPA 900.0 (80), and that for the newly approved method is USEPA 900.0 (18). The previously approved version appears in "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA 600/4-80/032, August 1980 (USEPA Radioactivity Methods (80)). The newly approved revision is only available as a separate document.

Hach 10258 (18)

USEPA approved an ATP that is an updated version of Hach Method 10258, dated 2018, for turbidity. Under the revised D-IBR for the newly approved method is Hach 10258 (18). The D-IBR for the previously approved 2016 version is "Hach 10258 (16)."

SM 9222 J (15) from *Standard Methods*, 23rd ed.

USEPA approved Method 9222 J from the 23rd edition of *Standard Methods*. It is a method for simultaneous detection of total coliforms and *E. Coli*. The D-IBR for this method is SM 9222 J (15).

USEPA entered SM 9222 J (15) in both the total coliforms and *E. coli* listings in the table of approved alternative methods for 40 C.F.R. § 141.852(a)(5). The Board incorporated SM 9222 J (15) as a single, separate entry at 35 Ill. Adm. Code 611.1052(a)(5)(H) allowing its use for simultaneous detection of total coliforms and *E. Coli*.

SM 9230 D (13) from *Standard Methods*, 23rd ed.

USEPA added Methods 9230 C and 9230 D from the 23rd edition of *Standard Methods*. They are two methods for detection of enterococci. USEPA entered the ATPs from the 23rd edition in the table of approved alternative methods for 40 C.F.R. § 141.402(c)(2). *See* 83 Fed. Reg. at 51650. The D-IBRs for these methods are SM 9230 C (13) and SM 9230 D (13).

USEPA did not list SM 9230 D (13) in the discussion of new ATPs. *See* 83 Fed. Reg. at 51640. The omission fails to identify the method or methods approved by rulemaking to which SM 9230 D (13) is equally effective. *See* 42 U.S.C. § 300f(1) (2017); 83 Fed. Reg. at 51638.

USEPA approved the 89 Standard Methods from the 23rd edition listed in the *Federal Register* discussion because "The methods in the . . . table are the same as the earlier approved versions with respect to the sample handling protocols, analytical procedures, and method performance data." 83 Fed. Reg. at 51638. The methods previously approved for enterococci by rule are SM 9230 B (13) (a multiple tube technique), SM 9230 C (13) and USEPA 1600 (02) (two membrane filter techniques), and Enterolert (96) (a most probable number fluorogenic method). *See* 40 C.F.R. § 141.402(c)(2) (2019).

New SM 9230 D (13) is a fluorogenic substrate method—a methodology different from those approved by rule. The sameness of analytical procedures—one basis for USEPA approving the other 89 Standard Methods from the 23rd edition—is not likely the basis for approving SM 9230 D (13). Although USEPA did not give specific reasons for approving SM 9230 D (13), the approval itself implies that the method performs equally effective to one or more of the methods already approved by rulemaking. *See* 42 U.S.C. § 300f(1) (2017) (the basis for USEPA adding ATPs).

USEPA Revisions Omitted

USEPA included limited amendments that do not prompt Board action. Table 1 in the IIS-RA(P), Federal Amendments That Are Not Necessary in This Docket, lists and describes all of the omitted USEPA revisions. The following considers only the more significant of the omitted USEPA revisions.

ASTM D511-09. USEPA added ASTM D511-09 B at 74 Fed. Reg. 67908, 57915 (Nov. 10, 2009). USEPA subsequently erroneously changed this to "D 511-90" at 81 Fed. Reg. 46839, 46845 (July 19, 2016). USEPA corrected the error in its October 12, 2018 amendments. The Board did not propagate the error in SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017).

Standard Methods Online, Method 4500-CN$^-$ C-99. This is the version of Method 4500-CN$^-$ C that appears in *Standard Methods*, 21st and 22nd editions. Redesignating the version of Method 4500-CN$^-$ C that appears in the 21st and 22nd editions as "SM 4500-CN$^-$ C (99)" includes Standard Methods Online, Method 4500-CN$^-$ C-99.

Discussion of method versions from *Standard Methods* appears in the consideration of Board-initiated corrections beginning on page 8 below.

Excluding Methods for Secondary MCLs. USEPA added ATPs for analysis of parameters used to show compliance with drinking water secondary maximum contaminant levels (MCLs). The Board did not include USEPA's ATPs for aluminum, chloride, color, foaming agents, odor, silver, sulfate, or total dissolved solids for which USEPA established only secondary MCLs. *See* § 143.3 (2019).

The parameters that have secondary MCLs primarily affect the aesthetic quality of the water. 40 C.F.R. § 143.1 (2019). The Board's identical-in-substance mandate does not embrace secondary MCLs. 415 ILCS 5/17.5 (2019); *see* 42 U.S.C. § 300g-1(b) (2017) (SDWA § 1412(b)). The Board's focus in this proceeding is limited to NPDWRs. NPDWRs are human health-based standards. *See* 42 U.S.C. § 300f(1) (2017) (SDWA § 1401; definition of "primary drinking water regulation").

The Board did, however, add the new ATPs for iron, manganese, and zinc in 35 Ill. Adm. Code 611.612. While USEPA established only secondary MCLs for these contaminants, the Illinois rules include old State-only MCLs for them. 35 Ill. Adm. Code 611.300(b).

Retaining Registered Trademark Symbols. USEPA removed the registered trademark symbols from "Colilert®" and "Colisure®" in entries for *E. coli* in the table of ATPs for 40 C.F.R. § 141.402(c)(2). The Board believes this an inadvertent error.[1]

USEPA's omitting the registration symbols prompted Board review of trademark symbols in the Illinois rules. The Board's actions resulting from that review appear in discussion that begins on page 29 below.

Board-Initiated Revisions

The Board corrects and revises the existing text. These corrections and revisions are Board-initiated and do not derive from the present USEPA approval of new ATPs. Among the Board-housekeeping revisions are the following:

Incorporations by Reference-Related Changes

- Revised short-form method names and reorganized incorporations by reference
- Adding, correcting, and removing incorporations by reference
- Adding and removing sources for methods
- Correcting document numbers and search terms for USEPA methods
- Removing obsolete and updating outdated provisions

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[1] USEPA left the registered trademark symbols in the entries for "Readycult®" and "Chromocult®." USEPA left the registration symbols in the entries for "Colilert®" and "Colisure®" in the table of methods for 40 C.F.R. § 141.852(a)(5).

- Explaining Omitted Methods from Standard Methods Online

Miscellaneous Corrections to the Text

- Correcting Citations to the General Provision for SEPs
- Removing Obsolete Provisions and Updating Outdated Provisions
- Restoring Past Implementation Dates Previously Removed from the Text
- Correcting Information for Electronic Reporting
- Correcting a Structural Fault in the Code Text
- Applying Board Language Preferences
- Stylistic Changes Ordinarily Requested by JCAR
- Standardizing Use of Trademark Symbols
- Updating C.F.R and U.S.C. Incorporations by Reference and Removing Unnecessary Dates
- Removing Explanations of USEPA Expedited Methods Approvals

Table 3 in the IIS-RA(P) for this proceeding lists all Board housekeeping amendments. This opinion includes no further explanation of most of them. The following paragraphs consider only the more significant Board housekeeping.

Changes to Incorporations by Reference

Revised Short-Form Method Names and Reorganized Incorporations by Reference. The Board simplifies incorporating analytical methods into the Illinois rules. The Board revises the methods' short-form names and combines the definitions of short-form names with the incorporations by reference into a single D-IBR for each method. The Board organizes the D-IBR listings alphanumerically, rather than by source. The purpose is to facilitate future updates, reduce errors, and aid identifying and locating the methods and incorporations by reference.

Updating the SDWA analytical methods takes significant time and effort. The Board defines a short-form method name in 35 Ill. Adm. Code 611.102. The Board separately incorporates each method by reference in 35 Ill. Adm. Code 611.102, listing each method by its source(s). The substantive monitoring provisions refer to the methods by their defined short-form names. The process of adding and updating methods in these several listings invites errors.[2]

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[2] The notes appended to the entries for 35 Ill. Adm. Code 611.102(b) (SM Methods and "SM 9222 B (06)," "SM 9222 C (06)," and "SM 9223 (04)), 611.381(b)(1)(D)(i) and (c)(1)(D)(i), 611.611(a)(12)(A), 611.612(f), 611.1004(b)(2), and 611.1052(a)(5)(D) in Table 3 of the IIS-RA(P) for this rulemaking highlight examples of errors.

Organizing the Methods. The D-IBR listing for each method appears in alphanumerical order in 35 Ill. Adm. Code 611.102(a). Methods individually available are listed individually. Multiple methods from single sources are grouped together under abbreviated source designations.[3] The short-form names aid these listings by using the method source as a core element of the defined short-form name.

The source and contact information are included in each individual D-IBR listing for all but the methods grouped under multiple-method sources. The source and contact information for grouped methods is included in the group heading paragraph, with the exception of USEPA methods. The source and contact information for USEPA methods is under the "Sources of USEPA Methods" heading, described below.

Revised Defined Short-Form Name Format. Each revised short-form name is prefaced with an abbreviated source designation, followed by a method number or similar qualification, and ending with a version date. The revised short-form method names eliminate the redundant word "Method"; version, revision, and edition identifiers; and, for USEPA methods, the source office. The revised short-form names identify method versions by date. The added version dates are parenthetical. The dates replace edition, revision, and version numbers, which are now identified in the definition of the short-form name/incorporation by reference.

Adding version dates to ASTM and USGS methods is not necessary. The version date is already part of ASTM's and USGS's designation schemes.

Tables 5A and 5B in the IIS-RA(P) correlate former short-form names to the new revised short-form names.

Standard Methods. The revised defined short-form names for methods from the Standard Methods Organization (SM) are based on the SM method number and SM approval date for each version. The revised names vary from the SM method names in that they include the approval date and do not include a printed edition number.

USEPA limits monitoring to use of approved versions of methods. 72 Fed. Reg. 17902, 17903, 17904 (Apr. 10, 2007). For SM methods, USEPA approval of a method version does not include all documents including that version.

SM methods are available in two types of documents. SM methods appear in printed editions of *Standard Methods*, and they are available in a digital format from Standard Methods Online. Whether a printed edition or digital document, the SM designates versions of methods by the date an SM committee approved the method. This differs from how USEPA approves versions of SM methods.

USEPA approves versions of methods in *Standard Methods* by the printed edition number. USEPA approves digital versions from Standard Methods Online (SMO) by an

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[3] "ASTM," "EML," "Hach," "Lovibond," "Mitchell," "Palintest," "SM," "Technicon," "Tecta," and "USGS."

appended approval date. Thus, USEPA approval of a version of an SM method from a printed edition or SMO does not necessarily include all documents that include the method.

Basing the SM method version on committee approval date, one version of many SM methods appears in multiple printed editions of *Standard Methods*. The revised short-form name embraces a method as it appears in all editions in which it appears.

In most instances, USEPA approves a version of an SM method in all editions of *Standard Methods* in which it appears. For example, "SM 2510 B (97)" refers to Standard Method 2510 B from the 20th, 21st, 22nd, and 23rd printed editions and Method 2510 B-97 from Standard Methods Online.

This is not true for ten versions of SM methods that USEPA did not approve in all printed editions.[4] For example, USEPA did not add the 20th edition for SM 3111 B (93), SM 3111 D (93), SM 3112 B (93), and SM 3113 B (93),[5] despite the fact that it approved the 1993 versions of these methods in the 19th edition.[6] Similarly, USEPA added SM 3114 B (97) from the 21st edition but did not approve it from the 20th edition.[7]

With the first incorporation of ATPs in 2008,[8] the Board did not separately list methods from SMO that also appeared in a printed edition. Where USEPA has not approved a version of an SM method in all printed editions of *Standard Methods*, the Board limits the revised short-form name D-IBR. A parenthetical statement explains that USEPA has not approved the version of the method as it appears in a specified edition.

The following table lists all method versions from *Standard Methods* versions that USEPA approved in one edition but not in other editions of *Standard Methods*:

Method (Version)	Approved SM Edition	SM Edition(s) Not Approved
3111 B (1993)	19th edition	20th edition
3111 D (1993)	19th edition	20th edition
3112 B (1993)	19th edition	20th edition
3113 B (1993)	19th edition	20th edition
3114 B (1997)	21st edition	20th edition
4500-ClO_2 D (2000)	21st edition	22nd and 23rd editions
9221 D (1994)	20th edition	19th edition
9221 F (1994)	20th edition	19th edition
9230 B (1997)	20th edition	19th and 21st editions
9230 C (1997)	20th edition	19th and 21st editions

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[4] All of the methods not approved in all editions are marked in Table 4 of the IIS-RAP.

[5] USEPA added methods from the 20th edition in 2001. 66 Fed. Reg. 3466 (Jan. 16, 2001).

[6] 64 Fed. Reg. 62450 (Dec. 1, 1999).

[7] 72 Fed. Reg. 11199 (Mar. 12, 2007).

[8] In SDWA Update, USEPA Amendments (January 1, 2007 through June 30, 2007 and June 3, 2008), R08-7, SDWA Update, USEPA Amendments (July 1, 2007 through December 31, 2007), R08-13 (Dec. 18, 2008) (consol.).

Most approved digital SMO methods also appear in one or more printed editions. For those SMO digital methods that appear in printed editions of *Standard Methods*, the Board does not separately list SMO as a source. The exceptions are SM 3113 (04), SM 7110 D (17), and SM 9230 B (04), which do not appear in a printed edition. See the further discussion that begins on page 19 below.

USEPA Methods. USEPA methods are subdivided into two D-IBR listings and a listing of sources. "Numbered Methods" is a D-IBR listing of all numbered USEPA methods. "Unnumbered Methods" is a D-IBR listing of all USEPA methods that do not have numbers. "Sources of USEPA Methods" gives contact information for obtaining USEPA methods from their four sources: National Environmental Methods Index (NEMI); National Technical Resource Library (NTRL); USEPA, National Service Center for Environmental Publications (NSCEP); and USEPA, Office of Ground Water and Drinking Water (OGWDW).

USEPA methods are individually available or available in a larger document collecting several methods. Where individually available, the D-IBR fully identifies the document and its source. Where available in a collection of methods, the D-IBR identifies the document that includes the collection. A separate entry defines and identifies the document and its source(s).

Nearly all USEPA methods are numbered methods. The format of the revised defined short-form names for these is "USEPA [number] ([date])."

Methods from two USEPA references are not numbered. USEPA designates them by page numbers. The format of the defined short-form name for methods from "Interim Radiochemical Methodology for Drinking Water" is "USEPA IRM ([date]), pages xx-xx." Similarly, the names for methods in "Radiochemical Analytical Procedures for Analysis of Environmental Samples" appear in the format "USEPA RCA (79), pages xx-xx."

The rules include general references to two USEPA method documents and another multiple-method document that do not refer to specific methods. *Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions*, referenced in 40 C.F.R. § 141.25(b)(1), is called "USEPA ARP (73)" in Section 611.720(b)(1). *Technical Notes on Drinking Water Methods* in 40 C.F.R. §§ 141.74(a)(1), 141.23(k), 143.4(b), and 141.24(e)(1) is referred to as "USEPA Technical Notes (94)" in corresponding Sections 611.531(a)(2), 611.611(a), 611.612(f), and 611.645 preamble, respectively. *HASL Procedure Manual*, 27th ed. or 28th ed.,[9] referenced in 40 C.F.R. § 141.25(b)(2), are called "EML Procedures Manual (90) or EML Procedures Manual (97)" in Section 611.720(b)(2).

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[9] For specific methods, the federal rules allow use of the 27th and 28th editions of the EML Procedures Manual. 40 C.F.R. § 141.25(a) table and note 8 (2019).

Adding, Correcting, and Removing Incorporations by Reference. The Board found needed corrections to incorporations by reference. These include adding incorporations by reference, correcting existing incorporations by reference, and removing others.

ASTM D2036-06A. The Board corrects omission of an updated version of a method by adding the version to the Illinois rules. USEPA added ASTM D2036-06A as an updated version of a sample preparation method for cyanide in 2008.[10] The Board did not add the updated version to the preamble statement for cyanide methods.[11] The Board now corrects the error and adds ASTM D2036-06A.

ASTM D6508-00. The Board corrects "ASTM D6508-00(2005)" to "ASTM D6508-00" for fluoride, nitrate, nitrite, and orthophosphate. This extends USEPA corrections as to nitrate, nitrite, and orthophosphate to fluoride and revises earlier Board corrections to this method.

In 2007, USEPA added capillary ion electrophoresis for fluoride, nitrate, nitrite, and orthophosphate as "Waters Method D6508, Rev. 2." 72 Fed. Reg. 11200 (Mar. 12, 2007). When adopting the federal rule, the Board corrected this to ASTM Method D6508-00(2005), originally approved in 2000 and reapproved in 2005. SDWA Update, USEPA Amendments (January 1, 2007 through June 30, 2007 and June 3, 2008), R08-7, SDWA Update, USEPA Amendments (July 1, 2007 through December 31, 2007), R08-13 (Dec. 18, 2008). USEPA later corrected the entries for nitrate, nitrite, and orthophosphate to ASTM D6508-00, removing the footnote identifying the method as from Waters Corp. 77 Fed. Reg. 26072 (May 2, 2012).

In USEPA's rule, "D6508, Rev. 2" remains in the entry for fluoride. 40 C.F.R. § 141.23(k)(1) (2019). The Board believes that USEPA failed to correct the entry for fluoride by inadvertent error. The Board revises the entry for fluoride in addition to those for nitrate, nitrite, and orthophosphate.

Hach 10029 (99) (m-ColiBlue24). USEPA refers to "m-ColiBlue24" and "m-ColiBlue24® Test" for microbiological analyses.[12] This is proprietary Method 10029 from the Hach Company. The Board changed the revised defined short-form name for this method to "Hach 10029 (99) (m-ColiBlue24)," based on the standardized format for Hach methods.

NSF Standard 61, Section 9. Two Illinois provisions[13] cite to NSF 61, requiring incorporation by reference of NSF Standard 61, Section 9. As described below, relatively recent federal legislation obviates the incorporation by reference, and the Board removes the incorporation by reference.

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[10] At 73 Fed. Reg. 31616, 31625 (June 8, 2009), adding the method to appendix A to subpart C of 40 C.F.R. 141 (2019) (table for 40 C.F.R. § 141.23(k)(1)).

[11] 35 Ill. Adm. Code 611.611(a)(12)(A). In SDWA Update, USEPA Amendments (January 1, 2007 through June 30, 2007 and June 3, 2008), R08-7, SDWA Update, USEPA Amendments (July 1, 2007 through December 31, 2007), R08-13 (Dec. 18, 2008).

[12] In now-obsolete 40 C.F.R. § 141.21(f)(3) and (f)(6)(vii) (2019) and in 40 C.F.R. §§ 141.402(c)(2) and 141.852(a)(5) and (c)(6)(1) (2019).

[13] 35 Ill. Adm. Code 611.126(d)(3) and 611.356(g)(1)(A)(ii).

On the basis of USEPA's rules, the Illinois rules incorporate NSF Standard 61, Section 9 by reference. SDWA formerly required compliance with a voluntary industry standard for lead leaching from fittings and fixtures.[14] 42 U.S.C. § 300g-6(d)(3) and (e) (2011). USEPA's rules require compliance with the voluntary standard for lead leaching. 40 C.F.R. § 141.43(d)(2) and (e) (2019); *see* 40 CFR § 141.86(g)(1)(i)(B) (2019) (standard for lead leaching).[15] In 1997, USEPA determined that the September 1994 version of NSF 61, section 9 fulfilled the statutory requirements for a lead leaching standard. 62 Fed. Reg. 44684 (Aug. 22, 1997).

Based on the SDWA provision and USEPA's *Federal Register* notice of its determination with regard to NSF 61, the Board revised the Illinois rules to require compliance with NSF 61 in 1999. The Board incorporated by reference the then-most recent, November 1998, version of the standard.[16] SDWA Update, USEPA Regulations (January 1, 1998 through June 30, 1998), R99-6 (Feb. 4, 1999), slip op. at 5. In 2000, USEPA added the statutory lead leaching standard to its rules.[17] 65 Fed. Reg. 1950, 2003-04, 2007-10 (Jan. 12, 2000). USEPA cited to the SDWA provision requiring development of a standard, rather than to NSF 61.[18]

Effective in 2014, the Reduction of Lead in Drinking Water Act removed the lead leaching standard.[19] P.A. 111-380, § 2(a)(2), 124 Stat. 4131 (Jan. 4, 2011). The federal statutory change superseded USEPA's rule. The obsolete lead leaching requirement remains in 40 C.F.R. § 141.43(b).[20] USEPA proposed incorporating the statutory revisions into its rules in 2017. USEPA would remove existing 40 C.F.R. § 141.43 and replace it with a new subpart B in 40 C.F.R. § 143. 82 Fed. Reg. 4805 (Jan. 17, 2017).

Since SDWA no longer requires the lead leaching standard of NSF 61, the Board removes references to NSF 61 and its incorporation by reference.[21] The Board's rule is significantly outdated and keeping the incorporation by reference current would be nearly impossible.

The version of NSF 61 evaluated by USEPA was the fifth revision from September 1994.

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[14] SDWA also formerly provided a standard of 8.0 percent lead for pipes and pipe fittings. 42 U.S.C. § 300g-6(d)(2) (2011).

[15] USEPA's rule also incorporates an 8.0 percent maximum lead content standard. 40 C.F.R. § 141.43(d)(2) (2019).

[16] The Board later added a note citing the 1997 *Federal Register* notice of USEPA's determination in SDWA Update, USEPA Regulations (January 1, 2000 through June 30, 2000), R01-7 (Jan. 4, 2001), slip op. at p. 8.

[17] USEPA added the rule requiring maximum 8.0 percent lead content in 1987. 52 Fed. Reg. 20672, 20674 (June 2, 1987)

[18] This was likely based on the possibility that USEPA would accept another lead leaching standard in the future. *See* 65 Fed. Reg. at 1989.

[19] The legislation also changed the maximum lead content requirement to 0.25 percent and added a method for calculating lead content. P.A. 111-380, § 2(a)(2), 124 Stat. 4131 (Jan. 4, 2011).

[20] As does the 8.0 percent maximum lead content standard.

[21] From 35 Ill. Adm. Code 611.102(b), 611.126(d)(3), and 611.356(g)(1)(A)(ii).

The Board incorporated by reference the 13th revision from November 1998—the eighth revision in the barely more than four years after USEPA's acceptance. As of the most recent available to the Board, "NSF/ANSI 61-2016," the July 2016 revision, the NSF 61 had undergone its 34th substantive revision in 28 years (the 29th revision in the 22 years since the USEPA-approved 1998 revision). The most recent version is "NSF/ANSI/CAN 61-2018." (The Board has not determined the revision number.)

Inability to reference a specific version of NSF 61 would preclude incorporation by reference. *See* 5 ILCS 100/5-75 (2019). Prohibiting later versions and editions would impede applying a standard subject to frequent revision.

The present amendments replace the former NSF 61-reliant language about lead leaching with the language from SDWA.[22] The amendments also replace explanation of USEPA acknowledgement of NSF 61 with explanation of the Lead in Drinking Water Act[23] changing the standard.

SM 4500-ClO_2 D (93) and SM 4500-ClO_2 E (93). USEPA added SM 4500-ClO_2 D (93) and SM 4500-ClO_2 E (93) as printed in *Standard Methods*, 20th edition. 71 Fed. Reg. 387, 481 (Jan. 4, 2006). The Board did not add SM 4500-ClO_2 E (93) from the 20th edition and erroneously added SM 4500-ClO_2 D (93) from the 21st edition.[24]

The references to SM 4500-ClO_2 D (93) and SM 4500-ClO_2 E (93) appeared in the 19th and 20th editions of *Standard Methods*. By not excluding the 20th edition from the D-IBR for SM 4500-ClO_2 E (93), the Board corrects the former error with regard to that method. By doing nothing, the Board corrects the error with regard to erroneous inclusion of the 21st edition for SM 4500-ClO_2 D (93). SM 4500-ClO_2 D (00) appeared in the 21st edition.

SM 9221 F (01). USEPA allowed use of section 1 of SM 9221 F (94) and section 1 of SM 9221 F (99) when adopting the Revised Total Coliforms Rule (RTCR).[25] The Board included the method in 35 Ill. Adm. Code 611.1052(a)(5)(D) when incorporating the RTCR into the Illinois rules.[26] The Board later erroneously deleted the method.[27] Adding the 1994 and 1999 versions of Method 9221 F corrects this error.

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[22] 42 U.S.C. § 300g-6(d)(2) (2017).

[23] P.A. 111-380, § 2(a)(2) and (b), 124 Stat. 4131 (Jan. 4, 2011).

[24] In SDWA Update, USEPA Amendments (January 1, 2006 through June 30, 2006), R07-2, SDWA Update, USEPA Amendments (July 1, 2006 through December 31, 2006) R07-11 (July 26, 2007) (consol.)

[25] As the versions in *Standard Methods*, 20th and 21st editions, respectively. *See* 78 Fed. Reg. 10270, 10354-55 (Feb. 13, 2013). In 40 C.F.R. § 141.852(a)(5) table (2019).

[26] In SDWA Update, USEPA Amendments (January 1, 2013 through June 30, 2013), R14-8 (Jan. 23, 2014).

[27] In SDWA Update, USEPA Amendments (July 1, 2016 through December 31. 2016), R17-12 (Dec. 21, 2017)

<u>SM 9222 B (06), SM 9222 C (06), and SM 9223 (04).</u> The Board removes SM 9222 B (06), SM 9222 C (06), and SM 9223 (04) as they appear in the 22nd edition of *Standard Methods*. This corrects the previous error of adding these methods from the 22nd edition, which are not USEPA-approved.[28]

<u>SM 9223 B, as Listed in 40 C.F.R. 136.</u> USEPA's Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWR) requires use of the version of SM 9223 B cited in the Clean Water Act (CWA) analytical procedures provision, 40 C.F.R. § 136.3(a) for monitoring *E. coli*. 40 C.F.R. § 141.704(b)(2) (2019). When adopting corresponding 35 Ill. Adm. Code 611.1004(b)(2), the Board cited to the 18th, 19th, and 20th editions of *Standard Methods*,[29] which were the versions cited in the CWA analytical procedures provision[30] at that time.[31]

USEPA changed the 18th, 19th, and 20th editions to the version in *Standard Methods*. 22nd edition (SM 9223 B (04)) in 2012.[32] Although the Board updated the incorporations by reference of 40 C.F.R. § 136.3(a),[33] which would have included this USEPA update, this did not update the method version in 35 Ill. Adm. Code 611.1004(b)(2).

The Board now corrects this fault. The Board replaces the citation to specific versions of SM 9223 B with "version of SM 9223 B listed in 40 CFR 136.3(a)." The CWA analytical procedures provision is already incorporated by reference in 35 Ill. Adm. Code 611.102.

<u>USEPA 508.1 (95).</u> The Board erroneously added "(rev. 2.0)" to the method.[34] The Board should have added "(rev. 2.1)."[35] Changing "508.1(rev. 2.0)" to "508.1 (95)" obviates correcting the entry to "508.1 (rev. 2.1)."

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[28] USEPA added Standard Methods, 22nd ed., Methods 9222 D and 9223 B at 78 Fed. Reg. 32558 (May 31, 2013) and Methods 9222 D-06 and 9223 B-04 from Standard Methods Online at 79 Fed. Reg. 35081 (June 19, 2014). The Board erroneously also added Standard Methods, 22nd ed., Methods 9222 B, 9222 C, and 9223 to the incorporation by reference when adding Methods 9222 D and 9223 B in <u>SDWA Update, USEPA Amendments (January 1, 2013 through June 30, 2013)</u>, R14-8 (Jan. 23, 2014).

[29] SM 9223 B (92), SM 9223 B (94), and SM 9223 B (97), respectively.

[30] 40 C.F.R. § 136.3(a) (2005) (Table IA). USEPA adopted this provision in 2006. 71 Fed. Reg. 654, 772 (Jan. 5, 2006).

[31] In <u>SDWA Update, USEPA Amendments (January 1, 2006 through June 30, 2006)</u>, R07-2, <u>SDWA Update, USEPA Amendments (July 1, 2006 through December 31, 2006)</u>, R07-11 (July 26, 2007) (consol.).

[32] 77 Fed. Reg. 29758 (May 18, 2012).

[33] In <u>SDWA Update, USEPA Amendments (January 1, 2012 through June 30, 0212, July 2, 2012, and July 25, 2012)</u>. R13-12 (Jan. 24, 2013).

[34] In <u>SDWA Update, USEPA Amendments (January 1, 2009 through June 30, 2009)</u>, R10-1, <u>SDWA Update, USEPA Amendments (July 1, 2009 through December 31, 2009)</u>, R10-17, <u>SDWA Update, USEPA Amendments (January 1, 2010 through June 30, 2010)</u>, R11-6 (Dec. 2, 2010)

[35] The Board added "(rev. 2.1)" to the entries for atrazine and chlordane in 35 Ill. Adm. Code

USEPA 551.1 (95). The Board erroneously added USEPA 551.1 (95) to the entry for simazine.[36] The Board now removes the entry.

USEPA 1622 (99). The federal rules refer to "*Method 1622: Cryptosporidium in Water by Filtration/IMS/FA*, 1999, United States Environmental Protection Agency, EPA-821-R-99-001."[37] Although the Board has a file copy of this reference,[38] the Board could not obtain a copy of this version of Method 1622 from the usual sources of USEPA methods.[39]

The Board removed all references to USEPA 1622 (99) and its incorporation by reference from the rules. Thus, suppliers may not use USEPA 1622 (99) to demonstrate compliance with the source water monitoring requirements of the Long Term 2 Enhanced Surface Water Treatment Rule in Subpart Z of 35 Ill. Adm. Code 611.

Although USEPA approved the method, and the Board has a copy, the APA requires as follows:

> An agency may incorporate by reference these matters in its rules only if the agency, organization, or association originally issuing the matter makes copies readily available to the public. 5 ILCS 100/5-75(a) (2019).

Inability to locate a readily available copy of USEPA 1622 (99) precludes its incorporation by reference.

Adding and Removing Sources for Methods. This rulemaking occasions a review of sources for USEPA methods. Several changes for USEPA methods result from the review. The Board standardizes the format of methods listings and changes statements of availability.

The amendments add and delete sources in methods listings. The amendments also delete sources that the Board could not find. USEPA lists some of the deleted sources in its rules even though they are obsolete.

Each method or multiple-methods document listing gives the title, document number (if available), and the publishing agency. The publishing agency information may be obsolete and

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611.645.

[36] In SDWA Update, USEPA Amendments (January 1, 2009 through June 30, 2009), R10-1, SDWA Update, USEPA Amendments (July 1, 2009 through December 31, 2009), R10-17, SDWA Update, USEPA Amendments (January 1, 2010 through June 30, 2010), R11-6 (Dec. 2, 2010)

[37] In 40 C.F.R. § 141.707(c)(1)(vi) (2019).

[38] Downloaded January 18, 2012.

[39] NEMI; NTRL; USEPA, NSCEP; and USEPA, OGWDW. The only document found as document number "EPA-821-R-99-001" was "Uniform National Discharge Standards for Vessels of the Armed Forces—Phase II." The Board located USEPA 1622 (01), USEPA 1622 (05), USEPA 1623 (99), USEPA 1623 (01), and USEPA 1623 (05) under the document numbers given by USEPA.

not aid locating a copy of the document, but the Board retains the information to more fully identify the method or document.

Each method entry names the source(s) known to the Board.[40] The listings identify the multiple-methods document for methods in a multiple-methods document.[41] Where a method in a multiple-methods document is singly available from a source, a Board note identifies that source.

For methods only singly available and for multiple-methods documents, each entry lists the source(s) known to the Board.

Removing Standard Methods, 16th Edition. The Board removes the 16th edition of Standard Methods as a source of any analytical methods. This corrects a previous error[42] and does not substantively change the rules. The incorporations by reference include no methods from the 16th edition.

Removing USEPA, Water Resource Center. The Board removes the USEPA, Water Resource Center (WRC) as a source of any analytical methods. USEPA names WRC as a source for methods[43] in 40 C.F.R. §§ 141.402(c)(2), table notes 4, 5, 8, 10 & 11 and 141.852(c)(5) (2019). The Board could not locate the WRC. The methods formerly available through USEPA,[44] WRC are available from other federal sources.

Removing USEPA, Office of Research and Development. The Board also removes the USEPA, Office of Research and Development (ORD) as a source of analytical methods. USEPA's rules cite a branch of ORD, the National Exposure Research Laboratory (NERL), as a source of methods.[45] The USEPA, ORD webpage is not a current site. Only one of the methods

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[40] Of 104 USEPA methods, all but two (USEPA 525.3 (12) and newly added USEPA 900.0 (18)) are available from two or more sources. About 90 are available from three or more sources.

[41] About 68 of 104 USEPA methods appear in 12 multiple-methods documents. Of these, about 38 are individually available from NEMI and/or USEPA, OGWDW.

[42] The Board removed the entries for the 16th and 17th editions and all subsidiary methods from the entries listed under American Water Works Association in SDWA Update, Lead and Copper Rules Corrections (January 1, 1994 through June 30, 1994), R94-23, SDWA Update, Phase II, IIB and V Corrections and Analytical Methods Amendments (July 1, 1994 through December 31, 1994), R95-3 (June 15, 1995) (consol.). The Board corrected an error and restored the 17th edition to the entries listed under APHA in SDWA Update, USEPA Amendments (January 1, 1997 through June 30, 1997), R98-2 (Feb. 19, 1998). The Board erroneously later added the 16th edition to the entries for APHA and AWWA in SDWA Update, USEPA Amendments (January 1, 2013 through June 30, 2013), R14-8 (Jan. 19, 2014).

[43] E*Colite (98), Hach 10029 (99) (m-ColiBlue24), USEPA 1600 (02), USEPA 1601 (01), USEPA, 1602 (01), and USEPA 1604 (02).

[44] The methods cited by USEPA, *see supra* note 19.

[45] USEPA Technical Notes, USEPA 515.3 (96), and 549.2 (97) (40 C.F.R. § 141.24(e) (2019); USEPA 415.3 (05) (40 C.F.R. § 141.131(a)(2) (2019)); USEPA 1600 (02), USEPA 1601 (01),

USEPA attributes to ORD is available on a 2017 snapshot of the website.[46] All of the methods listed in the Board's rules as available from ORD[47] are available on other federal websites.

__Removing USEPA, National Environmental Publications Information System.__ The amendments remove USEPA, National Environmental Publications Information System (NEPIS) as a source for USEPA Technical Notes (94). USEPA, NEPIS is an obsolete website. A search for USEPA, NEPIS redirects to USEPA, NSCEP. USEPA Technical Notes (94) is available on the USEPA, NSCEP website.

__Removing USEPA, Environmental Monitoring and Support Laboratory.__ The Board also removes the USEPA, Environmental Monitoring and Support Laboratory (EMSL) as a source of analytical methods. The Board's rules list USEPA, EMSL as a source for several multiple-methods documents.[48] By recent searches, the Board could not locate a website for USEPA, EMSL.

__Changing National Technical Information System to National Technical Resource Library.__ The Board changes the National Technical Information System (NTIS) to NTRL. The U.S. Department of Commerce operates NTRL within NTIS to freely provide government technical documents to the public. The Board counts 21 USEPA methods and multiple-methods documents as available from NTRL.

The Board ensures that all entries for documents available from NTRL indicate the document number search term. The surest and most efficient method for document access is by document number search. NTRL document numbers are independent of the "EPA" document numbers also assigned documents. Generally, NTRL document numbers begin with "PB" followed by a two- or four-digit year code and a six-digit document number.[49]

__Retaining USEPA, National Service Center for Environmental Publications.__ The Board retains USEPA, NSCEP as a source for USEPA methods. The Board counts 48 USEPA methods and multiple-methods documents as available from USEPA, NSCEP. Although

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and USEPA 1602 (01) (40 C.F.R. § 141.402(c)(2) table notes 8, 10, and 11 (2019)); and USEPA 1604 (02) (40 C.F.R. § 141.402(c)(2) table note 4 and 40 C.F.R. § 141.852(c)(5)(i) (2019)).

[46] USEPA 415.3 (05). Other USEPA-approved methods listed on the website that USEPA has not attributed to ORD are USEPA 200.5 (03), USEPA 415.3 (09), and USEPA 525.3 (12). Snapshot of USEPA, ORD EPA Drinking Water Research Methods webpage: https://19january2017snapshot.epa.gov/water-research/epa-drinking-water-research-methods_.html (accessed September 23, 2019).

[47] USEPA 200.5 (03), USEPA 415.3 (05), USEPA 415.3 (09), USEPA 525.3 (12), and USEPA 549.2 (97). Each is available on one or more of NEMI; USEPA, OGWDW; or USEPA, NSCEP.

[48] Methods in USEPA ARP (76), USEPA IRM (76), USEPA Organic Methods (91), USEPA Organic Methods—Supplement I (90), USEPA Organic Methods—Supplement II (92), and USEPA Organic Methods—Supplement III (95).

[49] An exception is USEPA RCA (79) for which NTRL lists an unpunctuated version of the USEPA, EMSL document number.

USEPA, NSCEP lists all USEPA-approved methods from all sources, the Board lists USEPA, NSCEP only for those methods that the website provides a direct link. The Board does not list USEPA, NSCEP as a source for methods that lack a link or for which a link to another source website is provided.

The entries for documents available from USEPA, NSCEP indicate the document number search term for use. The surest and most efficient method for document access is by document number search. The search format is based on the USEPA document number, omitting "EPA" and punctuation from the document numbers.

Retaining National Environmental Methods Index. The Board retains NEMI as a source for several methods. The Board counts 63 USEPA methods and nine non-USEPA methods. As for USEPA, NSCEP, the Board lists NEMI as a source only for those methods that the website provides a direct link. The Board does not list NEMI as a source for methods for which a link to another source website is provided. This required removing NEMI as a source from several incorporations by reference.[50]

Retaining USEPA, Office of Ground Water and Drinking Water. The Board retains USEPA, OGWDW as a source for many USEPA methods. These 107 methods are those for which the USEPA, OGWDW website provides a link for direct access to the method from a third-party website (*e.g.,* Regulations.gov, NTRL, NEPIS, or Hach Company).

The Board removed USEPA, OGWDW from several other incorporations by reference.[51] The incorporations by reference do not include USEPA, OGWDW as a source for 27 other methods for which USEPA, OGWDW provides a link to a third-party website providing a download link instead of the method (*e.g.,* Indiana University library or NEMI) or the 700 methods for which USEPA, OGWDW provides a link to a third-party website that does not directly provide access to the method (*e.g.,* ASTM International, Standard Methods Organization, or U.S. Geological Service).

Correcting Document Numbers and Search Terms for USEPA Methods. NTIS document numbers facilitate finding documents on the NTRL website. A search term based on the USEPA document number is needed to find documents on the USEPA NSCEP website. The Board reviewed the document numbers and search terms for USEPA methods documents in incorporations by reference. Corrections resulted.

For example, adding NTRL as a source for Guidance Manual for Filtration and Disinfection (91) required adding "PB93-222933" as the document number to facilitate finding the document. Similarly, adding the document number "PB2001-108275" aids finding Kelada 01 (01) on the NTRL site. Correcting document number "PB222-154/7BA" to "PB222154" makes USEPA ARP (73) accessible on that site.

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[50] USEPA 1622 (05), USEPA 1623 (99), USEPA Organic Methods (91), USEPA Organic Methods—Supplement I (90), USEPA Organic Methods—Supplement II (92), USEPA Organic Methods—Supplement III (95), USEPA ARP (73), and USEPA IRM (76).

[51] USEPA 1622 (01), USEPA 1623 (01), USEPA 1623 (05),

Correcting the search term “600475008” to “600475008A” aids locating the USEPA-approved version of USEPA IRM (76). Document number EPA 600/4-75-008 applies to the 1975 version; the approved 1976 version bears document number EPA 600/4-75-008A.

Explaining Omitted Methods from Standard Methods Online. About 90 methods approved to date from SMO also appear in a printed edition of *Standard Methods*. Table 4 in the IIS-RA(P) lists all methods that appear in multiple editions, including those from SMO. Only three methods from SMO do not appear in a printed edition.[52]

In the incorporations by reference provision, a note explains that methods from SMO appearing in printed volumes are not separately listed. The note states that using SMO methods that are the approved version is acceptable. The individual D-IBRs indicate the SMO method only where that method does not appear in a printed volume.

The present amendments consolidate all explanations and standardize their format. The amendments moved the explanations to the end of each Section that lists the analytical methods.[53] Each listing includes each method from SMO pertinent to that Section which appears in a printed volume of *Standard Methods*.

Table 4 in the IIS-RA(P) lists the 74 versions of 44 SM methods that appear in multiple printed editions.

Miscellaneous Corrections to the Text

The Board corrects miscellaneous errors found in the text. These include correcting citations to the general provisions for special exception permits (SEPs), removing obsolete and updating outdated provisions, restoring previously deleted implementation dates, correcting information for electronic reporting, correcting a Code format fault in the text, applying Board language preferences, stylistic changes ordinarily requested by JCAR, standardizing use of trademark symbols, updating C.F.R and U.S.C. incorporations by reference and removing unnecessary dates from citations, and removing explanations of USEPA methods approvals.

Included are corrections to the amendments in Public Water Supplies: Proposed New 604 and Amendments to 35 Ill. Adm. Code 601, 602, 607, and 611, R18-17 (July 25, 2019). In that proceeding, the Board adopted several corrections and revisions to the drinking water rules on petition of the Agency.[54] JCAR requested several corrections to the adopted amendments. The Board also raises corrections on its own motion.

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[52] Methods 3113 B-04, 7110 D-17, and 9230 B-04. *See* 35 Ill. Adm. Code 611.102(b) (entry for Standard Methods Online).

[53] These are 35 Ill. Adm. Code 611.381, 611.531, 611.611, 611.645, 611.720, 611.802, 611.1004, and 611.1052.

[54] In Public Water Supplies: Proposed New 604 and Amendments to 35 Ill. Adm. Code 601, 602, 607, and 611, R18-17 (July 25, 2019).

The IIS-RA(P) for this proceeding lists all corrections included in this rulemaking, including those to the R18-17 amendments. The following discussion considers only the more significant corrections.

Correcting Citations to the General Provision for SEPs. The R18-17 amendments replaced the former general provision for SEPs, 35 Ill. Adm. Code 611.110(a), with new 35 Ill. Adm. Code 602.600. That rulemaking resulted in textual errors. First, critical segments of those amendments referred to "35 Ill. Adm. Code 602.200." The corrected provisions include the definition of "SEP." With removal of citations to 35 Ill. Adm. Code 611.110 that accompanied each reference to SEPs, the correct citation in this definition is critical. The amendments included this correction in three provisions in 35 Ill. Adm. Code 611.601, deletion of an erroneous citation to "35 Ill. Adm. Code 611.130" in 35 Ill. Adm. Code 611.101 ("level 2 assessment"), and deletion of a formerly overlooked citation to 35 Ill. Adm. Code 611.110 from 35 Ill. Adm. Code 611.1055(f).

Removing Obsolete Provisions and Updating Outdated Provisions. The amendments remove obsolete provisions that serve no function. This includes provisions that USEPA deleted but the Board failed to do so.

References to Provisions of the Total Coliforms Rule. USEPA adopted the Total Coliforms Rule (TCR) and Surface Water Treatment Rule (SWTR) in 1989. 54 Fed. Reg. 27486 (June 29, 1989) (SWTR); 54 Fed. Reg. 27544 (June 29, 1989) (TCR). Both rules include provisions for monitoring total coliforms.[55] The methods for testing total coliforms were nearly identical under the TCR and SWTR.[56] Only the TCR requires monitoring for *E. coli*.[57]

USEPA adopted the Revised Total Coliforms Rule (RCTR) in 2013.[58] The RTCR superseded the TCR monitoring requirements in 1996,[59] but not those of the SWTR.[60] The Board removed obsolete elements of the TCR.[61] However, cross references to removed elements remain in some provisions. The Board now corrects that oversight.

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[55] 40 C.F.R. § 141.21(f)(3) (2019) is SWTR monitoring, and 40 C.F.R. § 141.74(a)(1) (2019) is TCR monitoring.

[56] *Compare* 40 C.F.R. § 141.21(f)(3) and Appendix A to subpart C of 40 C.F.R. 141 (table for 40 C.F.R. § 141.21(f)(3)) (2019) *with* 40 C.F.R. § 141.74(a)(1) and Appendix A to subpart C of 40 C.F.R. 141 (table for 40 C.F.R. § 141.74(a)(1)) (2019). The SWTR does not allow use of any version of SM 9221 C, and not approved use of any methods from *Standard Methods*, 23rd edition for the SWTR.

[57] *Compare* 40 C.F.R. § 141.21(f)(6) (2019) *with* 40 C.F.R. § 141.74(a)(1) (2019).

[58] 78 Fed. Reg. 10270 (Feb. 13, 2013).

[59] 40 C.F.R. § 141.21(h) (2019).

[60] *See* 40 C.F.R. § 141.74 (2019) (affecting residual disinfectant concentration monitoring but not microbiological monitoring provisions).

[61] In SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21. 2017).

Reference for Routine Monitoring. The 2013 RTCR replaced the TCR monitoring requirements of 40 C.F.R. § 141.21(a) with 40 C.F.R. § 141.853 effective April 1, 2016. USEPA added sunset provisions changing references from the TCR to the RTCR in the Ground Water Rule (GWR) at 40 C.F.R. § 611.402(a)(2)(B) (2019).[62] The Board did not revise 35 Ill. Adm. Code 611.802(a)(2)(B) to correspond with USEPA's changes in the subsequent identical-in-substance rules update.[63] Thus, obsolete references to the TCR remainafter the Board's effort to remove obsolete provisions.[64] The Board now changes the citation to 35 Ill. Adm. Code 611.521 to 35 Ill. Adm. Code 611.1053 in 35 Ill. Adm. Code 611.802(a)(2)(B). This agrees with USEPA's citation to 40 C.F.R. § 141.853 in corresponding 40 C.F.R. § 141.402(a)(2)(ii).

References for EC-MUG and NA-MUG Procedures. The analytical methodology provisions of the TCR have one narrow area of continuing applicability. The GWR allows use of EC-MUG or NA-MUG for *E. coli* testing as described in a provision of the TCR after use of specified methods.[65] Essentially, the provision allows testing samples for *E. coli* after testing them for total coliforms.

The corresponding Illinois rule[66] cites to a provision[67] that the Board removed as obsolete in 2017.[68] Correcting the cross-reference to the now-repealed provision, the Board changes this to a citation to the provision of the TCR cited by USEPA's rule and incorporates the federal provision by reference.[69]

Method Versions for EC-MUG and NA-MUG Procedures. For the purpose of incorporation by reference, the Board must specify a specific version of the document. 5 ILCS 100/5-75(a) (2019). Incorporating by reference the federal provision allows citation to a specific version or edition of the rule, as required. However, this makes the Illinois rule rely on the federal rule to identify the analytical methods allowed.

A supplier must use the methods specified by the federal rule for the total coliforms and *E. coli* analyses; the Board cannot deviate from the federal rule and specify other methods—even to clarify or correct the federal rule.

Note 7 in the GWR table of analytical methods allows subsequent analyses for *E. coli* on samples used for total coliforms testing as provided in the TCR. Note 7 states as follows:

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[62] At 78 Fed. Reg. 10270, 10353 (Feb. 13, 2013).
[63] In SDWA Update, USEPA Amendments (January 1, 2013 through June 30, 2013), R14-8 (Dec. 21, 2017).
[64] In SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017).
[65] 40 C.F.R. § 141.402(c)(2) table, note 7 (2019).
[66] Board note to 35 Ill. Adm. Code 611.802(c)(2)(A).
[67] 35 Ill. Adm. Code 611.526(f)(1) and (f)(2) (2019).
[68] In SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017).
[69] 40 C.F.R. § 141.21(f)(6)(i) and (f)(6)(ii) (2019).

> EC–MUG (Method 9221F [sic]) or NA–MUG (Method 9222G [sic]) can be used for E. coli testing step as described in § 141.21(f)(6)(i) or (ii) after use of Standard Methods 9221 B, 9221 D, 9222 B, or 9222 C.[70]

After testing samples for total coliforms using SM 9221 B, SM 9221 D, SM 9222 B, or SM 9222 C, the supplier can test the samples for *E. coli* using specified versions of SM 9221 F[71] or SM 9222 G. Neither Note 7 nor the referenced TCR provision specifies methods versions for total coliforms analyses.

Another TCR provision identifies methods for total coliforms, but it is unlikely that any supplier would perform any analyses for total coliforms under this rule. The total coliforms monitoring provision identifies versions of SM 9221 B, SM 9221 D, SM 9222 B, and SM 9222 C.[72] [73] However, testing for total coliforms under the TCR is no longer required, so it is unlikely that testing will occur under this rule.

When USEPA adopted the GWR in 2006, it intended follow-up testing for *E. coli* on total coliform- positive samples tested under the TCR.[74] Since the RTCR replaces the TCR, and because USEPA retains Note 7, the issue is whether USEPA intends that follow-up testing continue on total coliforms-positive samples drawn for the RTCR or some other rule.

The SWTR and RTCR are the only rules that presently use any of the methods listed in Note 7 for total coliforms. The SWTR authorizes use of versions of SM 9221 B, SM 9222 B, and SM 9222 C.[75] The SWTR, however, does not approve any version of SM 9221 D.[76] The RTCR authorizes use of versions of all four methods.[77]

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[70] *See supra* note 51.

[71] The referenced TCR rule actually specifies SM 9222 from the 19th or 20th editions of *Standard Methods* (SM 9222 G (94) or SM 9222 G (97)) for EC-MUG. 40 C.F.R. § 141.21(f)(6)(i) (2019). The table of methods for the GWR cites SM 9221 F (94) from the 19th or 20th editions. 40 C.F.R. § 141.402(c)(2) (2019).

[72] SM 9221 B (93), SM 9222 B (91), and SM 9222 C (91) from the 18th edition of *Standard Methods*; SM 9221 B (94), SM 9222 B (94), and SM 9222 C (94) from the 19th edition; SM 9221 B (94), SM 9222 B (97), and SM 9222 C (97) from the 20th edition; SM 9221 B (99), SM 9221 D (99), SM 9222 B (97) and SM 9222 C (97) from the 21st edition; and SM 9221 B (06) from the 22nd edition.

[73] 40 C.F.R. § 141.21(f)(3) and appendix A to subpart C of 40 C.F.R. 141 (2019).

[74] 71 Fed. Reg. 65574, 65593 (Nov. 8, 2006).

[75] *See supra* note 54. Additionally, SM 9221 B (14), SM 9222 B (16), and SM 9222 C (16) from the 23rd edition.

[76] 40 C.F.R. § 141.852 and appendix A to subpart C of 40 C.F.R. 141 (2019).

[77] SM 9221 B.1 (94), SM 9221 B.2 (94), SM 9221 D.1 (94), SM 9221 D.2 (94), SM 9222 B (97), and SM 9222 C (97) from the 20th edition; SM 9221 B.1 (99), SM 9221 B.2 (99), SM 9221 D.1 (99), SM 9221 D.2 (99), SM 9222 B (97), and SM 9222 C (97) from the 21st edition; SM 9221 B.1 (99) and SM 9221 B.2 (99) from the 22nd edition; and SM 9221 B.1 (06), SM 9221 B.2 (06), SM 9221 B.3 (06), SM 9221 B.4 (06), SM 9221 D.1 (06), SM 9221 D.2 (06), SM 9221 D.3

Absent indication from USEPA to the contrary, the Board believes that the federal rule allows follow-up testing for *E. coli* for purposes of the GWR on total coliforms-positive samples tested using these cited RTCR and SWTR methods.

The Board observes that a newly authorized ATP allows simultaneous detection of total coliforms and *E. coli* under the RTCR.[78] The Board further observes that the same method is approved for *E. coli* analyses under the GWR.[79] This has nothing to do with the follow-up testing on total coliform-positive samples. Note 7 and 40 C.F.R. § 141.21(f)(6)(i) and (f)(6)(ii) specify use of SM 9221 F (94),[80] SM 9222 G (94), and SM 9222 G (97) for this purpose.

Comment on Use of the Multiple Tube Tests for Total Coliforms. USEPA's original filtration and disinfection rule included a note allowing use of a five-tube or ten-tube procedure for total coliforms by the multiple tube technique.[81] USEPA removed the note in the course of analytical methods revisions in 1994.[82] The Board did not remove the note when incorporating USEPA's revisions into 35 Ill. Adm. Code 611.531(b).[83] Instead, the note became appended to 35 Ill. Adm. Code 611.531(b)(5)(B).

Comments on USEPA Technical Notes (94). The Board corrects Board notes relating to USEPA Technical Notes (94). USEPA provisions for analytical procedures for inorganic and organic chemical contaminants refer to USEPA Technical Notes (94) for additional information on analytical procedures.[84] The Board corrects the listing of contaminants in the Board note for inorganic chemical contaminants. The Board adds a listing of contaminants in the Board note for secondary chemical contaminants. The Board removes two obsolete statements relating to use of methods from USEPA Technical Notes (94).

List of Inorganic Chemical Contaminants. USEPA added the second sentence relating to USEPA Technical Notes when revising the list of methods for inorganic chemical

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(06), SM 9222 B (15), and SM 9222 C (15) from the 23rd edition. 40 C.F.R. § 141.852(a)(5) (2019) and appendix A or subpart C of 40 C.F.R. 141 (2019) (table for 40 C.F.R. § 141.852(a)(5)).

[78] SM 9222 J (15). Appendix A to subpart C of 40 C.F.R. 141 (2019) (table for 40 C.F.R. § 141.852(a)(5)).

[79] Appendix A to subpart C of 40 C.F.R. 141 (2019) (table for 40 C.F.R. § 141.402(c)(2)).

[80] *See supra* note 53.

[81] Appended to 40 C.F.R. § 141.74(a)(2) (1988), added at 54 Fed. Reg. 27486, 27531 (June 29, 1989). The Board appended the note to corresponding 35 Ill. Adm. Code 611.531(b) relating to five-tube or ten-tube tests in Safe Drinking Water Act Regulations, R88-26 (Aug. 9, 1990).

[82] At 59 Fed. Reg. 62450, 62470 (Dec. 5, 1994).

[83] In SDWA Update, Lead and Copper Rules Corrections (January 1, 1994 through June 30, 1994), R94-23, SDWA Update, Phase II, IIB & V Corrections and Analytical Methods Amendments (July 1, 1994 through December 31, 1994), R95-3 (June 15, 1995) (consol.).

[84] 40 C.F.R. § § 141.23(k)(1), 141.24(e)(1), 141,74(a)(1), and 143.4(b) (2019).

contaminants.[85] The Board omitted barium, beryllium, cadmium, and calcium from the list of contaminants when incorporating USEPA's revisions.[86] The Board now corrects this error.

List of Secondary Chemical Contaminants. USEPA added the second sentence relating to use of USEPA Technical Notes when revising the provision specifying methods for secondary chemical contaminants.[87] The Board omitted the list of analytes when incorporating USEPA's revisions.[88] The Board now corrects this error.

Obsolete Statements Relating to Use of Methods. Notes appended to the lists of methods for inorganic chemical contaminants and organic chemical contaminants formerly included the statement, "This document contains other analytical test procedures and approved analytical methods that remain available for compliance monitoring until July 1, 1996."[89] 40 C.F.R. § § 141.23(k)(1) and 141.24(e)(1) (1999). The Board added the statements to the incorporation by reference for USEPA Technical Notes (94) in 35 Ill. Adm. Code 611.102(b).[90]

USEPA removed the statement from 40 C.F.R. § 141.24(e)(1) in 1999.[91] The Board failed to remove the Board note from 35 Ill. Adm. Code 611.645 in the subsequent SDWA update.[92] USEPA removed the statement from 40 C.F.R. § 141.23(k)(1) in 2009.[93] The Board failed to remove the Board note from 35 Ill. Adm. Code 611.611 in the SDWA update.[94] The statements remain appended to Board notes to incorporations by reference for USEPA Technical Notes (94) in 35 Ill. Adm. Code 611.102(b). The Board now corrects these errors.

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[85] Revising 40 C.F.R. § 141.23(k)(1) at 59 Fed. Reg. 62450, 62466 (Dec. 5, 1994).

[86] Amending 35 Ill. Adm. Code 611.611(a) in SDWA Update, Lead and Copper Rules Corrections (January 1, 1994 through June 30, 1994), R94-23, SDWA Update, Phase II, IIB & V Corrections and Analytical Methods Amendments (July 1, 1994 through December 31, 1994), R95-3 (June 15, 1995).

[87] Revising 40 C.F.R. § 143.4(f) at 59 Fed. Reg. 62450, 62470-71 (Dec. 5, 1994).

[88] Amending 35 Ill. Adm. Code 611.612(f) in SDWA Update, Lead and Copper Rules Corrections (January 1, 1994 through June 30, 1994), R94-23, SDWA Update, Phase II, IIB & V Corrections and Analytical Methods Amendments (July 1, 1994 through December 31, 1994), R95-3 (June 15, 1995) (consol.).

[89] USEPA added the statements as part of analytical methods amendments in 1994. 59 Fed. Reg. 62450, 62466, 62468 (Dec. 5, 1994).

[90] In SDWA Update, Lead and Copper Rules Corrections (January 1, 1994 through June 30, 1994), R94-23, SDWA Update, Phase II, IIB and V Corrections and Analytical Methods Amendments (July 1, 1994 through December 31, 1994), R95-3 (June 15, 1995) (consol.).

[91] At 64 Fed. Reg. 67449, 67464 (Dec. 1, 1999).

[92] In SDWA Update, USEPA Amendments (July 1, 1999 through December 31, 1999), R00-10 (Aug. 24, 2000).

[93] At 74 Fed. Reg. 30953, 30957 (June 29, 2009).

[94] In SDWA Update, USEPA Amendments (January 1, 2009 through June 30, 2009), R10-1, SDWA Update, USEPA Amendments (July 1, 2009 through December 31, 2009), R10-17, SDWA Update, USEPA Amendments (January 1, 2010 through June 30, 2010), R11-6 (Dec. 2, 2010).

<u>Obsolete MCLs and Treatment Technologies for TTHM and HAA5.</u> The Board removes obsolete maximum contaminant levels (MCLs) and best available treatment technologies for total trihalomethanes (TTHM) and the five haloacetic acids (HAA5).[95] USEPA adopted the old rule as the Disinfectants and Disinfection Byproducts Rule (DDBR) in 1998.[96] USEPA adopted the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DDBR) in 2006.[97] The Stage 2 DDBR revised the DDBR to no longer apply on the compliance date of the disinfection byproducts requirements of the Stage 2 DDBR.[98] The compliance deadlines for the Stage 2 DDBR ranged from April 1, 2012 through October 1, 2014.[99]

The obsolete provisions of the DDBR in 35 Ill. Adm. Code 611.312(b) serve no present purpose. The Board should have removed these provisions when removing the obsolete compliance deadlines from the Illinois Stage 2 DDBR.[100] The present amendments correct that oversight.

<u>Now-Past Cryptosporidium Treatment Compliance Dates.</u> The Board removes now-past dates for compliance with the *Cryptosporidium* treatment requirements of the LT2ESWR. The LT2SWTR required suppliers to comply with Cryptosporidium treatment requirements before a date between April 1, 2012 and October 1, 2014, depending on the size of the population served.[101] These past dates serve no present purpose.

The Board replaces the former requirements for compliance before a deadline to a requirement for immediate compliance in 35 Ill. Adm. Code 611.1013(c). The Board adds a note explaining the now-past compliance dates in the federal rule. Removing the compliance dates allows removing the provision that allowed the Agency to grant a two-year extension of the compliance date that was 35 Ill. Adm. Code 611.1013(c)(5). The latest possible extension would have expired October 1, 2016.

<u>Repealing Obsolete Table A.</u> The Board repealed diverse obsolete provisions of the TCR from the Illinois drinking water standards in 2017.[102] Among the repealed provisions were several microbiological monitoring requirements in Subpart L of 35 Ill. Adm. Code 611.

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[95] This correction derives from the Agency rulemaking proposal in <u>Clean-Up: Amendments to 35 Ill. Adm. Code Parts 291, 211, 212, 214, 215, 216, 218, 219, 225, 228, 232, 237, 301, 302, 303, 304, 306, 309, 401, 402, 403, 404, 405, 501, 611, 615, 616, 617, 722, 811, 812, 855, and 1000</u> filed with the Board January 10, 2018.

[96] 40 C.F.R. § 141.64 (2019), adopted at 63 Fed. Reg. 69390 (Dec. 16, 1998).

[97] Subparts U and V of 40 C.F.R. 141, adopted at 71 Fed. Reg. 387 (Jan. 4, 2006).

[98] 40 C.F.R. § 141.64(b) (2019).

[99] 40 C.F.R. § 141.620(c) (2019) (depending on the population served and whether monitoring for *Cryptosporidium* was required).

[100] The Board removed the past compliance dates from 35 Ill. Adm. Code 611.970(c) in SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017).

[101] 40 C.F.R. § 141.713(c)

[102] In <u>SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016)</u>, R17-12

The sole function of Table A of 35 Ill. Adm. Code 611 was supporting now-repealed 35 Ill. Adm. Code 611.521(b). The Board should have repealed Table A with Section 611.521(b). The Board now corrects that oversight.

Removing an Obsolete Statement of Derivation. The R18-17 amendments removed former subsection (b) of 35 Ill. Adm. Code 611.121. That provision derived from a former State-only provision.[103] However, the R18-17 amendments did not remove the reference to the State-only provision from the statement of derivation. The present amendments do so.

Removing a Past Effective Date. The prohibition against lead in plumbing is subject to a past effective date. The prohibition applies to pipe, fittings or fixtures, and solder or flux used in installation or repair after June 19, 1986. This date is long past, and all use of pipe, fittings or fixtures, and solder or flux in installation or repair occurs subject to the prohibition. The Board removes the date from 35 Ill. Adm. Code 611.126(a).

Removing Obsolete Disinfection DDBR MCLs and Cross-Reference to Stage 2 DDBR Compliance Dates. The MCLs disinfection byproducts (DBPs) of the DDBR in 35 Ill. Adm. Code 611.312(b)(1) applied only until implementation of the Stage 2 DDBR. The Stage 2 DDBR compliance deadlines in 35 Ill. Adm. Code 611.670(c) ranged from April 1, 2012 through October 1, 2014. The Board should have removed subsection (b)(1) as obsolete in SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017). The present amendments remove subsection (b)(1) as obsolete and the now-unnecessary topical subheading in subsection (b)(2) and renumbered subsections (b)(2)(A) through (b)(2)(C) as subsections (b)(1) through (b)(3).

The Board removed the past compliance dates for the Stage 2 DDBR in R17-12. Newly renumbered 35 Ill. Adm. Code 611.312(b)(1) requires compliance with the Stage 2 DDBRs "beginning the date specified for Subpart Y compliance in Section 611.980(c)." This errs in two ways: (1) there are no longer compliance dates for Subpart Y, and (2) the reference for Subpart Y compliance should have cited "Section 611.970(c)." The present amendments change the quoted segment of subsection (b)(1) to read "as required in Section 611.970(c)."

Removing a Cross-Reference Corresponding with a "Reserved" USEPA Provision. The Board removed 35 Ill. Adm. Code 611.646(e) as obsolete in R17-12. A cross-reference to "subsection (e) or (f)" remains in 35 Ill. Adm. Code 611.646(g). The amendments now remove the reference to subsection (e).

Restoring Past Implementation Dates Previously Removed from the Text. The Board previously removed past implementation dates from the LT2ESWTR.[104] All of the dates

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(Dec. 21, 2017).

[103] The initial adoption of NPDWRs into the Illinois rules in Safe Drinking Water Act Regulations, R88-26 (Aug. 9, 1990) moved former 35 Ill. Adm. Code 604.201 into 35 Ill. Adm. Code 611.121(b).

[104] In SDWA Update, USEPA Amendments (July 1, 2016 through December 31, 2016), R17-12 (Dec. 21, 2017).

for beginning the initial and second rounds of source water monitoring are past.[105] However, the time for completing the second-round monitoring is 24 months.[106] The dates remain relevant until implementing the LT2ESWR is complete. All of the times for completing the second round of source water monitoring will pass by the end of April 2021.[107] The Board restores the dates until after implementing the rule is past.

Correcting Information for Electronic Reporting. USEPA's LT2ESWR requires suppliers to submit their sampling schedules to USEPA digitally. The rule does not name the data system receiving the reporting. Instead, the rule specifies the Internet address.[108] The Board used USEPA's language and specified the Internet address in 35 Ill. Adm. Code 611.1002(a)(2). The Internet address is no longer valid. The Board learned this in the course of the R18-17 rulemaking. The Board deleted the Internet address in R18-17. The Board now identifies the data system that USEPA uses for receiving the required sampling schedules in the rule.

USEPA developed the Data Collection and Tracking System (DCTS) for receiving LT2ESWTR and other drinking water-related digital reports. Access to the DCTS is through USEPA's Central Data Exchange (CDX). *Step-by-Step Guide to the Data Collection and Tracking System (DCTS)*, USEPA, Office of Water, document number EPA 816-B-08-001 (Feb. 2008).

Subsections (a)(2)(A) and (a)(2)(B) now require submitting the schedules into the Data Collection and Tracking System (DCTS) through USEPA's Central Data Exchange (CDX). An appended Board note explains that USEPA requires registration with the CDX for use of the DCTS.

Correcting a Code Format Fault in the Code Text. Prior amendments[109] caused the texts of 35 Ill. Adm. Code 611.720(a)(7)(F) and (a)(7)(F)(i) to run together in the text filed with the Office of the Secretary of State.[110] Restructuring the text into subsections (a)(7)(A) and (a)(7)(B) obviates separating the subsections.

Applying Board Language Preferences. Some of the amendments relate to changing language, spelling, or usage to comport with Board preferences.

"System" vs. "Supplier." With the initial incorporation of USEPA's NPDWRs into the Illinois rules, the Board has used "supplier" in place of "system" to describe the entity responsible for compliance. In the Board's perception, a system is a physical thing, and a

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[105] The latest date, April 1, 2019, was the deadline for a small system supplier to begin its second round of monitoring for *Cryptosporidium*. 40 C.F.R. § 141.701(c) table (2019).
[106] 40 C.F.R. § 141.701(a)(4) and (b) (2019).
[107] The deadline for a small system supplier to complete second round monitoring.
[108] 40 C.F.R. § 141.702(a)(2) (2019) (specifying https://intranet.epa.gov/lt2/).
[109] In SDWA Update, USEPA Amendments (July 1, 2017 through December 31,2017), R18-9
[110] The error did not appear in the published text of the adopted amendments. 42 Ill. Reg. 9316, 9487 (June 8, 2018).

supplier is a person. The rules apply to persons, not things. *See* Safe Drinking Water Act Regulations, R88-26 (Aug. 9, 1990), slip op. at 39-40.

An error in the heading of 35 Ill. Adm. Code 611.1010 prompts a clarifying revision on this point. The text on file was "Filtered Systems" with the filing of the prior SDWA update, SDWA Update, USEPA Amendments (July 1, 2017 through December 31, 2017), R18-9 (May 10, 2018). The Board inadvertently changed this to "Filtered Suppliers" on final adoption of R18-17. JCAR requested correction in a future rulemaking.

This provision pertains to suppliers having filtered systems. Thus, the Board changed the Section heading to refer to "Filtered System Suppliers." This agrees with use of "GWS Suppliers" for the Ground Water Rule in Subpart S.[111]

The Spelling "Exceedance." Instances of changing the spelling "exceedance" to "exceedance" occurred in the R18-17 amendments. The Board formerly used "exceedence," but increasing use of "exceedance" by USEPA and in dictionaries prompted the Board to begin using "exceedance."[112]

Changing "Pursuant to" to "Under." The R18-17 amendments changed many occurrences of "pursuant to" to "under." The Board changes all other occurrences of "pursuant to" remaining in the text of Part 611.[113]

Correcting the Conjunction in the Definition of "Treatment." At the request of JCAR, the Board revised several provisions in R18-17 to remove non-limiting language from

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[111] Headings for 35 Ill. Adm. Code 611.801 and 611.803 through 611.805.

[112] *See* SDWA Update, USEPA Amendments (January 1, 2015 through June 30, 2015), R16-4 (Nov. 5, 2015), slip op. at 5-6.

[113] In 121 occurrences in 35 Ill. Adm. Code 611.102 ("bin classification," "40/30 certification," "GAC10," "initial distribution system evaluation," "significant deficiency," "standard monitoring," "system-specific study plan." "very small system waiver," and "wellhead protection area"); 611.105 preamble, (a)(1)(B), (a)(2)(B), and (g); 611.111(a), (a)(1), (d), (f), and (g); 611.112(a), (a)(1), (e), (f), and (h); 611.113(a), (b), (e)(2), and (f); 611.114 preamble; 611.130(a)(3) and (b)(3); 611.130(f)(4); 611.131(a), (c)(2)(B), (e)(1), (e)(3), (f)(2)(D)(ii), (i), and (j); 611.212 preamble; 611.220(c); 611.232 preamble; 611.141(c)(2); 611.261(b)(8); 611.262(b)(3) and (b)(3)(G); 611.290(b); 611.352(f) and (g)(1); 611.353(b)(6)(E); 611.354(f)(1)(A); 611.357(a)(1)(A), (c)(1), (c)(2), (d)(1), (d)(2), (e)(2)(A)(i), (e)(2)(A)(ii), and (e)(4); 611.358(d)(1); 611.360(a)(2)(A), (c)(4), and (e)(2)(B); 611.383(b)(1)(C), (b)(2), (b)(3), (c)(1)(A), (c)(1)(B), (c)(2)(A), (c)(2)(B), and (d); 611.490(a)(1) and (a)(3); 611.532(f)(2); 611.601(a)(3); 611.604(b)(2)(B); 611.605(c)(1)(B); 611.611(a), (b), and (c)(1); 611.646(h), (i), and (j)(1); 611.720(a); 611.802(a)(2)(A), (a)(2)(B), and (g); 611.902(a), (b), (c)(1), and (c)(4); 611.924(a); 611.970(c)(1)(B); 611.979(a)(1)(C); 611.1001(a)(3)(B) and (a)(5); 611.1002(a); 611.1003(a); 611.1006(a), (c), (d), (e), and (e)(2)(H); 611.1010(a), (b)(4), (c), (c)(1), (c)(2), (c)(3), (c)(4), (c)(5), (d), (e)(1), and (e)(2); 611.1012(a)(1), (a)(2), and (a)(4); 611.1055(c); and 611.Appendix G (¶¶ II.A, IV.C, and IV.g).

expressions like "including but not limited to."[114] The assumption is that "including" is itself non-limiting, and "but not limited to" is redundant.

In the definition of "treatment," however, the use of the conjunction "and" in the list of processes that are treatment, could imply that the aggregate of processes is intended. The Board changed the conjunction to "or" to clarify that the intent is that individual processes are examples of treatment.

Removing "Samples" from the Provision for Small System Waivers. At the request of JCAR in R18-17, the Board twice added "samples" to the provision for small system waivers. The object of the provision in 35 Ill. Adm. Code 611.924(b) is "monitoring or study." Adding "samples" obscures this. The amendments now remove both instances of "samples."

Consistent Use of Numbers "One" through "Ten." The Board consistently represents the numbers one through ten in written form and larger numbers as digits.[115] The present amendments change several numbers into written format. The change "10" to written "ten" represents the most frequent change.[116]

Stylistic Changes Ordinarily Requested by JCAR. The present amendments include several revisions of the sort ordinarily requested by JCAR. Some are corrections to the R18-17 amendments.

The corrections include changing topical subheadings to title case and revising their punctuation, such changes as "within [a stated time] of" to "within [a stated time] after," removing "of this Section" and "of this Part" from cross-references, and moving commas and periods outside closing quotation marks.

The Board indicates the JCAR-anticipated revisions in Table 3 of the IIS-RA(P). The Board marked them with an asterisk.

Standardizing Use of Trademark Symbols. The trademark symbols (® and ™) act as notice that someone asserts ownership of a symbol or name as a trademark. The symbol "®" indicates registration of the mark with the U.S. Patent and Trademark Office. 15 U.S.C. § 1111 (2018). The registered trademark symbol is prima facie evidence of ownership of and right to

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[114] From the definitions of "disinfectant," "disinfection byproduct." "significant deficiency," "treatment" in 35 Ill. Adm. Code 611.101.

[115] There are exceptions, such as numbers that are part of citations, dates, unitized numbers (*e.g.*, percentages, temperatures, lengths, concentrations, etc.), and numbers in decimal form. However, the present amendments twice change "10 percent" to "ten percent" in 35 Ill. Adm. Code 611.531(a)(2)(A)(i) Board note.

[116] In 35 Ill. Adm. Code 611.131(f)(2)(C); 611.232(a)(1); 611.241(c); 611.242(b); 611.360(a)(1)(H); 611.531(a)(2)(A)(i); 611.532(a)(2)(A)(i); 611.921(b)(1)(I), (b)(1)(J), and (c)(4); 611.922(b)(7); 611.923(b)(4); 611.979(a)(1) and (a)(2); 611.1006(a); 611.1015(c)(2)(C); 611.1017(c)(2); 611.1052(a)(5)(A)(i); and 611.1061(a)(4).

use the mark. 15 U.S.C. § 1115(a) (2018). The symbol "™" indicates an unregistered trademark over which the owner asserts common law ownership.

The Board prefers to retain trademark symbols together with the registered or asserted name to continue the assertion of ownership. thus, the board added the registered trademark symbol to "m-ColiBlue24®."[117] The Board also did not follow USEPA's lead and remove the registered trademark symbol from "Colilert®" and change the registered mark "Colisure®" to "Colisure™"[118] to correspond with present USEPA amendments.[119]

Updating C.F.R and U.S.C. Incorporations by Reference and Removing Unnecessary Dates. As a routine matter, the Board updates incorporations by reference to the *Code of Federal Regulations* to the latest version available. The latest version of the *Code of Federal Regulations* is the 2019 version.

While necessary for incorporation by reference (1 ILCS 100/5-75 (2019)), nothing other than practical considerations require a date for a citation to the *Code of Federal Regulations* or the *United States Code* in explanatory material. If a citation related to no specific version, no date is necessary. In fact, including a date could imply that including a date excludes later versions.

The Board removes the version dates from citations to the *Code of Federal Regulations* and *United States Code* in statements of derivation and explanatory statements. The only dates remaining are required for incorporations by reference or practical considerations.

Removing Explanations of USEPA Expedited Methods Approvals. The Board is removing explanations of USEPA summary approvals of ATPs from the Illinois rules. The Board no longer believes the explanations are necessary.

Section 1401(1) of SDWA (42 U.S.C. § 300f) allows USEPA to summarily approve ATPs, bypassing rulemaking procedure where the method is equally effective as one already approved by rule. Section 1401(1) requires *Federal Register* notice of the summary approvals, but not codification. The ordinary authority for establishing NPDWRs by rulemaking is section 1412(b) of SDWA (35 Ill. Adm. Code 300g-1(b)). Although section 1401(1) is not literally within the Board's IIS mandate,[120] ATPs are within the ambit of the mandate because they implement and are part of the NPDWRs adopted by USEPA pursuant to section 1412(b) of SDWA (42 U.S.C. § 300g-1(b)).

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[117] In 35 Ill. Adm. Code 611.102(a), entries for SM Methods, "SM 9222 J (15)" and Hach Methods, "Hach 10029 (99) (m-ColiBlue24®)", and 611.802(c)(2)(B)(i).

[118] In 35 Ill. Adm. Code 611.802(c)(2)(A)(i) and (c)(2)(A)(ii) (*E. coli*, Colilert® and Colisure®).

[119] In appendix A to subpart C of 40 C.F.R. 141 (2019) (table for 40 C.F.R. § 141.402(c)(2)

[120] Section 17.5 of the Act cites sections 1412(b), 1414(c), 1417(a), and 1445(a) of SDWA (42 U.S.C. §§ 300g-1(a), 300g-3(c), 300g-5(a), and 300j-4(a)), which provide for NPDWRs; public notice requirements; prohibition against lead pipes, solder, and flux; and unregulated contaminants monitoring requirements, respectively. 415 ILCS 5/17.5 (2018).

When USEPA approved the first ATPs in 2008, USEPA added lists of the ATPs separately from methods approved by rule. 73 Fed. Reg. 31616 (June 3, 2008). USEPA added the ATPs in appendix A of subpart C of 40 C.F.R. 141. USEPA did not add the ATPs in its substantive monitoring requirements. This was likely due to the distinct authority for USEPA approving ATPs. *See* 72 Fed. Reg. 17902, 17904 (Apr. 10, 2007) (proposing the initial ATPs).

Beginning with the first incorporation of approved alternative methods in SDWA Update, USEPA Amendments (January 1, 2007 through June 30, 2007 and June 3, 2008), R08-7, SDWA Update, USEPA Amendments (July 1, 2007 through December 31, 2007), R08-13 (Dec. 18, 2008) (consol.), the Board added the alternative methods in the substantive monitoring provisions. Prompted by the then-extraordinary nature of the summary approvals and USEPA's adding ATPs in tables apart from conventionally approved methods, the Board added explanations of USEPA's summary approvals in Board notes.

The only difference between ATPs and methods approved by rulemaking is that USEPA could use the summary procedure to withdraw ATPs. USEPA will not use the summary procedure to withdraw methods approved by rule. 72 Fed. Reg. at 17905. That is not a distinction with a difference under the Illinois regulatory scheme. The Board will remove methods from the Illinois rules under the same authority—the IIS mandate—no matter how USEPA removes the methods. Further, USEPA intends that states incorporate ATPs and methods approved by rule into their programs in the same way.

PUBLIC COMMENTS

The Board requests comments on the proposed amendments. The Board specifically requests comment on whether the proposed amendments ensure that Illinois' primary drinking water regulations remain consistent with the NPDWRs.

The Board will receive public comments on this proposal for at least 45 days following its publication in the *Illinois Register*. After that time, the Board will immediately consider adopting final amendments, making any necessary changes made evident through the public comments. The Board expects to file any adopted rules with the Secretary of State immediately after adoption, likely by March 16, 2020, but no later than March 31, 2020.

During development of the proposal for public comment, the Board received communications considered in the development. The Board added the following documents to the record as public comments:

PC 1 E-mail exchange dated November 8, 2018 and November 13, 2018 between Board and Standard Methods Organization staff identifying versions of methods in *Standard Methods*, 23rd edition.

PC 2 E-mail exchange dated March 12, 1919 and March 13, 1919 between Board and Standard Methods Organization staff clarifying approval dates for methods in *Standard Methods* editions.

PC 3 E-mail exchange dated May 2, 2019 between Board and IDEXX Water staff obtaining the USEPA-approved version of the SimPlate method.

PC 4 Letter dated August 19, 2019 from JCAR identifying corrections made or needed in the final text of the R18-17 amendments.

ORDER

The Board directs the Clerk to append to provide notice in the *Illinois Register* of the appended proposed amendments to the Illinois Primary Drinking Water Regulations.

I, Don A. Brown, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on December 19, 2019, by a vote of 4-0.

Don A. Brown

Don A. Brown, Clerk
Illinois Pollution Control Board

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE F: PUBLIC WATER SUPPLIES
CHAPTER I: POLLUTION CONTROL BOARD

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PRIMARY DRINKING WATER STANDARDS

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AUTHORITY: Implementing Sections 7.2, 17, and 17.5 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/7.2, 17, 17.5, and 27].

SOURCE: Adopted in R88-26 at 14 Ill. Reg. 16517, effective September 20, 1990; amended in R90-21 at 14 Ill. Reg. 20448, effective December 11, 1990; amended in R90-13 at 15 Ill. Reg. 1562, effective January 22, 1991; amended in R91-3 at 16 Ill. Reg. 19010, effective December 1, 1992; amended in R92-3 at 17 Ill. Reg. 7796, effective May 18, 1993; amended in R93-1 at 17 Ill. Reg. 12650, effective July 23, 1993; amended in R94-4 at 18 Ill. Reg. 12291, effective July 28, 1994; amended in R94-23 at 19 Ill. Reg. 8613, effective June 20, 1995; amended in R95-17 at 20 Ill. Reg. 14493, effective October 22, 1996; amended in R98-2 at 22 Ill. Reg. 5020, effective March 5, 1998; amended in R99-6 at 23 Ill. Reg. 2756, effective February 17, 1999; amended in R99-12 at 23 Ill. Reg. 10348, effective August 11, 1999; amended in R00-8 at 23 Ill. Reg. 14715, effective December 8, 1999; amended in R00-10 at 24 Ill. Reg. 14226, effective September 11, 2000; amended in R01-7 at 25 Ill. Reg. 1329, effective January 11, 2001; amended in R01-20 at 25 Ill. Reg. 13611, effective October 9, 2001; amended in R02-5 at 26 Ill. Reg. 3522, effective February 22, 2002; amended in R03-4 at 27 Ill. Reg. 1183, effective January 10, 2003; amended in R03-15 at 27 Ill. Reg. 16447, effective October 10, 2003; amended in R04-3 at 28 Ill. Reg. 5269, effective March 10, 2004; amended in R04-13 at 28 Ill. Reg. 12666, effective August 26, 2004; amended in R05-6 at 29 Ill. Reg. 2287, effective January 28, 2005; amended in R06-15 at 30 Ill. Reg. 17004, effective October 13, 2006; amended in R07-2/R07-11 at 31 Ill. Reg. 11757, effective July 27, 2007; amended in R08-7/R08-13 at 33 Ill. Reg. 633, effective December 30, 2008; amended in R10-1/R10-17/R11-6 at 34 Ill. Reg. 19848, effective December 7, 2010; amended in R12-4 at 36 Ill. Reg. 7110, effective April 25, 2012; amended in R13-2 at 37 Ill. Reg. 1978, effective February 4, 2013; amended in R14-8 at 38 Ill. Reg. 3608, effective January 27, 2014; amended in R14-9 at 38 Ill. Reg. 9792, effective April 21, 2014; amended in R15-6 at 39 Ill. Reg. 3713, effective February 24, 2015; amended in R15-23 at 39 Ill. Reg. 15144, effective November 9, 2015; amended in R16-4 at 39 Ill. Reg. 15352, effective November 13, 2015; amended in R17-12 at 42 Ill. Reg. 1140, effective January 4, 2018; amended R18-9 at 42 Ill. Reg. 9316, effective May 29, 2018; amended in R18-17 at 42 Ill. Reg. 8204, effective July 26, 2019; amended in R19-16 at 44 Ill. Reg. ________, effective ______________________.

SUBPART A: GENERAL

Section 611.101 Definitions

As used in this Part, the following terms have the given meanings:

"Act" means the Environmental Protection Act [415 ILCS 5].

"Agency" means the Illinois Environmental Protection Agency.
BOARD NOTE: The Department of Public Health (Public Health or DPH) regulates non-community water supplies ("non-CWSs", including non-transient, non-community water supplies ("NTNCWSs") and transient non-community water supplies ("transient non-CWSs")). "Agency" will mean Public Health where implementation by Public Health occurs with regard to non-CWS suppliers.

"Approved source of bottled water", for the purposes of Section 611.130(d)(4), means a source of water and the water therefrom, whether it be from a spring, artesian well, drilled well, municipal water supply, or any other source, that has been inspected and the water sampled, analyzed, and found to be a safe and sanitary quality according to applicable laws and regulations of State and local government agencies having jurisdiction, as evidenced by the presence in the plant of current certificates or notations of approval from each government agency or agencies having jurisdiction over the source, the water it bottles, and the distribution of the water in commerce.
BOARD NOTE: Derived from 40 CFR 142.62(g)(2) and 21 CFR 129.3(a)~~ (2016)~~. The Board cannot compile an exhaustive listing of all federal, State, and local laws to which bottled water and bottling water may be subjected. However, the statutes and regulations of which the Board is aware are the following: the Illinois Food, Drug and Cosmetic Act [410 ILCS 620], the Bottled Water Act [815 ILCS 310], the DPH Water Well Construction Code (77 Ill. Adm. Code 920), the DPH Water Well Pump Installation Code (77 Ill. Adm. Code 925), the federal bottled water quality standards (21 CFR 103.35), the federal drinking water processing and bottling standards (21 CFR 129), the federal Current Good Manufacturing Practice in Manufacturing, Packing, or Holding Human Food (21 CFR 110), the federal Fair Packaging and Labeling Act (15 USC 1451 et seq.), and the federal Fair Packaging and Labeling regulations (21 CFR 201).

"Bag filters" means pressure-driven separation devices that remove particulate matter larger than one micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.

"Bank filtration" means a water treatment process that uses a well to recover surface water that has naturally infiltrated into groundwater through a river bed or banks. Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other wells.

"Best available technology" or "BAT" means the best technology, treatment techniques, or other means that USEPA has found are available for the contaminant in question. BAT is specified in Subpart F.

"Bin classification" or "bin" means, for the purposes of Subpart Z, the appropriate of the four treatment categories (Bin 1, Bin 2, Bin 3, or Bin 4) that is assigned to a filtered system supplier under ~~pursuant to~~ Section 611.1010 based on the results of the source water Cryptosporidium monitoring described in the previous section. This bin classification determines the degree of additional Cryptosporidium treatment, if any, the filtered PWS must provide.
BOARD NOTE: Derived from 40 CFR 141.710 ~~(2016)~~ and the preamble discussion at 71 Fed. Reg. 654, 657 (Jan. 5, 2006).

"Board" means the Illinois Pollution Control Board.

"Cartridge filters" means pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

"CAS No." means "Chemical Abstracts Services Number".

"Clean compliance history" means, for the purposes of Subpart AA, a record of no MCL violations under Section 611.325; no monitoring violations under Subpart L or Subpart AA; and no coliform treatment technique trigger exceedances or treatment technique violations under Subpart AA.

"Coagulation" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

"Combined distribution system" means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

"Community water system" or "CWS" means a public water system (PWS) that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
BOARD NOTE: This definition differs slightly from that of Section 3.145 of the Act.

"Compliance cycle" means the nine-year calendar year cycle during which public water systems (PWSs) must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar cycle began January 1, 1993, and ended December 31, 2001; the second began January 1, 2002, and ended December 31, 2010; the third began January 1, 2011, and ends December 31, 2019.

“Compliance period” means a three-year calendar year period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period ran from January 1, 1993 to December 31, 1995; the second ran from January 1, 1996 to December 31, 1998; and the third ran from January 1, 1999 to December 31, 2001.

“Comprehensive performance evaluation” or “CPE” is a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation, and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements.
BOARD NOTE: The final sentence of the definition of “comprehensive performance evaluation” in 40 CFR 141.2 is codified as Section 611.160(a)(2), since it contains substantive elements that are more appropriately codified in a substantive provision.

“Confluent growth” means a continuous bacterial growth covering the entire filtration area of a membrane filter or a portion thereof, in which bacterial colonies are not discrete.

“Consecutive system” means a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

“Contaminant” means any physical, chemical, biological, or radiological substance or matter in water.

“Conventional filtration treatment” means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial “particulate removal~~.~~”.~~:~~

“CT” or “CT_{calc}” is the product of residual disinfectant concentration (RDC or C) in mg/ℓ determined before or at the first customer, and the corresponding disinfectant contact time (T) in minutes. If a supplier applies disinfectants at more than one point prior to the first customer, it must determine the CT of each disinfectant sequence before or at the first customer to determine the total percent inactivation or “total inactivation ratio”. In determining the total inactivation ratio, the supplier must determine the RDC of each disinfection sequence and corresponding contact time before any subsequent disinfection application points. (See the definition of “$\text{CT}_{99.9}$”.)

“$\text{CT}_{99.9}$” is the CT value required for 99.9 percent (3-log) inactivation of Giardia lamblia cysts. $\text{CT}_{99.9}$ values for a variety of disinfectants and conditions appear in Tables 1.1 through 1.6, 2.1, and 3.1 of Appendix B. (See the definition of “inactivation ratio”.)

BOARD NOTE: Derived from the definition of "CT" in 40 CFR 141.2~~ (2016)~~.

"Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which the following occur:

> A precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum); and
>
> While the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

"Direct filtration" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

"Disinfectant" means any oxidant, including chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

"Disinfectant contact time" or "T" means the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of RDC measurement to a point before or at the point where RDC is measured.

> Where only one RDC is measured, T is the time in minutes that it takes for water to move from the point of disinfectant application to a point before or at the point where RDC is measured.
>
> Where more than one RDC is measured, T is as follows:
>
> > For the first measurement of RDC, the time in minutes that it takes for water to move from the first or only point of disinfectant application to a point before or at the point where the first RDC is measured; and
> >
> > For subsequent measurements of RDC, the time in minutes that it takes for water to move from the previous RDC measurement point to the RDC measurement point for which the particular T is being calculated.
>
> T in pipelines must be calculated based on "plug flow" by dividing the internal volume of the pipe by the maximum hourly flow rate through that pipe.
>
> T within mixing basins and storage reservoirs must be determined by tracer studies or an equivalent demonstration.

"Disinfection" means a process that inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

“Disinfection byproduct” or “DBP” means a chemical byproduct that forms when disinfectants used for microbial control react with naturally occurring compounds already present in source water. DBPs include bromodichloromethane, bromoform, chloroform, dichloroacetic acid, bromate, chlorite, dibromochloromethane, and certain haloacetic acids.

“Disinfection profile” is a summary of daily Giardia lamblia inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in Section 611.742.

“Distribution system” includes all points downstream of an “entry point” to the point of consumer ownership.

“Domestic or other non-distribution system plumbing problem” means a coliform contamination problem in a PWS with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken.

“Dose equivalent” means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

“Dual sample set” means a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE under Subpart W and determining compliance with the TTHM and HAA5 MCLs under Subpart Y.

“E. coli” means Escherichia coli, a species of bacteria used as a specific indicator of fecal contamination and potential harmful pathogens.
BOARD NOTE: Derived from the discussion at 78 Fed. Reg. 10270, 10271 (Feb. 13, 2013).

“Enhanced coagulation” means the addition of sufficient coagulant for improved removal of disinfection byproduct (DBP) precursors by conventional filtration treatment.

“Enhanced softening” means the improved removal of disinfection byproduct (DBP) precursors by precipitative softening.

“Entry point” means a point just downstream of the final treatment operation, but upstream of the first user and upstream of any mixing with other water. If raw water is used without treatment, the “entry point” is the raw water source. If a PWS receives treated water from another PWS, the “entry point” is a point just downstream of the other PWS, but upstream of the first user on the receiving PWS, and upstream of any mixing with other water.

"Filter profile" is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

"Filtration" means a process for removing particulate matter from water by passage through porous media.

"Finished water" means water that is introduced into the distribution system of a public water system which is intended for distribution and consumption without further treatment, except that treatment which is necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals, etc.).

"Flocculation" means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

"Flowing stream" means a course of running water flowing in a definite channel.

"40/30 certification" means the certification, submitted by the supplier to the Agency under ~~pursuant to~~ Section 611.923, that the supplier had no TTHM or HAA5 monitoring violations, and that no individual sample from its system exceeded 0.040 mg/ℓ TTHM or 0.030 mg/ℓ HAA5 during eight consecutive calendar quarters.
BOARD NOTE: Derived from 40 CFR 141.603(a) ~~(2016)~~.

"GAC10" means granular activated carbon (GAC) filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 that is used as a best available technology for compliance with the MCLs set forth in Subpart Y under ~~pursuant to~~ Section 611.312(b)(2) is 120 days.

"GAC20" means granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

"GC" means "gas chromatography" or "gas-liquid phase chromatography".

"GC/MS" means gas chromatography (GC) followed by mass spectrometry (MS).

"Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

"Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

"Groundwater system" or "GWS" means a public water supply (PWS) that uses only groundwater sources, including a consecutive system that receives finished groundwater.
BOARD NOTE: Derived from 40 CFR 141.23(b)(2), 141.24(f)(2) note, and 40 CFR 141.400(b)~~ (2016)~~.

"Groundwater under the direct influence of surface water" means any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens, such as Giardia lamblia or Cryptosporidium, or significant and relatively rapid shifts in water characteristics, such as turbidity, temperature, conductivity, or pH, that closely correlate to climatological or surface water conditions. "Groundwater under the direct influence of surface water" is as determined in Section 611.212.

"Haloacetic acids (five)" or "HAA5" means the sum of the concentrations in milligrams per liter (mg/ℓ) of five haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

"Halogen" means one of the chemical elements chlorine, bromine, or iodine.

"HPC" means "heterotrophic plate count", measured as specified in Section 611.531(a)(2)(C).

"Hydrogeologic sensitivity assessment," for the purposes of Subpart S, means a determination of whether a GWS supplier obtains water from a hydrogeologically sensitive setting.
BOARD NOTE: Derived from 40 CFR 141.400(c)(5)~~ (2016)~~.

"Inactivation ratio" or "Ai" means as follows:

> $Ai = CT_{calc}/CT_{99.9}$
>
> The sum of the inactivation ratios, or "total inactivation ratio" (B), is calculated by adding together the inactivation ratio for each disinfection sequence as follows:
>
> $B = \sum(Ai)$
>
> A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3-log inactivation of Giardia lamblia cysts.

BOARD NOTE: Derived from the definition of "CT" in 40 CFR 141.2~~ (2016)~~.

"Initial compliance period" means the three-year compliance period that began January 1, 1993, except for the MCLs for dichloromethane, 1,2,4-trichlorobenzene, 1,1,2-trichloroethane, benzo(a)pyrene, dalapon, di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, dinoseb, diquat, endothall, endrin, glyphosate, hexachlorobenzene, hexachlorocyclopentadiene, oxamyl, picloram, simazine, 2,3,7,8-TCDD, antimony, beryllium, cyanide, nickel, and thallium, as they apply to a supplier whose system has fewer than 150 service connections, for which it means the three-year compliance period that began on January 1, 1996.

"Initial distribution system evaluation" or "IDSE" means the evaluation, performed by the supplier under ~~pursuant to~~ Section 611.921(c), to determine the locations in a distribution system that are representative of high TTHM and HAA5 concentrations throughout the distribution system. An IDSE is used in conjunction with, but is distinct from, the compliance monitoring undertaken to identify and select monitoring locations used to determine compliance with Subpart I.
BOARD NOTE: Derived from 40 CFR 141.601(c) ~~(2016)~~.

"Inorganic contaminants" or "IOCs" refers to that group of contaminants designated as such in United States Environmental Protection Agency (USEPA) regulatory discussions and guidance documents. IOCs include antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, mercury, nickel, nitrate, nitrite, selenium, and thallium.
BOARD NOTE: The IOCs are derived from 40 CFR 141.23(a)(4) ~~(2016)~~.

"ℓ" means "liter".

"Lake or reservoir" means a natural or man made basin or hollow on the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow.

"Legionella" means a genus of bacteria, some species of which have caused a type of pneumonia called Legionnaires Disease.

"Level 1 assessment" means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 1 assessment is conducted by the system operator or owner. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a groundwater system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The supplier must conduct the assessment consistent with any Agency-imposed permit conditions that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

"Level 2 assessment" means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system's monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. A Level 2 assessment is conducted by a person approved by a SEP granted by the Agency, and that person may include the system operator. Minimum elements include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a groundwater system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The supplier must conduct the assessment consistent with any Agency-imposed permit conditions that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system. The supplier must comply with any expedited actions or additional actions required by a SEP ~~granted by the Agency pursuant to Section 611.130~~ in the instance of an E. coli MCL violation.

"Locational running annual average" or "LRAA" means the average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

"Man-made beta particle and photon emitters" means all radionuclides emitting beta particles or photons listed in NBS Handbook 69 (63), incorporated by reference in Section 611.102, except the daughter products of thorium-232, uranium-235 and uranium-238.

"Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. (See Section 611.121.)

"Maximum contaminant level goal" or "MCLG" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MCLGs are nonenforceable health goals.
BOARD NOTE: The Board has not routinely adopted the regulations relating to the federal MCLGs because they are outside the scope of the Board's identical-in-substance mandate under Section 17.5 of the Act.

"Maximum residual disinfectant level" or "MRDL" means the maximum permissible level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs are enforceable in the same manner as are MCLs. (See Section 611.313 and Section 611.383.)

"Maximum residual disinfectant level goal" or "MRDLG" means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

"Maximum total trihalomethane potential" or "MTP" means the maximum concentration of total trihalomethanes (TTHMs) produced in a given water containing a disinfectant residual after seven days at a temperature of 25° C or above.

"Membrane filtration" means a pressure or vacuum driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

"MFL" means millions of fibers per liter larger than 10 micrometers.
BOARD NOTE: Derived from 40 CFR 141.23(a)(4)(i)~~ (2016)~~.

"mg" means milligrams (1/1000 of a gram).

"mg/ℓ" means milligrams per liter.

"Mixed system" means a PWS that uses both groundwater and surface water sources.
BOARD NOTE: Derived from 40 CFR 141.23(b)(2) and 141.24(f)(2) note~~ (2016)~~.

"MUG" means 4-methyl-umbelliferyl-beta-d-glucuronide.

"Near the first service connection" means at one of the 20 percent of all service connections in the entire system that are nearest the public water system (PWS) treatment facility, as measured by water transport time within the distribution system.

"nm" means nanometer (1/1,000,000,000 of a meter).

"Non-community water system" or "NCWS" or "non-CWS" means a public water system (PWS) that is not a community water system (CWS). A non-community water system is either a "transient non-community water system (TWS)" or a "non-transient non-community water system (NTNCWS)".

“Non-transient, non-community water system” or “non-transient, non-CWS” or “NTNCWS” means a public water system (PWS) that is not a community water system (CWS) and that regularly serves at least 25 of the same persons over six months per year.

“NPDWR” means “national primary drinking water regulation”.

“NTU” means “nephelometric turbidity units”.

“Old MCL” means one of the inorganic maximum contaminant levels (MCLs), codified at Section 611.300, or organic MCLs, codified at Section 611.310, including any marked as “additional State requirements”.
BOARD NOTE: Old MCLs are those derived prior to the implementation of the USEPA “Phase II” regulations. The Section 611.640 definition of this term, which applies only to Subpart O, differs from this definition in that the definition does not include the Section 611.300 inorganic MCLs.

“P-A Coliform Test” means “Presence-Absence Coliform Test”.

“Paired sample” means two samples of water for Total Organic Carbon (TOC). One sample is of raw water taken prior to any treatment. The other sample is taken after the point of combined filter effluent and is representative of the treated water. These samples are taken at the same time. (See Section 611.382.)

“Performance evaluation sample” or “PE sample” means a reference sample provided to a laboratory for the purpose of demonstrating that the laboratory can successfully analyze the sample within limits of performance specified by the Agency; or, for bacteriological laboratories, Public Health; or, for radiological laboratories, the Illinois Department of Nuclear Safety. The true value of the concentration of the reference material is unknown to the laboratory at the time of the analysis.

“Person” means an individual, corporation, company, association, partnership, state, unit of local government, or federal agency.

“Phase I” refers to that group of chemical contaminants and the accompanying regulations promulgated by USEPA on July 8, 1987, at 52 Fed. Reg. 25712.

“Phase II” refers to that group of chemical contaminants and the accompanying regulations promulgated by USEPA on January 30, 1991, at 56 Fed. Reg. 3578.

“Phase IIB” refers to that group of chemical contaminants and the accompanying regulations promulgated by USEPA on July 1, 1991, at 56 Fed. Reg. 30266.

“Phase V” refers to that group of chemical contaminants promulgated by USEPA on July 17, 1992, at 57 Fed. Reg. 31776.

“Picocurie” or “pCi” means the quantity of radioactive material producing 2.22 nuclear transformations per minute.

“Plant intake” means the works or structures at the head of a conduit through which water is diverted from a source (e.g., a river or lake) into the treatment plant.

“Point of disinfectant application” is the point at which the disinfectant is applied and downstream of which water is not subject to recontamination by surface water runoff.

“Point-of-entry treatment device” or “POE” is a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

“Point-of-use treatment device” or “POU” is a treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap.

“Presedimentation” means a preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

“Public Health” or “DPH” means the Illinois Department of Public Health.
BOARD NOTE: See the definition of “Agency” in this Section.

“Public water system” or “PWS” means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. A PWS is either a community water system (CWS) or a non-community water system (non-CWS). A PWS does not include any facility defined as “special irrigation district”. Such term includes the following:

> Any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and
>
> Any collection or pretreatment storage facilities not under such control that are used primarily in connection with such system.

BOARD NOTE: Where used in Subpart F, “public water supply” means the same as “public water system”.

“Radioactive contaminants” refers to that group of contaminants designated “radioactive contaminants” in USEPA regulatory discussions and guidance documents. “Radioactive contaminants” include tritium, strontium-89, strontium-90, iodine-131, cesium-134, gross beta emitters, and other nuclides.

BOARD NOTE: Derived from 40 CFR 141.25(c) Table B ~~(2016)~~. These radioactive contaminants must be reported in Consumer Confidence Reports under Subpart U when they are detected above the levels indicated in Section 611.720(c)(3).

"Reliably and consistently" below a specified level for a contaminant means an Agency determination based on analytical results following the initial detection of a contaminant to determine the qualitative condition of water from an individual sampling point or source. The Agency must base this determination on the consistency of analytical results, the degree below the MCL, the susceptibility of source water to variation, and other vulnerability factors pertinent to the contaminant detected that may influence the quality of water.
BOARD NOTE: Derived from 40 CFR 141.23(b)(9), 141.24(f)(11)(ii), and 141.24(f)(11)(iii) ~~(2016)~~.

"Rem" means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A "millirem (mrem)" is 1/1000 of a rem.

"Repeat compliance period" means a compliance period that begins after the initial compliance period.

"Representative" means that a sample must reflect the quality of water that is delivered to consumers under conditions when all sources required to supply water under normal conditions are in use and all treatment is properly operating.

"Residual disinfectant concentration" ("RDC" or "C" in CT calculations) means the concentration of disinfectant measured in mg/ℓ in a representative sample of water. For purposes of the requirement of Section 611.241(d) of maintaining a detectable RDC in the distribution system, "RDC" means a residual of free or combined chlorine.

"Safe Drinking Water Act" or "SDWA" means the Public Health Service Act, as amended by the Safe Drinking Water Act, Pub. L. 93-523, 42 USC 300f et seq.

"Sanitary defect" means a defect that could provide a pathway of entry for microbial contamination into the distribution system or which is indicative of a failure or imminent failure in a barrier to microbial contamination that is already in place.

"Sanitary survey" means an onsite review of the delineated WHPAs (identifying sources of contamination within the WHPAs and evaluations or the hydrogeologic sensitivity of the delineated WHPAs conducted under source water assessments or utilizing other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system (PWS) to evaluate the adequacy of the system, its sources, and operations for the production and distribution of safe drinking water.
BOARD NOTE: Derived from 40 CFR 141.2 and 40 CFR 142.16(o)(2) ~~(2016)~~.

“Seasonal system” means a non-CWS that is not operated as a PWS on a year-round basis and which starts up and shuts down at the beginning and end of each operating season.

“Sedimentation” means a process for removal of solids before filtration by gravity or separation.

“SEP” means special exception permit issued under 35 Ill. Adm. Code 602.600 ~~602.200~~.

“Service connection”, as used in the definition of public water system, does not include a connection to a system that delivers water by a constructed conveyance other than a pipe if any of the following is true:

> The water is used exclusively for purposes other than residential use (consisting of drinking, bathing, and cooking, or other similar uses);
>
> The Agency determines by issuing a SEP that alternative water for residential use or similar uses for drinking and cooking is provided to achieve the equivalent level of public health protection provided by the applicable national primary drinking water regulations; or
>
> The Agency determines by issuing a SEP that the water provided for residential use or similar uses for drinking, cooking, and bathing is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable national primary drinking water regulations.

BOARD NOTE: See sections 1401(4)(B)(i)(II) and (4)(B)(i)(III) of SDWA (42 USC 300f(4)(B)(i)(II) and (4)(B)(i)(III) ~~(2015)~~).

“Significant deficiency” means a deficiency identified by the Agency in a groundwater system under ~~pursuant to~~ Section 611.803. A significant deficiency might include a defect in system design, operation, or maintenance or a failure or malfunction of the sources, treatment, storage, or distribution system that the Agency determines to be causing or have potential for causing the introduction of contamination into the water delivered to consumers.
BOARD NOTE: Derived from 40 CFR 142.16(o)(2)(iv) (2016). The Agency must submit to USEPA a definition and description of at least one significant deficiency in each of the eight sanitary survey elements listed in Section 611.801(c) as part of the federal primacy requirements. The Board added the general description of what a significant deficiency might include in non-limiting terms, in order to provide this important definition within the body of the Illinois rules. No Agency submission to USEPA can provide definition within the context of Board regulations.

"Slow sand filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 meters per hour (m/h)) resulting in substantial particulate removal by physical and biological mechanisms.

"SOC" or "Synthetic organic chemical contaminant" refers to that group of contaminants designated as "SOCs", or "synthetic organic chemicals" or "synthetic organic contaminants", in USEPA regulatory discussions and guidance documents. "SOCs" include alachlor, aldicarb, aldicarb sulfone, aldicarb sulfoxide, atrazine, benzo(a)pyrene, carbofuran, chlordane, dalapon, dibromoethylene (ethylene dibromide or EDB), dibromochloropropane (DBCP), di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, dinoseb, diquat, endothall, endrin, glyphosate, heptachlor, heptachlor epoxide, hexachlorobenzene, hexachlorocyclopentadiene, lindane, methoxychlor, oxamyl, pentachlorophenol, picloram, simazine, toxaphene, poly-chlorinated biphenyls (PCBs), 2,4-D, 2,3,7,8-TCDD, and 2,4,5-TP.
BOARD NOTE: See the Board note appended to Section 611.311 for information relating to implementation of requirements relating to aldicarb, aldicarb sulfone, and aldicarb sulfoxide.

"Source" means a well, reservoir, or other source of raw water.

"Special irrigation district" means an irrigation district in existence prior to May 18, 1994 that provides primarily agricultural service through a piped water system with only incidental residential use or similar use, where the system or the residential users or similar users of the system comply with either of the following exclusion conditions:

> The Agency determines by issuing a SEP that alternative water is provided for residential use or similar uses for drinking or cooking to achieve the equivalent level of public health protection provided by the applicable national primary drinking water regulations; or
>
> The Agency determines by issuing a SEP that the water provided for residential use or similar uses for drinking, cooking, and bathing is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable national primary drinking water regulations.

BOARD NOTE: Derived from 40 CFR 141.2 ~~(2016)~~ and sections 1401(4)(B)(i)(II) and (4)(B)(i)(III) of SDWA (42 USC 300f(4)(B)(i)(II) and (4)(B)(i)(III) ~~(2015)~~).

"Standard monitoring" means the monitoring, performed by the supplier under ~~pursuant to~~ Section 611.921(a) and (b), at various specified locations in a distribution system including near entry points, at points that represent the average residence time in the distribution system, and at points in the distribution system that are representative of high TTHM and HAA5 concentrations throughout the distribution system.
BOARD NOTE: Derived from 40 CFR 141.601(a) and (b) ~~(2016)~~.

"Standard sample" means the aliquot of finished drinking water that is examined for the presence of coliform bacteria.

"Subpart B system" means a public water system that uses surface water or groundwater under the direct influence of surface water as a source and which is subject to the requirements of Subpart B and the analytical and monitoring requirements of Sections 611.531, 611.532, and 611.533~~,~~ Appendices ~~Appendix~~ B~~,~~ and ~~Appendix~~ C.

"Subpart I compliance monitoring" means monitoring required to demonstrate compliance with disinfectant residuals, disinfection byproducts, and disinfection byproduct precursors requirements of Subpart I.

"Subpart I system" means a public water system that uses surface water or groundwater as a source and which is subject to the disinfectant residuals, disinfection byproducts, and disinfection byproduct precursors requirements of Subpart I.

"Subpart Y compliance monitoring" means monitoring required to demonstrate compliance with Stage 2 disinfection byproducts requirements of Subpart Y.

"Supplier of water" or "supplier" means any person who owns or operates a public water system (PWS). This term includes the "official custodian".

"Surface water" means all water that is open to the atmosphere and subject to surface runoff.

"SUVA" means specific ultraviolet absorption at 254 nanometers (nm), which is an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV_{254}) (in m^{-1}) by its concentration of dissolved organic carbon (in mg/ℓ).

"SWS" means "surface water system", a public water supply (PWS) that uses only surface water sources, including "groundwater under the direct influence of surface water".
BOARD NOTE: Derived from 40 CFR 141.23(b)(2) and 141.24(f)(2) note ~~(2016)~~.

"System-specific study plan" means the plan, submitted by the supplier to the Agency under ~~pursuant to~~ Section 611.922, for studying the occurrence of TTHM and HAA5 in a supplier's distribution system based on either monitoring results or modelling of the system.
BOARD NOTE: Derived from 40 CFR 141.602 ~~(2016)~~.

"System with a single service connection" means a system that supplies drinking water to consumers via a single service line.

"Too numerous to count" means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

"Total organic carbon" or "TOC" means total organic carbon (in mg/ℓ) measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

"Total trihalomethanes" or "TTHM" means the sum of the concentration of trihalomethanes (THMs), in milligrams per liter (mg/ℓ), rounded to two significant figures.
BOARD NOTE: See the definition of "trihalomethanes" for a listing of the four compounds that USEPA considers TTHMs to comprise.

"Transient, non-community water system" or "transient non-CWS" means a non-CWS that does not regularly serve at least 25 of the same persons over six months of the year.
BOARD NOTE: The federal regulations apply to all "public water systems", which are defined as all systems that have at least 15 service connections or which regularly serve water to at least 25 persons. (See 42 USC 300f(4).) The Act mandates that the Board and the Agency regulate "public water supplies", which it defines as having at least 15 service connections or regularly serving 25 persons daily at least 60 days per year. (See Section 3.365 of the Act.) The Department of Public Health regulates transient, non-community water systems.

"Treatment" means any process that changes the physical, chemical, microbiological, or radiological properties of water, is under the control of the supplier, and is not a point-of-use treatment device or a point-of-entry treatment device as defined in this Section. Treatment includes aeration, coagulation, sedimentation, filtration, activated carbon treatment, disinfection, or ~~and~~ fluoridation.

"Trihalomethane" or "THM" means one of the family of organic compounds, named as derivatives of methane, in which three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure. The THMs are the following compounds:

Trichloromethane (chloroform),

Dibromochloromethane,

Bromodichloromethane, and

Tribromomethane (bromoform)

"Two-stage lime softening" means a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

"µg" means micrograms (1/1,000,000 of a gram).

"USEPA" means the U.S. Environmental Protection Agency.

"Uncovered finished water storage facility" is a tank, reservoir, or other facility that is used to store water which will undergo no further treatment to reduce microbial pathogens except residual disinfection and which is directly open to the atmosphere.

"Very small system waiver" means the conditional waiver from the requirements of Subpart W applicable to a supplier that serves fewer than 500 persons and which has taken TTHM and HAA5 samples under ~~pursuant to~~ Subpart I.
BOARD NOTE: Derived from 40 CFR 141.604 ~~(2016)~~.

"Virus" means a virus of fecal origin that is infectious to humans by waterborne transmission.

"VOC" or "volatile organic chemical contaminant" refers to that group of contaminants designated as "VOCs", "volatile organic chemicals", or "volatile organic contaminants", in USEPA regulatory discussions and guidance documents. "VOCs" include benzene, dichloromethane, tetrachloromethane (carbon tetrachloride), trichloroethylene, vinyl chloride, 1,1,1-trichloroethane (methyl chloroform), 1,1-dichloroethylene, 1,2-dichloroethane, cis-1,2-dichloroethylene, ethylbenzene, monochlorobenzene, o-dichlorobenzene, styrene, 1,2,4-trichlorobenzene, 1,1,2-trichloroethane, tetrachloroethylene, toluene, trans-1,2-dichloroethylene, xylene, and 1,2-dichloropropane.

"Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system (PWS) that is deficient in treatment, as determined by the appropriate local or State agency.

"Wellhead protection area" or "WHPA" means the surface and subsurface recharge area surrounding a community water supply well or well field, delineated outside of any applicable setback zones (under ~~pursuant to~~ Section 17.1 of the Act) under ~~pursuant to~~ Illinois' Wellhead Protection Program, through which contaminants are reasonably likely to move toward such well or well field.
BOARD NOTE: The Agency uses two guidance documents for identification of WHPAs:

> "Guidance Document for Groundwater Protection Needs Assessments", Illinois Environmental Protection Agency, Illinois State Water Survey, and Illinois State Geologic Survey joint report, January 1995; and
>
> "The Illinois Wellhead Protection Program under ~~pursuant to~~ Section 1428 of the Federal Safe Drinking Water Act", Illinois Environmental Protection Agency, No. 22480, October 1992.

"Wellhead protection program" means the wellhead protection program for the State of Illinois, approved by USEPA under section 1428 of the SDWA, 42 USC 300h-7. BOARD NOTE: Derived from 40 CFR 141.71(b) (2013). The wellhead protection program includes the "groundwater protection needs assessment" under Section 17.1 of the Act and 35 Ill. Adm. Code 615 through 617 ~~615-617~~.

"Wholesale system" means a public water system that treats source water as necessary to produce finished water, which then delivers some or all of that finished water to another public water system. Delivery by a wholesale system may be through a direct connection or through the distribution system of one or more consecutive systems.

BOARD NOTE: Derived from 40 CFR 141.2 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.102 Incorporations by Reference

a) Analytical Methods. The Board incorporates by reference the following analytical methods. The methods appear in the body of the rules by the defined short-form name indicated in this Section.

"AMI Turbiwell (09)" means "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter" (August 10, 2009). Available from SWAN Analytische Instrumente AG, Studbachstrasse 13, CH-8340, Hinwil, Switzerland. Referenced in Section 611.531. Available from the publisher; NEMI; and USEPA, OGWDW (under "Surface Water Treatment Rule (PDF)").

ASTM Methods. Available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 (610-832-9585 or www.astm.org/Standard/standards-and-publications).

"ASTM D511-93 A" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method A—Complexometric Titration", approved 1993, referenced in Section 611.611.

"ASTM D511-03 A" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method A—Complexometric Titration", approved 2003, referenced in Section 611.611.

"ASTM D511-09 A" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method A—Complexometric Titration", approved 2009, referenced in Section 611.611.

"ASTM D511-14 A" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method A—Complexometric Titration", approved 2014, referenced in Section 611.611.

"ASTM D511-93 B" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method B—Atomic Absorption Spectrophotometric", approved 1993, referenced in Section 611.611.

"ASTM D511-03 B" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method B—Atomic Absorption Spectrophotometric", approved 2003, referenced in Section 611.611.

"ASTM D511-09 B" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method B—Atomic Absorption Spectrophotometric", approved 2009, referenced in Section 611.611.

"ASTM D511-14 B" means "Standard Test Methods for Calcium and Magnesium in Water", "Test Method B—Atomic Absorption Spectrophotometric", approved 2014, referenced in Section 611.611.

"ASTM D515-88 A" means "Standard Test Methods for Phosphorus in Water", "Test Method A—Colorimetric Ascorbic Acid Reduction", approved August 19, 1988, referenced in Section 611.611.

"ASTM D859-94" means "Standard Test Method for Silica in Water", approved 1994, referenced in Section 611.611.

"ASTM D859-00" means "Standard Test Method for Silica in Water", approved 2000, referenced in Section 611.611.

"ASTM D859-05" means "Standard Test Method for Silica in Water", approved 2005, referenced in Section 611.611.

"ASTM D859-10" means "Standard Test Method for Silica in Water", approved 2010, referenced in Section 611.611.

"ASTM D859-16" means "Standard Test Method for Silica in Water", approved 2016, referenced in Section 611.611.

"ASTM D1067-92 B" means "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved May 15, 1992, referenced in Section 611.611.

"ASTM D1067-02 B" means "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-

Change Titration", approved in 2002, referenced in Section 611.611.

"ASTM D1067-06 B" means "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2006, referenced in Section 611.611.

"ASTM D1067-11 B" means "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2011, referenced in Section 611.611.

"ASTM D1067-16 B" means "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2006, referenced in Section 611.611.

"ASTM D1125-95(1999) A" means "Standard Test Methods for Electrical Conductivity and Resistivity of Water", "Test Method A—Field and Routine Laboratory Measurement of Static (Non-Flowing) Samples", approved 1995, reapproved 1999, referenced in Section 611.611.

"ASTM D1179-93 B" means "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 1993, referenced in Section 611.611.

"ASTM D1179-99 B" means "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 1999, referenced in Section 611.611.

"ASTM D1179-04 B" means "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 2004, referenced in Section 611.611.

"ASTM D1179-10 B" means "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 2010, referenced in Section 611.611.

"ASTM D1179-16 B" means "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 2010, referenced in Section 611.611.

"ASTM D1253-86" means "Standard Test Method for Residual Chlorine in Water", reapproved 1992, referenced in Section 611.381.

"ASTM D1253-96" means "Standard Test Method for Residual Chlorine in Water", approved 1996, referenced in Section 611.381.

"ASTM D1253-03" means "Standard Test Method for Residual Chlorine in Water", approved 2003, referenced in Sections 611.381 and 611.531.

"ASTM D1253-08" means "Standard Test Method for Residual Chlorine in Water", approved 2008, referenced in Sections 611.381 and 611.531.

"ASTM D1253-14" means "Standard Test Method for Residual Chlorine in Water", approved 2014, referenced in Sections 611.381 and 611.531.

"ASTM D1293-95" means "Standard Test Methods for pH of Water", approved 1995, referenced in Section 611.611.

"ASTM D1293-99" means "Standard Test Methods for pH of Water", approved 1999, referenced in Section 611.611.

"ASTM D1293-12" means "Standard Test Methods for pH of Water", approved 2012, referenced in Section 611.611.

"ASTM D1688-95 A" means "Standard Test Methods for Copper in Water", "Test Method A—Atomic Absorption, Direct", approved 1995, referenced in Section 611.611.

"ASTM D1688-02 A" means "Standard Test Methods for Copper in Water", "Test Method A—Atomic Absorption, Direct", approved 2002, referenced in Section 611.611.

"ASTM D1688-07 A" means "Standard Test Methods for Copper in Water", "Test Method A—Atomic Absorption, Direct", approved 2007, referenced in Section 611.611.

"ASTM D1688-12 A" means "Standard Test Methods for Copper in Water", "Test Method A—Atomic Absorption, Direct", approved 2012, referenced in Section 611.611.

"ASTM D1688-95 C" means "Standard Test Methods for Copper in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 1995, referenced in Section 611.611.

"ASTM D1688-02 C" means "Standard Test Methods for Copper in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 2002, referenced in Section 611.611.

"ASTM D1688-07 C" means "Standard Test Methods for Copper in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 2007, referenced in Section 611.611.

"ASTM D1688-12 C" means "Standard Test Methods for Copper in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 2012, referenced in Section 611.611.

"ASTM D2036-98 A" means "Standard Test Methods for Cyanide in Water", "Test Method A—Total Cyanides after Distillation", approved 1998, referenced in Section 611.611.

"ASTM D2036-06 A" means "Standard Test Methods for Cyanide in Water", "Test Method A—Total Cyanides after Distillation", approved 2006, referenced in Section 611.611.

"ASTM D2036-98 B" means "Standard Test Methods for Cyanide in Water", "Test Method B—Cyanides Amenable to Chlorination by Difference", approved 1998, referenced in Section 611.611.

"ASTM D2036-06 B" means "Standard Test Methods for Cyanide in Water", "Test Method B—Cyanides Amenable to Chlorination by Difference", approved 2006, referenced in Section 611.611.

"ASTM D2459-72" means "Standard Test Method for Gamma Spectrometry in Water", approved July 28, 1972, discontinued 1988, referenced in Section 611.720.

"ASTM D2460-97" means "Standard Test Method for Radionuclides of Radium in Water", approved 1997, referenced in Section 611.720.

"ASTM D2460-07" means "Standard Test Method for Radionuclides of Radium in Water", approved 2007, referenced in Section 611.720.

"ASTM D2907-97" means "Standard Test Methods for Microquantities of Uranium in Water by Fluorometry", approved 1997, referenced in Section 611.720.

"ASTM D2972-97 B" means "Standard Test Methods for Arsenic in Water", "Test Method B—Atomic Absorption, Hydride Generation", approved 1997, referenced in Section 611.611.

"ASTM D2972-03 B" means "Standard Test Methods for Arsenic in Water", "Test Method B—Atomic Absorption, Hydride Generation", approved 2003, referenced in Section 611.611.

"ASTM D2972-15 B" means "Standard Test Methods for Arsenic in Water", "Test Method B—Atomic Absorption, Hydride Generation", approved 2015, referenced in Section 611.611.

"ASTM D2972-97 C" means "Standard Test Methods for Arsenic in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 1997, referenced in Section 611.611.

"ASTM D2972-03 C" means "Standard Test Methods for Arsenic in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 2003, referenced in Section 611.611.

"ASTM D2972-15 C" means "Standard Test Methods for Arsenic in Water", "Test Method C—Atomic Absorption, Graphite Furnace", approved 2015, referenced in Section 611.611.

"ASTM D3223-97" means "Standard Test Method for Total Mercury in Water", approved 1997, referenced in Section 611.611.

"ASTM D3223-02" means "Standard Test Method for Total Mercury in Water", approved 2002, referenced in Section 611.611.

"ASTM D3223-12" means "Standard Test Method for Total Mercury in Water", approved 2012, referenced in Section 611.611.

"ASTM D3454-97" means "Standard Test Method for Radium-226 in Water", approved 1997, referenced in Section 611.720.

"ASTM D3454-05" means "Standard Test Method for Radium-226 in Water", approved 2005, referenced in Section 611.720.

"ASTM D3559-96 D" means "Standard Test Methods for Lead in Water", "Test Method D—Atomic Absorption, Graphite Furnace", approved August 6, 1990, referenced in Section 611.611.

"ASTM D3559-03 D" means "Standard Test Methods for Lead in Water", "Test Method D—Atomic Absorption, Graphite Furnace", approved 2003, referenced in Section 611.611.

"ASTM D3559-08 D" means "Standard Test Methods for Lead in Water", "Test Method D—Atomic Absorption, Graphite Furnace", approved 2008, referenced in Section 611.611.

"ASTM D3559-15 D" means "Standard Test Methods for Lead in Water", "Test Method D—Atomic Absorption, Graphite Furnace", approved 2015, referenced in Section 611.611.

“ASTM D3645-97 B” means “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 1997, referenced in Section 611.611.

“ASTM D3645-03 B” means “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.

“ASTM D3645-08 B” means “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.

“ASTM D3645-15 B” means “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.

“ASTM D3649-91” means “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 1991, referenced in Section 611.720.

“ASTM D3649-98a” means “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 1998, referenced in Section 611.720.

“ASTM D3649-06” means “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 2006, referenced in Section 611.720.

“ASTM D3697-92” means “Standard Test Method for Antimony in Water”, approved 1992, referenced in Section 611.611.

“ASTM D3697-02” means “Standard Test Method for Antimony in Water”, approved 2002, referenced in Section 611.611.

“ASTM D3697-07” means “Standard Test Method for Antimony in Water”, approved 2007, referenced in Section 611.611.

“ASTM D3697-12” means “Standard Test Method for Antimony in Water”, approved 2012, referenced in Section 611.611.

“ASTM D3859-98 A” means “Standard Test Methods for Selenium in Water”, “Method A—Atomic Absorption, Hydride Method”, approved 1998, referenced in Section 611.611.

“ASTM D3859-03 A” means “Standard Test Methods for Selenium in Water”, “Method A—Atomic Absorption, Hydride Method”, approved 2003, referenced in Section 611.611.

“ASTM D3859-08 A” means “Standard Test Methods for Selenium in Water”, “Method A—Atomic Absorption, Hydride Method”, approved 2008, referenced in Section 611.611.

“ASTM D3859-15 A” means “Standard Test Methods for Selenium in Water”, “Method A—Atomic Absorption, Hydride Method”, approved 2015, referenced in Section 611.611.

“ASTM D3859-98 B” means “Standard Test Methods for Selenium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 1998, referenced in Section 611.611.

“ASTM D3859-03 B” means “Standard Test Methods for Selenium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.

“ASTM D3859-08 B” means “Standard Test Methods for Selenium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.

“ASTM D3859-15 B” means “Standard Test Methods for Selenium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.

“ASTM D3867-90 A” means “Standard Test Methods for Nitrite-Nitrate in Water”, “Test Method A—Automated Cadmium Reduction”, approved 1990, referenced in Section 611.611.

“ASTM D3867-90 B” means “Standard Test Methods for Nitrite-Nitrate in Water”, “Test Method B—Manual Cadmium Reduction”, approved January 10, 1990, referenced in Section 611.611.

“ASTM D3972-97” means “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 1997, referenced in Section 611.720.

“ASTM D3972-02” means “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 2002, referenced in Section 611.720.

“ASTM D3972-09” means “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 2009, referenced in Section 611.720.

“ASTM D4107-91” means “Standard Test Method for Tritium in Drinking Water”, approved 1991, referenced in Section 611.720.

“ASTM D4107-98” means “Standard Test Method for Tritium in Drinking Water”, approved 1998, referenced in Section 611.720.

“ASTM D4107-08” means “Standard Test Method for Tritium in Drinking Water”, approved 2008, referenced in Section 611.720.

“ASTM D4327-97” means “Standard Test Method for Anions in Water by Ion Chromatography”, approved 1997, referenced in Section 611.611.

“ASTM D4327-03” means “Standard Test Method for Anions in Water by Ion Chromatography”, approved 2003, referenced in Section 611.611.

“ASTM D4327-11” means “Standard Test Method for Anions in Water by Ion Chromatography”, approved 2011, referenced in Section 611.611.

“ASTM D4785-93” means “Standard Test Method for Low-Level Iodine-131 in Water”, approved 1993, referenced in Section 611.720.

“ASTM D4785-00a” means “Standard Test Method for Low-Level Iodine-131 in Water”, approved 2000, referenced in Section 611.720.

“ASTM D4785-08” means “Standard Test Method for Low-Level Iodine-131 in Water”, approved 2008, referenced in Section 611.720.

“ASTM D5174-97” means “Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry”, approved 1997, referenced in Section 611.720.

“ASTM D5174-02” means “Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry”, approved 2002, referenced in Section 611.720.

“ASTM D5174-07” means “Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry”, approved 2007, referenced in Section 611.720.

“ASTM D5317-93” means “Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector”, approved 1993, referenced in Section 611.645.

"ASTM D5317-98(2003)" means "Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector", approved 1998 (reapproved 2003), referenced in Section 611.645.

"ASTM D5673-03" means "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2003, referenced in Section 611.720.

"ASTM D5673-05" means "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2005, referenced in Section 611.720.

"ASTM D5673-10" means "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2010, referenced in Section 611.720.

"ASTM D5673-16" means "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2016, referenced in Section 611.720.

"ASTM D6239-09" means "Standard Test Method for Uranium in Drinking Water by High-Resolution Alpha-Liquid-Scintillation Spectrometry", approved 2009, referenced in Section 611.720.

"ASTM D6508-00(2005)" means "Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte", approved 2000 (revised 2005), referenced in Section 611.611.

"ASTM D6508-15" means "Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte", approved 2015, referenced in Section 611.611.

"ASTM D6581-00" means "Standard Test Method for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Chemically Suppressed Ion Chromatography", approved 2000, referenced in Section 611.381.

"ASTM D6581-08 A" means "Standard Test Method for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed Ion Chromatography", "Test Method A—Chemically Suppressed Ion Chromatography", approved 2008, referenced in Section 611.381.

"ASTM D6581-08 B" means "Standard Test Method for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed

Ion Chromatography", "Test Method B—Electrolytically Suppressed Ion Chromatography", approved 2008, referenced in Section 611.381.

"ASTM D6888-04" means "Standard Test Method for Available Cyanide with Ligand Displacement and Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection", approved 2004, referenced in Section 611.611.

"ASTM D6919-03" means "Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography", approved 2003, referenced in Section 611.611.

"ASTM D6919-09" means "Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography", approved 2009, referenced in Section 611.611.

"ASTM D7283-17" means "Standard Test Method for Alpha and Beta Activity in Water by Liquid Scintillation Counting", approved 2017, referenced in Section 611.720.

"ATI Orion Technical Bulletin 601 (94)" means "Standard Method of Testing for Nitrate in Drinking Water" (July 1994), Part Number 221890-001. Available from Thermo-Fisher Scientific, 168 Third Ave, Waltham, MA 02451 (800-556-2323; www.thermofisher.com). Referenced in Section 611.611.

"Charm Fast Phage (12)" means "Fast Phage Test: Presence/Absence for Coliphage in Ground Water with Same Day Positive Prediction", ATP Case No. D09-0007, Version 009 (November 28, 2012). Available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843–1032. Referenced in Section 611.802 and USEPA, OGWDW (under "Ground Water Rule (PDF)").

"Chromocult® (00)" means "Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters", Version 1.0 (November 2000). Available from EMD Millipore (division of Merck KGgA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821 (800-645-5476 or 781-533-6000) and USEPA, OGWDW (under "Ground Water Rule (PDF)" and "Revised Totasl Coliforms Rules (PDF)"). Referenced in Sections 611.802 and 611.1052.

"E*Colite (98)" means "Alternative Test Procedure Case #D95-0007: Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water" (January 9, 1998). Available from Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843–1032 and USEPA, OGWDW (under "Ground Water Rule (PDF)" and "Revised Totasl Coliforms Rules (PDF)"). Referenced in Sections 611.802 and 611.1052.

EML Methods. Available from USEPA, OGWDW (listed under "Radionuclides (PDF)" by individual method numbers).

EML (90). In "EML Procedures Manual", HASL 300, Volumes 1 and 2, 27th ed. (November 1990).

"EML (90) Ga-01" means section 4.5.2.3, Ga-01, "Gamma Radioassay", in section 4.5.2.3, "Radiometrology", in 27th ed. Referenced in Section 611.720. USEPA, OGWDW lists EML (90) Ga-01 as "4.5.2.3".

"EML (90) Ra-05" means Ra-05, "Radium-226 in Tap Water, Urine, and Feces", in section 4.5.4, "Radiochemical", in 27th ed. Referenced in Section 611.720.

"EML (90) Sr-01" means Sr-01, "Strontium-89", in section 4.5.4, "Radiochemical", in 27th ed. Referenced in Section 611.720.

"EML (90) Sr-02" means Sr-02, "Strontium-90", in section 4.5.4, "Radiochemical", in 27th ed. Referenced in Section 611.720.

"EML (90) U-02" means U-02, "Isotopic Uranium in Biological and Environmental Materials", in section 4.5.4, "Radiochemical", in 27th ed.

"EML (90) U-04" means U-04, "Uranium in Biological and Environmental Materials", in section 4.5.4, "Radiochemical", in 27th ed. Referenced in Section 611.720.

EML (97). In "EML Procedures Manual", HASL 300, Volumes 1 and 2, 28th ed., Revision 0 (February 1997). Currently available on-line from United States Department of Homeland Security, Science and Technology Directorate (formerly United States Department of Energy, Environmental Measurements Laboratory) (www.hsdl.org/?abstract&doc=100185&coll=limited or www.wipp.energy.gov/namp/emllegacy/procman.htm).

"EML (97) Ga-01-R" means Ga-01-R, "Gamma Radioassay", in section 4.5.2, "Radiometrology", in 28th ed. Referenced in Section 611.720.

"EML (97) Ra-04" means Ra-04-RC, "Radium-226 in Tap Water, Urine, and Feces", in section 4.5.4, "Radiochemical", in 28th ed. Referenced in Section 611.720.

"EML (97) Sr-01" means Sr-01-RC, "Strontium-89", in section 4.5.4, "Radiochemical", in 28th ed. Referenced in Section 611.720.

"EML (97) Sr-02" means Sr-02-RC, "Strontium-90", in section 4.5.4, "Radiochemical", in 28th ed. Referenced in Section 611.720.

"EML (97) U-02" means U-02-RC, "Isotopic Uranium in Biological and Environmental Materials", in section 4.5.4, "Radiochemical", in 28th ed.

"EML (97) U-04" means U-04-RC, "Uranium in Biological and Environmental Materials", in section 4.5.4, "Radiochemical", in 28th ed. Referenced in Section 611.720.

"Enterolert (96)" means "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters", Applied and Environmental Microbiology, Oct. 1996, vol. 62, no. 10, p. 3881. Available from American Society for Microbiology, 1752 N Street N.W., Washington, DC 20036 (202-737-3600). Referenced in Section 611.802.

BOARD NOTE: At the table to 40 CFR 141.402(c)(2), USEPA approved the method as described in the above literature review. The method itself is embodied in the printed instructions to the proprietary kit available from IDEXX Laboratories, Inc. (accessible on-line and available by download from www.asm.org, as "Enterolert™ Procedure"). ASTM approved the method as "Standard Test Method for Enterococci in Water Using Enterolert™", which is available in two versions from ASTM: ASTM D6503-99 and ASTM D6503-99(2005). While it is more conventional to incorporate by reference the method as presented in the kit instructions or as approved by ASTM, the Board is constrained to incorporate by reference the version that USEPA has explicitly approved, which is the version that appears in the technical literature.

"Georgia Radium (04)" means "Method for the Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-ray Spectrometry Using HPGE or Ge(Li) Detectors", Revision 1.2 (December 2004). Available from Georgia Tech Research Institute, Robert Rosson, 925 Dalney Road, Atlanta, GA 30332 (404–407–6339) and USEPA, OGWDW (under “Radionuclides (PDF)”). Referenced in Section 611.720.

“GLI Method 2 (92)” means “Turbidity GLI Method 2” (November 2, 1992). Available from Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, WI 53223. Also available from USEPA, OGWDW (under “Surface Water Treatment Rule (PDF)”). Referenced in Section 611.531.

“Guidance Manual for Filtration and Disinfection (91)” means “Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources” (March 1991), EPA 570/3-91-001, USEPA, Office of Drinking Water, Criteria and Standards Division, Science and Technology Branch. Available from NTRL (document number PB93-222933) and USEPA, NSCEP (search “570391001”). Referenced in Sections 611.111 and 611.212.

Hach Methods. Available from Hach Company, P.O. Box 389, Loveland, CO 80539-0389 (800-227-4224 or www.hach.com).

> “Hach 8026 (15)” means Hach Method 8026, “Spectrophotometric Measurement of Copper in Finished Drinking Water”, Revision 1.2 (December 2015). Referenced in Section 611.611.
> BOARD NOTE: Also available from USEPA, OGWDW (under “Inorganic Contaminants and Other Inorganic Constituents (PDF)”).
>
> “Hach 8195 (18)” means Hach Method 8195, “Determination of Turbidity by Nephelometry”, Revision 3.0 (March 2018). Referenced in Section 611.531.
>
> “Hach 10029 (99) (m-ColiBlue24®)” means m-ColiBlue24® Test, Method No. 10029, “Total Coliforms and E. coli Membrane Filtration Method with m-ColiBlue24® Broth”, Revision 2 (August 17, 1999), document number DOC316.53.001213. Referenced in Sections 611.802 and 611.1052.
> BOARD NOTE: Also available from USEPA, OGWDW (under “Ground Water Rule (PDF)”).
>
> “Hach 10133 (00) (FilterTrak)” means Hach FilterTrak Method 10133, “Determination of Turbidity by Laser Nephelometry”, Revision 2.0 (January 7, 2000) in Appendix A of “Introduction to Laser Nephelometry: An Alternative to Conventional Particulate Analysis Methods”. Referenced in Section 611.531.
> BOARD NOTE: Also available from USEPA, OGWDW (under “Surface Water Treatment Rule (PDF)”).
>
> “Hach 10206 (11) (TNTplus 835/836)” means Hach TNTplus 835/836 Method 10206, “Spectrophotometric Measurement of

Nitrate in Water and Wastewater", Revision 2.0 (January 2011). Referenced in Section 611.611.
BOARD NOTE: Also available from USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

"Hach 10225 (11) (SPADNS 2)" means Hach SPADNS 2 Method 10225, "Fluoride, USEPA SPADNS 2 Method 10225", Revision 2.0 (January 2011). Referenced in Section 611.611.
BOARD NOTE: Also available from USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

"Hach 10241 (15)" means Hach Method 10241, "Spectrophotometric Measurement of Free Chlorine (Cl2) in Finished Drinking Water", Revision 1.2 (November 2015). Referenced in Sections 611.381 and 611.531.
BOARD NOTE: Also available from USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

"Hach 10258 (16)" means Hach Method 10258, "Determination of Turbidity by 360° Nephelometry", Revision 1.0 (January 2016). Referenced in Section 611.531.
BOARD NOTE: Also available from USEPA, OGWDW (under "Surface Water Treatment Rule (PDF)").

"Hach 10258 (18)" means Hach Method 10258, "Determination of Turbidity by 360° Nephelometry", Revision 2.0 (March 2018). Referenced in Section 611.531.

"Hach 10260 (13)" means Hach Method 10260, "Determination of Chlorinated Oxidants (Free and Total) in Water Using Disposable Planar Reagent-filled Cuvettes and Mesofluic Channel Colorimetry" (April 2013). Referenced in Sections 611.381 and 611.531.
BOARD NOTE: Also available from USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

"Hach 10261 (15)" means Hach Method 10261, "Total Organic Carbon in Finished Drinking Water by Catalyzed Ozone Hydroxyl Radical Oxidation Infrared Analysis", Revision 1.2 (December 2015). Referenced in Section 611.381.
BOARD NOTE: Also available from USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

"Hach 10267 (15)" means Hach Method 10267, "Spectrophotometric Measurement of Total Organic Carbon

(TOC) in Finished Drinking Water", Revision 1.2 (December 2015). Referenced in Section 611.381.
BOARD NOTE: Also available from USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

"Hach 10272 (15)" means Hach Method 10272, "Spectrophotometric Measurement of Copper in Finished Drinking Water", Revision 1.2 (December 2015). Referenced in Section 611.611.
BOARD NOTE: Also available from USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

"ITS D99-003 (03)" means "Method # (D99-003): Free Chlorine Species ($HOCl^-$ and OCl^-) by Test Strip", Revision 3.0 (November 21, 2003). Available from Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730 (803-329-2999) and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Section 611.381.

"Kelada 01 (01)" means "Method Kelada-01: Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate", Revision 1.2 (August 2001), USEPA Office of Water, document number EPA 821/B–01-009. Available from NTRL (document number PB2001-108275) and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)"). Referenced in Section 611.611.

Lovibond Methods. Available from Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243 (800-922-5242, 941-758-6410, or www.lovibond.us) and USEPA, OGWDW (under "Surface Water Treatment Rule (PDF)").

"Lovibond PTV 1000 (16)" means "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 1000 White Light LED Turbidimeter", Revision 1.0 (December 20, 2016). Referenced in Section 611.531.

"Lovibond PTV 2000 (16)" means "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter", Revision 1.0 (December 20, 2016). Referenced in Section 611.531.

"Lovibond PTV 6000 (16)" means "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter", Revision 1.0 (December 20, 2016). Referenced in Section 611.531.

"ME355.01 (09)" means "Determination of Cyanide in Drinking Water by GC/MS Headspace Analysis", Revision 1 (May 26, 2009). Available from H&E Testing Laboratory, 221 State Street, Augusta, ME 04333 (207-287-2727). Referenced in Section 611.611. Available from the publisher; NEMI; and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

Mitchell Methods. Available from Leck Mitchell, PhD, PE, 656 Independence Valley Dr., Grand Junction, CO 81507 (920-244-8661); , NEMI (except for Mitchell M5331 (16)); and USEPA, OGWDW (under "Surface Water Treatment Rule (PDF)").

"Mitchell M5271 (09)" means Mitchell Method M5271, "Determination of Turbidity by Laser Nephelometry", Revision 1.1 (March 5, 2009). Referenced in Section 611.531.

"Mitchell M5331 (09)" means Mitchell Method M5331, "Determination of Turbidity by Laser Nephelometry", Revision 1.1 (March 2009). Referenced in Section 611.531.

"Mitchell M5331 (16)" means Mitchell Method M5331, "Determination of Turbidity by Laser Nephelometry", Revision 1.2 (February 2016). Referenced in Section 611.531.

"Modified Colitag™ (09)" means "Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in Water", (ATP D05-0035) (August 28, 2009). Available from CPI International, Inc., 5580 Skylane Blvd., Santa Rosa, CA 95403 (800-878-7654; www.cpiinternational.com); NEMI; and USEPA, OGWDW (under "Ground Water Rule (PDF)" and "Revised Totasl Coliforms Rules (PDF)"). Referenced in Sections 611.802 and 611.1052.

"NBS Handbook 69 (63)" means "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure" (August 1963), U.S. Department of Commerce, National Bureau of Standards. Available from International Atomic Energy Agency (IAEA), Vienna International Centre, PO Box 100, 1400 Vienna, Austria, ((+43-1) 2600-0; www.iaea.org////Public/ /048/37048205.pdf) or Oak Ridge Associated Universities (ORAU), MC100-44, PO Box 117, Oak Ridge, TN 37831-0117 (865-576-3146). Referenced in Sections 611.101 and 611.330.
BOARD NOTE: The 1963 version of National Bureau of Standards Handbook 69 modifies the 1959 publication of the National Committee on Radiation Protection, NCRP Report No. 22, of the same title. The version available on the NCRP website is the 1959 document.

"NECi Nitrate Reductase (06)" means "Method for Nitrate Reductase Nitrate-Nitrogen Analysis of Drinking Water", Version 1.0, Revision 2.0 (February 1, 2016). Available from Superior Enzymes Inc., 334 Hecla

Street, Lake Linden, Michigan 49945 (906-296-1115). Also available from USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)"). Referenced in Section 611.611.

"New Jersey Radium (90)" means "Determination of Ra-228 in Drinking Water" (August 1990), New Jersey Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services. Available from publisher, 9 Ewing Street, Trenton, NJ 08625. Referenced in Section 611.720.

"New York Radium (82)" means "Determination of ^{226}Ra and ^{228}Ra, Ra-02" (January 1980, revised June 1982), Radiological Sciences Institute, Center for Laboratories and Research, New York State Department of Health. Available from publisher, Empire State Plaza, Albany, NY 12201. Referenced in Section 611.720.

"OIA-1677 (04)" means "Method OIA-1677 DW, Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry" (January 2004), document number EPA 821/R-04/001. Referenced in Section 611.611. Available from ALPKEM, Division of OI Analytical, P.O. Box 9010, College Station, TX 77842-9010, telephone: 979-690-1711, Internet: www.oico.com; USEPA, NSCEP (search "821R04001"); and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

"Orion AQ4500 (09)" means "Determination of Turbidity by LED Nephelometry", Revision 5 (March 12, 2009). Available from Thermo-Fisher Scientific, 168 Third Ave, Waltham, MA 02451 (800-556-2323 or www.thermofisher.com); NEMI; and USEPA, OGWDW (under "Surface Water Treatment Rule (PDF)"). Referenced in Section 611.531.

Palintest Methods. Available from Palintest, Ltd., 1455 Jamike Avenue, Suite 100, Erlanger, KY (800-835-9629).

> "Palintest 1001 (99)" means "Method 1001: Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry", August 1999, referenced in Section 611.611.
> BOARD NOTE: Also available from USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").
>
> "Palintest ChlordioX Plus (13)" means "Chlorine Dioxide and Chlorite in Drinking Water by Amperometry using Disposable Sensors", November 2013, referenced in Sections 611.381 and 611.531.
> BOARD NOTE: Also available from USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

“Palintest ChloroSense (09)” means “Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense”, September 2009, referenced in Sections 611.381 and 611.531. BOARD NOTE: Also available from NEMI and USEPA, OGWDW (under “Disinfection Byproduct Rules (PDF)”).

“QuikChem 10-204-00-1-X (00)” means “Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis”, Revision 2.1 (November 30, 2000). Available from Lachat Instruments, 6645 W. Mill Rd., Milwaukee, WI 53218 (414–358–4200) and USEPA, OGWDW (under “Inorganic Contaminants and Other Inorganic Constituents (PDF)”). Referenced in Section 611.611.

“Readycult® (07)” means “Readycult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters”, Version 1.1 (January 2007). Available from EMD Millipore (division of Merck KGgA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821 (800-645-5476 or 781-533-6000) and USEPA, OGWDW (under “Ground Water Rule (PDF)” and “Revised Totasl Coliforms Rules (PDF)”). Referenced in Sections 611.802 and 611.1052.

“SimPlate (00)” means “IDEXX SimPlate™ HPC Test Method for Heterotrophs in Water” (November 29, 2000). Availlable from IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092 (800-321-0207). Referenced in Section 611.531.

SM Methods. Approved as the version in the indicated editions of “Standard Methods for the Examination of Water and Wastewater” Available from the American Public Health Association, 800 I Street NW, Washington, DC 20005, 202-777-2742, www.awwa.org/store; American Water Works Association, 6666 West Quincy Ave., Denver, CO 80235, 303-794-7711; Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314, 800-666-0206, www.wef.org; or Standard Methods Online, 800-633-4931, www.standardmethods.org.

BOARD NOTE: The Board does not separately list methods from Standard Methods Online that also appear in the same version in a printed edition. Use of the approved method in the version indicated from Standard Methods Online is acceptable.

“SM 302 (71)” means Method 302, “Gross Alpha and Gross Beta Radioactivity in Water (Total, Suspended, and Dissolved)”, only the version in the 13th edition. Referenced in Section 611.720.

“SM 303 (71)” means Method 303, “Total Radioactive Strontium and Strontium 90 in Water”, only the version in the 13th edition. Referenced in Section 611.720.

“SM 304 (71)” means Method 304, “Radium in Water by Precipitation”, only the version in the 13th edition. Referenced in Section 611.720.

“SM 305 (71)” means Method 305, “Radium 226 by Radon in Water (Soluble, Suspended, and Total)”, only the version in the 13th edition. Referenced in Section 611.720.

“SM 306 (71)” means Method 306, “Tritium in Water”, in “Standard Methods for the Examination of Water and Wastewater”, only the version in the 13th edition. Referenced in Section 611.720.

“SM 2130 B (88)” means Method 2130 B, “Turbidity”, “Nephelometric Method”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 2130 B (94)” means Method 2130 B, “Turbidity”, “Nephelometric Method”, only the version in the 19th and 20th editions. Referenced in Section 611.531.

“SM 2130 B (01)” means Method 2130 B, “Turbidity”, “Nephelometric Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.531.

“SM 2320 B (91)” means Method 2320 B, “Alkalinity”, “Titration Method”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 2320 B (97)” means Method 2320 B, “Alkalinity”, “Titration Method”, only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 2510 B (91)” means Method 2510 B, “Conductivity”, “Laboratory Method”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 2510 B (97)” means Method 2510 B, “Conductivity”, “Laboratory Method”, only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 2550 (88)” means Method 2550, “Temperature, Laboratory and Field Methods”, only the version in the 18th edition. Referenced in Section 611.611.

"SM 2550 (93)" means Method 2550, "Temperature, Laboratory and Field Methods", only the version in the 19th and 20th editions. Referenced in Section 611.611.

"SM 2550 (00)" means Method 2550, "Temperature, Laboratory and Field Methods", only the version in the 21st edition. Referenced in Section 611.611.

"SM 2550 (10)" means Method 2550, "Temperature, Laboratory and Field Methods", only the version in the 22nd and 23rd editions. Referenced in Section 611.611.

"SM 3111 B (89)" means Method 3111 B, "Metals by Flame Atomic Absorption Spectrometry", "Direct Air-Acetylene Flame Method", only the version in the 18th edition. Referenced in Sections 611.611 and 611.612.

"SM 3111 B (93)" means Method 3111 B, "Metals by Flame Atomic Absorption Spectrometry", "Direct Air-Acetylene Flame Method", only the version in the 19th edition. Referenced in Sections 611.611 and 611.612.

"SM 3111 B (99)" means Method 3111 B, "Metals by Flame Atomic Absorption Spectrometry", "Direct Air-Acetylene Flame Method". Referenced in Sections 611.611 and 611.612.

"SM 3111 D (89)" means Method 3111 D, "Metals by Flame Atomic Absorption Spectrometry", "Direct Nitrous Oxide-Acetylene Flame Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 3111 D (93)" means Method 3111 D, "Metals by Flame Atomic Absorption Spectrometry", "Direct Nitrous Oxide-Acetylene Flame Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 3111 D (99)" means Method 3111 D, "Metals by Flame Atomic Absorption Spectrometry", "Direct Nitrous Oxide-Acetylene Flame Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 3112 B (88)" means Method 3112 B, "Metals by Cold-Vapor Atomic Absorption Spectrometry", "Cold-Vapor Atomic Absorption Spectrometric Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 3112 B (93)" means Method 3112 B, "Metals by Cold-Vapor Atomic Absorption Spectrometry", "Cold-Vapor Atomic

Absorption Spectrometric Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 3112 B (99)" means Method 3112 B, "Metals by Cold-Vapor Atomic Absorption Spectrometry", "Cold-Vapor Atomic Absorption Spectrometric Method", only the version in the 21st edition. Referenced in Section 611.611.

"SM 3112 B (09)" means Method 3112 B, "Metals by Cold-Vapor Atomic Absorption Spectrometry", "Cold-Vapor Atomic Absorption Spectrometric Method", only the version in the 22nd and 23rd editions. Referenced in Section 611.611.

"SM 3113 B (89)" means Method 3113 B, "Metals by Electrothermal Atomic Absorption Spectrometry", "Electrothermal Atomic Absorption Spectrometric Method", only the version in the 18th edition. Referenced in Sections 611.611 and 611.612.

"SM 3113 B (93)" means Method 3113 B, "Metals by Electrothermal Atomic Absorption Spectrometry", "Electrothermal Atomic Absorption Spectrometric Method", only the version in the 19th edition. (The same version appears in the 20th edition but USEPA has not approved that edition.) Referenced in Sections 611.611 and 611.612.

"SM 3113 B (99)" means Method 3113 B, "Metals by Electrothermal Atomic Absorption Spectrometry", "Electrothermal Atomic Absorption Spectrometric Method", only the version in the 21st edition. Referenced in Sections 611.611 and 611.612.

"SM 3113 B (04)" means Method 3113 B, "Metals by Electrothermal Atomic Absorption Spectrometry", "Electrothermal Atomic Absorption Spectrometric Method", only the version from Standard Methods Online as Method 3113 B-04. Referenced in Sections 611.611 and 611.612.

"SM 3113 B (10)" means Method 3113 B, "Metals by Electrothermal Atomic Absorption Spectrometry", "Electrothermal Atomic Absorption Spectrometric Method", only the version in the 22nd and 23rd editions. Referenced in Sections 611.611 and 611.612.

"SM 3114 B (89)" means Method 3114 B, "Metals by Hydride Generation/Atomic Absorption Spectrometry", "Manual Hydride Generation/Atomic Absorption Spectrometric Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 3114 B (93)" means Method 3114 B, "Metals by Hydride

Generation/Atomic Absorption Spectrometry", "Manual Hydride Generation/Atomic Absorption Spectrometric Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 3114 B (97)" means Method 3114 B, "Metals by Hydride Generation/Atomic Absorption Spectrometry", "Manual Hydride Generation/Atomic Absorption Spectrometric Method", only the version in the 21st edition. (The same version appears in the 20th edition, but USEPA has not approved that edition.) Referenced in Section 611.611.

"SM 3114 B (09)" means Method 3114 B, "Metals by Hydride Generation/Atomic Absorption Spectrometry", "Manual Hydride Generation/Atomic Absorption Spectrometric Method", only the version in the 22nd and 23rd editions. Referenced in Section 611.611.

"SM 3120 B (89)" means Method 3120 B, "Metals by Plasma Emission Spectroscopy", "Inductively Coupled Plasma (ICP) Method", only the version in the 18th edition. Referenced in Sections 611.611 and 611.612.

"SM 3120 B (93)" means Method 3120 B, "Metals by Plasma Emission Spectroscopy", "Inductively Coupled Plasma (ICP) Method", only the version in the 19th and 20th editions. Referenced in Sections 611.611 and 611.612.

"SM 3120 B (99)" means Method 3120 B, "Metals by Plasma Emission Spectroscopy", "Inductively Coupled Plasma (ICP) Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.611 and 611.612.

"SM 3125 (97)" means Method 3125, "Metals by Inductively Coupled Plasma/Mass Spectrometry", only the version in the 20th and 21st editions. Referenced in Section 611.720.

"SM 3500-Ca B (97)" means Method 3500-Ca B, "Calcium", "EDTA Titrimetric Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 3500-Ca D (91)" means Method 3500-Ca D, "Calcium", "EDTA Titrimetric Method", only the version in the 18th and 19th editions. Referenced in Section 611.611.

"SM 3500-Mg B (97)" means Method 3500-Mg B, "Magnesium", "Calculation Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 3500-Mg E (90)” means Method 3500-Mg E, “Magnesium”, “Calculation Method”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 3500-Mg E (91)” means Method 3500-Mg E, “Magnesium”, “Calculation Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4110 B (90)” means Method 4110 B, “Determination of Anions by Ion Chromatography”, “Ion Chromatography with Chemical Suppression of Eluent Conductivity”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 4110 B (91)” means Method 4110 B, “Determination of Anions by Ion Chromatography”, “Ion Chromatography with Chemical Suppression of Eluent Conductivity”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4110 B (97)” means Method 4110 B, “Determination of Anions by Ion Chromatography”, “Ion Chromatography with Chemical Suppression of Eluent Conductivity”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4110 B (00)” means Method 4110 B, “Determination of Anions by Ion Chromatography”, “Ion Chromatography with Chemical Suppression of Eluent Conductivity”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 4500-Cl D (89)” means Method 4500-Cl D, “Chlorine (Residual)”, “Amperometric Titration Method”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 4500-Cl D (93)” means Method 4500-Cl D, “Chlorine (Residual)”, “Amperometric Titration Method”, only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-Cl D (00)” means Method 4500-Cl D, “Chlorine (Residual)”, “Amperometric Titration Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-Cl E (89)” means Method 4500-Cl E, “Chlorine (Residual)”, “Low-Level Amperometric Titration Method”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 4500-Cl E (93)” means Method 4500-Cl E, “Chlorine (Residual)”, “Low-Level Amperometric Titration Method”, only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl E (00)" means Method 4500-Cl E, "Chlorine (Residual)", "Low-Level Amperometric Titration Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl F (89)" means Method 4500-Cl F, "Chlorine (Residual)", "DPD Ferrous Titrimetric Method", only the version in the 18th edition. Referenced in Section 611.531.

"SM 4500-Cl F (93)" means Method 4500-Cl F, "Chlorine (Residual)", "DPD Ferrous Titrimetric Method", only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl F (00)" means Method 4500-Cl F, "Chlorine (Residual)", "DPD Ferrous Titrimetric Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl G (89)" means Method 4500-Cl G, "Chlorine (Residual)", "DPD Colorimetric Method", only the version in the 18th edition. Referenced in Section 611.531.

"SM 4500-Cl G (93)" means Method 4500-Cl G, "Chlorine (Residual)", "DPD Colorimetric Method", only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl G (00)" means Method 4500-Cl G, "Chlorine (Residual)", "DPD Colorimetric Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl H (89)" means Method 4500-Cl H, "Chlorine (Residual)", "Syringaldazine (FACTS) Method", only the version in the 18th edition. Referenced in Section 611.531.

"SM 4500-Cl H (93)" means Method 4500-Cl H, "Chlorine (Residual)", "Syringaldazine (FACTS) Method", only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

"SM 4500-Cl H (00)" means Method 4500-Cl H, "Chlorine (Residual)", "Syringaldazine (FACTS) Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections

611.381 and 611.531.

“SM 4500-Cl I (89)” means Method 4500-Cl I, “Chlorine (Residual)”, “Iodometric Electrode Method”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 4500-Cl I (93)” means Method 4500-Cl I, “Chlorine (Residual)”, “Iodometric Electrode Method”, only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-Cl I (00)” means Method 4500-Cl I, “Chlorine (Residual)”, “Iodometric Electrode Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-ClO_2 C (88)” means Method 4500-ClO_2 C, “Chlorine Dioxide”, “Amperometric Method I”, only the version in the 18th edition. Referenced in Sections 611.381 and 611.531.

“SM 4500-ClO_2 C (93)” means Method 4500-ClO_2 C, “Chlorine Dioxide”, “Amperometric Method I”, only the version in the 19th and 20th editions. Referenced in Section 611.531.

“SM 4500-ClO_2 C (00)” means Method 4500-ClO_2 C, “Chlorine Dioxide”, “Amperometric Method I”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.531.

“SM 4500-ClO_2 D (88)” means Method 4500-ClO_2 D, “Chlorine Dioxide”, “DPD Method”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 4500-ClO_2 D (93)” means Method 4500-ClO_2 D, “Chlorine Dioxide”, “DPD Method”, only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-ClO_2 D (00)” means Method 4500-ClO_2 D, “Chlorine Dioxide”, “DPD Method”, only the version in the 21st edition. Referenced in Section 611.381.

“SM 4500-ClO_2 E (88)” means Method 4500-ClO_2 E, “Chlorine Dioxide”, “Amperometric Method II (Proposed)”, only the version in the 18th edition. Referenced in Section 611.531.

“SM 4500-ClO_2 E (93)” means Method 4500-ClO_2 E, “Chlorine Dioxide”, “Amperometric Method II”, only the version in the 19th and 20th editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-ClO_2 E (00)” means Method 4500-ClO_2 E, “Chlorine Dioxide”, “Amperometric Method II”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Sections 611.381 and 611.531.

“SM 4500-CN^- C (90)” means Method 4500-CN^- C, “Cyanide”, “Total Cyanide after Distillation”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 4500-CN^- C (97)” means Method 4500-CN^- C, “Cyanide”, “Total Cyanide after Distillation”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-CN^- C (99)” means Method 4500-CN^- C, “Cyanide”, “Total Cyanide after Distillation”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

“SM 4500-CN^- C (16)” means Method 4500-CN^- C, “Cyanide”, “Total Cyanide after Distillation”, only the version in the 23rd edition. Referenced in Section 611.611.

“SM 4500-CN^- E (90)” means Method 4500-CN^- E, “Cyanide”, “Colorimetric Method”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 4500-CN^- E (97)” means Method 4500-CN^- E, “Cyanide”, “Colorimetric Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-CN^- E (99)” means Method 4500-CN^- E, “Cyanide”, “Colorimetric Method”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

“SM 4500-CN^- E (16)” means Method 4500-CN^- E, “Cyanide”, “Colorimetric Method”, only the version in the 23rd edition. Referenced in Section 611.611.

“SM 4500-CN^- F (90)” means Method 4500-CN^- F, “Cyanide”, “Cyanide-Selective Electrode Method”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 4500-CN^- F (97)” means Method 4500-CN^- F, “Cyanide”, “Cyanide-Selective Electrode Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-CN^- F (99)” means Method 4500-CN^- F, “Cyanide”, “Cyanide-Selective Electrode Method”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

"SM 4500-CN^- F (16)" means Method 4500-CN^- F, "Cyanide", "Cyanide-Ion Selective Electrode Method", only the version in the 23rd edition. Referenced in Section 611.611.

"SM 4500-CN^- G (90)" means Method 4500-CN^- G, "Cyanide", "Cyanides Amenable to Chlorination after Distillation", only the version in the 18th and 19th editions. Referenced in Section 611.611.

"SM 4500-CN^- G (97)" means Method 4500-CN^- G, "Cyanide", "Cyanides Amenable to Chlorination after Distillation", only the version in the 20th edition. Referenced in Section 611.611.

"SM 4500-CN^- G (99)" means Method 4500-CN^- G, "Cyanide", "Cyanides Amenable to Chlorination after Distillation", only the version in the 21st and 22nd editions. Referenced in Section 611.611.

"SM 4500-CN^- G (16)" means Method 4500-CN^- G, "Cyanide", "Cyanides Amenable to Chlorination after Distillation", only the version in the 23rd edition. Referenced in Section 611.611.

"SM 4500-F^- B (88)" means Method 4500-F^- B, "Fluoride", "Preliminary Distillation Step", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-F^- B (94)" means Method 4500-F^- B, "Fluoride", "Preliminary Distillation Step", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-F^- B (97)" means Method 4500-F^- B, "Fluoride", "Preliminary Distillation Step", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 4500-F^- C (88)" means Method 4500-F^- C, "Fluoride", "Ion-Selective Electrode Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-F^- C (94)" means Method 4500-F^- C, "Fluoride", "Ion-Selective Electrode Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-F^- C (97)" means Method 4500-F^- C, "Fluoride", "Ion-Selective Electrode Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 4500-F^- D (88)" means Method 4500-F^- D, "Fluoride", "SPADNS Method", only the version in the 18th edition.

Referenced in Section 611.611.

“SM 4500-F^- D (94)” means Method 4500-F^- D, “Fluoride”, “SPADNS Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4500-F^- D (97)” means Method 4500-F^- D, “Fluoride”, “SPADNS Method”, only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 4500-F^- E (88)” means Method 4500-F^- E, “Fluoride”, “Complexone Method”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 4500-F^- E (94)” means Method 4500-F^- E, “Fluoride”, “Complexone Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4500-F^- E (97)” means Method 4500-F^- E, “Fluoride”, “Complexone Method”, only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 4500-H^+ B (90)” means Method 4500-H^+ B, “pH Value”, “Electrometric Method”, only the version in the 18th and 19th editions. Referenced in Section 611.611.

“SM 4500-H^+ B (96)” means Method 4500-H^+ B, “pH Value”, “Electrometric Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-H^+ B (00)” means Method 4500-H^+ B, “pH Value”, “Electrometric Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

“SM 4500-NO_3^- D (88)” means Method 4500-NO_3^- D, “Nitrogen (Nitrate)”, “Nitrate Electrode Method”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- D (93)” means Method 4500-NO_3^- D, “Nitrogen (Nitrate)”, “Nitrate Electrode Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- D (97)” means Method 4500-NO_3^- D, “Nitrogen (Nitrate)”, “Nitrate Electrode Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- D (00)” means Method 4500-NO_3^- D, “Nitrogen (Nitrate)”, “Nitrate Electrode Method”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

“SM 4500-NO_3^- D (16)” means Method 4500-NO_3^- D, “Nitrogen (Nitrate)”, “Nitrate Electrode Method”, only the version in the 23rd edition. Referenced in Section 611.611.

“SM 4500-NO_3^- E (88)” means Method 4500-NO_3^- E, “Nitrogen (Nitrate)”, “Cadmium Reduction Method”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- E (93)” means Method 4500-NO_3^- E, “Nitrogen (Nitrate)”, “Cadmium Reduction Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- E (97)” means Method 4500-NO_3^- E, “Nitrogen (Nitrate)”, “Cadmium Reduction Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- E (00)” means Method 4500-NO_3^- E, “Nitrogen (Nitrate)”, “Cadmium Reduction Method”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

“SM 4500-NO_3^- E (16)” means Method 4500-NO_3^- E, “Nitrogen (Nitrate)”, “Cadmium Reduction Method”, only the version in the 23rd edition. Referenced in Section 611.611.

“SM 4500-NO_3^- F (88)” means Method 4500-NO_3^- F, “Nitrogen (Nitrate)”, “Automated Cadmium Reduction Method”, only the version in the 18th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- F (93)” means Method 4500-NO_3^- F, “Nitrogen (Nitrate)”, “Automated Cadmium Reduction Method”, only the version in the 19th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- F (97)” means Method 4500-NO_3^- F, “Nitrogen (Nitrate)”, “Automated Cadmium Reduction Method”, only the version in the 20th edition. Referenced in Section 611.611.

“SM 4500-NO_3^- F (00)” means Method 4500-NO_3^- F, “Nitrogen (Nitrate)”, “Automated Cadmium Reduction Method”, only the version in the 21st and 22nd editions. Referenced in Section 611.611.

“SM 4500-NO_3^- F (16)” means Method 4500-NO_3^- F, “Nitrogen (Nitrate)”, “Automated Cadmium Reduction Method”, only the version in the 23rd edition. Referenced in Section 611.611.

“SM 4500-NO_2^- B (88)” means Method 4500-NO_2^- B, “Nitrogen

(Nitrite)", "Colorimetric Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-NO_2^- B (93)" means Method 4500-NO_2^- B, "Nitrogen (Nitrite)", "Colorimetric Method", only the version in the 19th and 20th editions. Referenced in Section 611.611.

"SM 4500-NO_2^- B (00)" means Method 4500-NO_2^- B, "Nitrogen (Nitrite)", "Colorimetric Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 4500-O_3 B (88)" means Method 4500-O_3 B, "Ozone (Residual) (Proposed)", "Indigo Colorimetric Method", only the version in the 18th edition. Referenced in Section 611.531.

"SM 4500-O_3 B (93)" means Method 4500-O_3 B, "Ozone (Residual)", "Indigo Colorimetric Method", only the version in the 19th edition. Referenced in Section 611.531.

"SM 4500-O_3 B (97)" means Method 4500-O_3 B, "Ozone (Residual)", "Indigo Colorimetric Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.531.

"SM 4500-P E (88)" means Method 4500-P E, "Phosphorus", "Ascorbic Acid Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-P E (93)" means Method 4500-P E, "Phosphorus", "Ascorbic Acid Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-P E (97)" means Method 4500-P E, "Phosphorus", "Ascorbic Acid Method", only the version in the 20th edition. Referenced in Section 611.611.

"SM 4500-P E (99)" means Method 4500-P E, "Phosphorus", "Ascorbic Acid Method", only the version in the 21st and 22nd editions. Referenced in Section 611.611.

"SM 4500-P E (05)" means Method 4500-P E, "Phosphorus", "Ascorbic Acid Method", only the version in the 23rd edition. Referenced in Section 611.611.

"SM 4500-P F (88)" means Method 4500-P F, "Phosphorus", "Automated Ascorbic Acid Reduction Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-P F (93)" means Method 4500-P F, "Phosphorus", "Automated Ascorbic Acid Reduction Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-P F (97)" means Method 4500-P F, "Phosphorus", "Automated Ascorbic Acid Reduction Method", only the version in the 20th edition. Referenced in Section 611.611.

"SM 4500-P F (99)" means Method 4500-P F, "Phosphorus", "Automated Ascorbic Acid Reduction Method", only the version in the 21st and 22nd editions. Referenced in Section 611.611.

"SM 4500-P F (05)" means Method 4500-P F, "Phosphorus", "Automated Ascorbic Acid Reduction Method", only the version in the 23rd edition. Referenced in Section 611.611.

"SM 4500-Si D (88)" means Method 4500-Si D, "Silica", "Molybdosilicate Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-Si D (93)" means Method 4500-Si D, "Silica", "Molybdosilicate Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-Si E (88)" means Method 4500-Si E, "Silica", "Molybdosilicate Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-Si E (93)" means Method 4500-Si E, "Silica", "Molybdosilicate Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-Si F (88)" means Method 4500-Si F, "Silica", "Molybdosilicate Method", only the version in the 18th edition. Referenced in Section 611.611.

"SM 4500-Si F (93)" means Method 4500-Si F, "Silica", "Molybdosilicate Method", only the version in the 19th edition. Referenced in Section 611.611.

"SM 4500-SiO_2 C (97)" means Method 4500-SiO_2 C, "Silica", "Molybdosilicate Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 4500-SiO_2 D (97)" means Method 4500-SiO_2 D, "Silica", "Heteropoly Blue Method", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 4500-SiO_2 E (97)" means Method 4500-SiO_2 E, "Silica", "Automated Method for Molybdate-Reactive Silica", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.611.

"SM 5310 B (92)" means Method 5310 B, "Total Organic Carbon (TOC)", "Combustion-Infrared Method", only the version in the supplement to the 19th edition. Referenced in Section 611.381.

"SM 5310 B (96)" means Method 5310 B, "Total Organic Carbon (TOC)", "High-Temperature Combustion Method", only the version in the 20th edition. Referenced in Section 611.381.

"SM 5310 B (00)" means Method 5310 B, "Total Organic Carbon (TOC)", "High-Temperature Combustion Method", only the version in the 21st and 22nd editions. Referenced in Section 611.381.

"SM 5310 B (14)" means Method 5310 B, "Total Organic Carbon (TOC)", "High-Temperature Combustion Method", only the version in the 23rd edition. Referenced in Section 611.381.

"SM 5310 C (92)" means Method 5310 C, "Total Organic Carbon (TOC)", "Persulfate-Ultraviolet Oxidation Method", only the version in the supplement to the 19th edition. Referenced in Section 611.381.

"SM 5310 C (96)" means Method 5310 C, "Total Organic Carbon (TOC)", "Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method", only the version in the 20th edition. Referenced in Section 611.381.

"SM 5310 C (00)" means Method 5310 C, "Total Organic Carbon (TOC)", "Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method", only the version in the 21st and 22nd editions. Referenced in Section 611.381.

"SM 5310 C (14)" means Method 5310 C, "Total Organic Carbon (TOC)", "Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method", only the version in the 23rd edition. Referenced in Section 611.381.

"SM 5310 D (92)" means Method 5310 D, "Total Organic Carbon (TOC)", "Wet-Oxidation Method", only the version in the supplement to the 19th edition. Referenced in Section 611.381.

"SM 5310 D (96)" means Method 5310 D, "Total Organic Carbon (TOC)", "Wet-Oxidation Method", only the version in the 20th edition. Referenced in Section 611.381.

"SM 5310 D (00)" means Method 5310 D, "Total Organic Carbon (TOC)", "Wet-Oxidation Method", only the version in the 21st and 22nd editions. Referenced in Section 611.381.

"SM 5910 B (94)" means Method 5910 B, "UV-Absorbing Organic Constituents", "Ultraviolet Absorption Method", only the version in the 19th and 20th editions. Referenced in Section 611.381.

"SM 5910 B (00)" means Method 5910 B, "UV-Absorbing Organic Constituents", "Ultraviolet Absorption Method", only the version in the 21st edition. Referenced in Section 611.381.

"SM 5910 B (11)" means Method 5910 B, "UV-Absorbing Organic Constituents", "Ultraviolet Absorption Method", only the version in the 22nd edition. Referenced in Section 611.381.

"SM 5910 B (13)" means Method 5910 B, "UV-Absorbing Organic Constituents", "Ultraviolet Absorption Method", only the version in the 23rd edition. Referenced in Section 611.381.

"SM 6251 B (94)" means Method 6251 B, "Disinfection By-Products: Haloacetic Acids and Trichlorophenol", "Micro Liquid-Liquid Extraction Gas Chromatographic Method", only the version in the 19th, 20th, and 21st editions. Referenced in Section 611.381.

"SM 6251 B (07)" means Method 6251 B, "Disinfection By-Products: Haloacetic Acids and Trichlorophenol", "Micro Liquid-Liquid Extraction Gas Chromatographic Method", only the version in the 22nd and 23rd editions. Referenced in Section 611.381.

"SM 6610 (92)" means Method 6610, "Carbamate Pesticides (Proposed)", only the version in the supplement to the 18th edition and the 19th edition. Referenced in Section 611.645.

"SM 6610 (96)" means Method 6610, "Carbamate Pesticides", only the version in the 20th edition. Referenced in Section 611.645.

"SM 6610 B (99)" means Method 6610, "Carbamate Pesticides", "High-Performance Liquid Chromatographic Method", only the version in the 21st edition. Referenced in Section 611.645.

"SM 6610 B (04)" means Method 6610, "Carbamate Pesticides", "High-Performance Liquid Chromatographic Method", only the version in 22nd and 23rd editions. Referenced in Section 611.645.

"SM 6640 B (01)" means Method 6640 B, "Acidic Herbicide Compounds", "Micro Liquid-Liquid Extraction Gas Chromatographic Method", only the version in 21st edition. Referenced in Section 611.645.

"SM 6640 B (06)" means Method 6640 B, "Acidic Herbicide Compounds", "Micro Liquid-Liquid Extraction Gas Chromatographic Method", only the version in 22nd and 23rd editions. Referenced in Section 611.645.

"SM 6651 B (91)" means Method 6651 B, "Glyphosate Herbicide (Proposed)", "Liquid Chromatographic Post-Column Fluorescence Method", only the version in 18th edition, or "Glyphosate Herbicide", "Liquid Chromatographic Post-Column Fluorescence Method", in 19th edition. Referenced in Section 611.645.

"SM 6651 B (96)" means Method 6651 B, "Glyphosate Herbicide", "Liquid Chromatographic Post-Column Fluorescence Method", only the version in 20th edition. Referenced in Section 611.645.

"SM 6651 B (00)" means Method 6651 B, "Glyphosate Herbicide", "Liquid Chromatographic Post-Column Fluorescence Method", only the version in 21st edition. Referenced in Section 611.645.

"SM 6651 B (05)" means Method 6651 B, "Glyphosate Herbicide", "Liquid Chromatographic Post-Column Fluorescence Method", only the version in 22nd and 23rd editions. Referenced in Section 611.645.

"SM 7110 B (85)" means Method 7110 B, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Counting Method", only the version in 17th edition. Referenced in Section 611.720.

"SM 7110 B (91)" means Method 7110 B, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Evaporation Method for Gross Alpha-Beta", only the version in 18th and 19th editions. Referenced in Section 611.720.

"SM 7110 B (96)" means Method 7110 B, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Evaporation Method for Gross Alpha-Beta", only the version in 20th edition. Referenced in Section 611.720.

"SM 7110 B (00)" means Method 7110 B, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Evaporation Method for Gross Alpha-Beta", only the version in 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7110 C (91)" means Method 7110 C, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed)", only the version in 18th and 19th editions. Referenced in Section 611.720.

"SM 7110 C (96)" means Method 7110 C, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water", only the version in 20th edition. Referenced in Section 611.720.

"SM 7110 C (00)" means Method 7110 C, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water", only the version in 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7110 D (17)" means Method 7110 D, "Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved)", "Liquid Scintillation Spectroscopic Method for Gross Alpha-Beta Radioactivity in Drinking Water", only the version from Standard Methods Online as Method 7110 D-17. Referenced in Section 611.720.

"SM 7120 (94)" means Method 7120, "Gamma-Emitting Radionuclides", only the version in the 19th edition. Referenced in Section 611.720.

"SM 7120 (97)" means Method 7120, "Gamma-Emitting Radionuclides", only the version in the 20th, 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-Cs B (88)" means Method 7500-Cs B, "Radioactive Cesium", "Precipitation Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-Cs B (93)" means Method 7500-Cs B, "Radioactive Cesium", "Precipitation Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-Cs B (00)" means Method 7500-Cs B, "Radioactive Cesium", "Precipitation Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-I B (88)" means Method 7500-I B, "Radioactive Iodine", "Precipitation Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-I B (93)" means Method 7500-I B, "Radioactive Iodine", "Precipitation Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-I B (00)" means Method 7500-I B, "Radioactive Iodine", "Precipitation Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-I C (88)" means Method 7500-I C, "Radioactive Iodine", "Ion-Exchange Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-I C (93)" means Method 7500-I C, "Radioactive Iodine", "Ion-Exchange Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-I C (00)" means Method 7500-I C, "Radioactive Iodine", "Ion-Exchange Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-I D (88)" means Method 7500-I D, "Radioactive Iodine", "Distillation Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-I D (93)" means Method 7500-I D, "Radioactive Iodine", "Distillation Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-I D (00)" means Method 7500-I D, "Radioactive Iodine", "Distillation Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-Ra B (88)" means Method 7500-Ra B, "Radium", "Precipitation Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-Ra B (93)" means Method 7500-Ra B, "Radium", "Precipitation Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-Ra B (01)" means Method 7500-Ra B, "Radium", "Precipitation Method", only the version in the 21st, 22nd, and

23rd editions. Referenced in Section 611.720.

“SM 7500-Ra C (88)” means Method 7500-Ra C, “Radium”, “Emanation Method”, only the version in the 17th and 18th editions. Referenced in Section 611.720.

“SM 7500-Ra C (93)” means Method 7500-Ra C, “Radium”, “Emanation Method”, only the version in the 19th and 20th editions. Referenced in Section 611.720.

“SM 7500-Ra C (01)” means Method 7500-Ra C, “Radium”, “Emanation Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

“SM 7500-Ra D (88)” means Method 7500-Ra D, “Radium”, “Sequential Precipitation Method”, only the version in the 17th and 18th editions. Referenced in Section 611.720.

“SM 7500-Ra D (93)” means Method 7500-Ra D, “Radium”, “Sequential Precipitation Method”, only the version in the 19th and 20th editions. Referenced in Section 611.720.

“SM 7500-Ra D (01)” means Method 7500-Ra D, “Radium”, “Sequential Precipitation Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

“SM 7500-Ra E (01)” means Method 7500-Ra E, “Radium”, “Gamma Spectrometry Method”, only the version in the 22nd edition. Referenced in Section 611.720.

“SM 7500-Ra E (07)” means Method 7500-Ra E, “Radium”, “Gamma Spectrometry Method”, only the version in the 23rd edition. Referenced in Section 611.720.

“SM 7500-Sr B (88)” means Method 7500-Sr B, “Total Radioactive Strontium and Strontium 90”, “Precipitation Method”, only the version in the 17th and 18th editions. Referenced in Section 611.720.

“SM 7500-Sr B (93)” means Method 7500-Sr B, “Total Radioactive Strontium and Strontium 90”, “Precipitation Method”, only the version in the 19th and 20th editions. Referenced in Section 611.720.

“SM 7500-Sr B (01)” means Method 7500-Sr B, “Total Radioactive Strontium and Strontium 90”, “Precipitation Method”, only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-^{3}H B (88)" means Method 7500-^{3}H B, "Tritium", "Liquid Scintillation Spectrometric Method", only the version in the 17th and 18th editions. Referenced in Section 611.720.

"SM 7500-^{3}H B (93)" means Method 7500-^{3}H B, "Tritium", "Liquid Scintillation Spectrometric Method", only the version in the 19th and 20th editions. Referenced in Section 611.720.

"SM 7500-^{3}H B (00)" means Method 7500-^{3}H B, "Tritium", "Liquid Scintillation Spectrometric Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-U B (88)" means Method 7500-U B, "Uranium", "Radiochemical Method (Proposed)", only the version in the 17th edition. Referenced in Section 611.720.

"SM 7500-U B (91)" means only Method 7500-U B, "Uranium", "Radiochemical Method (Proposed)", the version in the 18th edition, and "Uranium", "Radiochemical Method", the version in the 19th edition. Referenced in Section 611.720.

"SM 7500-U B (96)" means Method 7500-U B, "Uranium", "Radiochemical Method", only the version in the 20th edition. Referenced in Section 611.720.

"SM 7500-U B (00)" means Method 7500-U B, "Uranium", "Radiochemical Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 7500-U C (88)" means Method 7500-U C, "Uranium", "Fluorometric Method (Proposed)", only the version in the 17th edition. Referenced in Section 611.720.

"SM 7500-U C (91)" means Method 7500-U C, "Uranium", "Isotopic Method (Proposed)", only the version in the 18th and 19th editions. Referenced in Section 611.720.

"SM 7500-U C (96)" means Method 7500-U C, "Uranium", "Isotopic Method", only the version in the 20th edition. Referenced in Section 611.720.

"SM 7500-U C (00)" means Method 7500-U C, "Uranium", "Isotopic Method", only the version in the 21st, 22nd, and 23rd editions. Referenced in Section 611.720.

"SM 9060 A (97)" means Method 9060 A, "Samples", "Collection", only the version in the 20th and 21st editions. Referenced in Section 611.1052.

"SM 9215 B (88)" means Method 9215 B, "Heterotrophic Plate Count", "Pour Plate Method", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9215 B (94)" means Method 9215 B, "Heterotrophic Plate Count", "Pour Plate Method", only the version in the 19th and 20th editions. Referenced in Section 611.531.

"SM 9215 B (00)" means Method 9215 B, "Heterotrophic Plate Count", "Pour Plate Method", only the version in the 21st edition. Referenced in Section 611.531.

"SM 9215 B (04)" means Method 9215 B, "Heterotrophic Plate Count", "Pour Plate Method", only the version in the 22nd edition. Referenced in Section 611.531.

"SM 9215 B (16)" means Method 9215 B, "Heterotrophic Plate Count", "Pour Plate Method", only the version in the 23rd edition. Referenced in Section 611.531.

"SM 9221 A (93)" means Method 9221 A, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Introduction", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9221 A (94)" means Method 9221 A, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Introduction", only the version in the 19th and 20th editions. Referenced in Section 611.531.

"SM 9221 A (99)" means Method 9221 A, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Introduction", only the version in the 21st edition. Referenced in Section 611.531.

"SM 9221 A (06)" means Method 9221 A, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Introduction", only the version in the 22nd edition. Referenced in Section 611.531.

"SM 9221 A (14)" means Method 9221 A, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Introduction", only the version in the 23rd edition. Referenced in Section 611.531.

"SM 9221 B (93)" means Method 9221 B, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Standard Total Coliform Fermentation Technique", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9221 B (94)" means Method 9221 B, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Standard Total Coliform Fermentation Technique", only the version in the 19th and 20th editions. Referenced in Sections 611.531 and 611.1052.

"SM 9221 B (99)" means Method 9221 B, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Standard Total Coliform Fermentation Technique", only the version in the 21st edition. Referenced in Sections 611.531 and 611.1052.

"SM 9221 B (06)" means Method 9221 B, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Standard Total Coliform Fermentation Technique", only the version in the 22nd edition. Referenced in Sections 611.531 and 611.1052.

"SM 9221 B (14)" means Method 9221 B, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Standard Total Coliform Fermentation Technique", only the version in the 23rd edition. Referenced in Sections 611.531 and 611.1052.

"SM 9221 C (93)" means Method 9221 C, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Estimation of Bacterial Density", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9221 C (94)" means Method 9221 C, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Estimation of Bacterial Density", only the version in the 19th and 20th editions. Referenced in Section 611.531.

"SM 9221 C (99)" means Method 9221 C, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Estimation of Bacterial Density", only the version in the 21st edition. Referenced in Section 611.531.

"SM 9221 C (06)" means Method 9221 C, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Estimation of Bacterial Density", only the version in the 22nd edition. Referenced in Section 611.531.

"SM 9221 C (14)" means Method 9221 C, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Estimation of Bacterial Density", only the version in the 23rd edition. Referenced in Section 611.531.

"SM 9221 D (94)" means Method 9221 D, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Presence-Absence (P-A) Coliform", only the version in the 20th edition. Referenced in Section 611.1052.

"SM 9221 D (99)" means Method 9221 D, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Presence-Absence (P-A) Coliform", only the version in the 21st edition. Referenced in Section 611.1052.

"SM 9221 D (14)" means Method 9221 D, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Presence-Absence (P-A) Coliform", only the version in the 23rd edition. Referenced in Section 611.1052.

"SM 9221 E (93)" means Method 9221 E, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Fecal Coliform Procedure", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9221 E (94)" means Method 9221 E, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Fecal Coliform Procedure", only the version in the 19th and 20th editions. Referenced in Section 611.531.

"SM 9221 E (99)" means Method 9221 E, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Fecal Coliform Procedure", only the version in the 21st edition. Referenced in Section 611.531.

"SM 9221 E (06)" means Method 9221 E, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Fecal Coliform Procedure", only the version in the 22nd edition. Referenced in Section 611.531.

"SM 9221 E (14)" means Method 9221 E, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Thermotolerant (Fecal) Coliform Procedure", only the version in the 23rd edition. Referenced in Section 611.531.

"SM 9221 F (94)" means Method 9221 F, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Escherichia Coli Procedure (Proposed)", only the version in the 20th edition. Referenced in Sections 611.802 and 611.1052.

"SM 9221 F (06)" means Method 9221 F, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Escherichia Coli Procedure Using Fluorogenic Substrate", only the version in the 22nd edition. Referenced in Sections 611.802 and 611.1052.

"SM 9221 F (14)" means Method 9221 F, "Multiple-Tube Fermentation Technique for Members of the Coliform Group", "Escherichia Coli Procedure Using Fluorogenic Substrate", only the version in the 23rd edition. Referenced in Sections 611.802 and 611.1052.

"SM 9222 A (91)" means Method 9222 A, "Membrane Filter Technique for Members of the Coliform Group", "Introduction", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9222 A (94)" means Method 9222 A, "Membrane Filter Technique for Members of the Coliform Group", "Introduction", only the version in the 19th edition. Referenced in Section 611.531.

"SM 9222 A (97)" means Method 9222 A, "Membrane Filter Technique for Members of the Coliform Group", "Introduction", only the version in the 20th and 21st editions. Referenced in Section 611.531.

"SM 9222 A (06)" means Method 9222 A, "Membrane Filter Technique for Members of the Coliform Group", "Introduction", only the version in the 22nd edition. Referenced in Section 611.531.

"SM 9222 A (15)" means Method 9222 A, "Membrane Filter Technique for Members of the Coliform Group", "Introduction", only the version in the 23rd edition. Referenced in Section 611.531.

"SM 9222 B (91)" means Method 9222 B, "Membrane Filter Technique for Members of the Coliform Group", "Standard Total Coliform Membrane Filter Procedure", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9222 B (94)" means Method 9222 B, "Membrane Filter Technique for Members of the Coliform Group", "Standard Total Coliform Membrane Filter Procedure", only the version in the 19th edition. Referenced in Section 611.531.

"SM 9222 B (97)" means Method 9222 B, "Membrane Filter

Technique for Members of the Coliform Group", "Standard Total Coliform Membrane Filter Procedure", only the version in the 20th and 21st editions. Referenced in Sections 611.531 and 611.1052.

"SM 9222 B (15)" means Method 9222 B, "Membrane Filter Technique for Members of the Coliform Group", "Standard Total Coliform Membrane Filter Procedure using Endo Media", only the version in the 23rd edition. Referenced in Sections 611.531 and 611.1052.

"SM 9222 C (91)" means Method 9222 C, "Membrane Filter Technique for Members of the Coliform Group", "Delayed-Incubation Total Coliform Procedure", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9222 C (94)" means Method 9222 C, "Membrane Filter Technique for Members of the Coliform Group", "Delayed-Incubation Total Coliform Procedure", only the version in the 19th edition. Referenced in Section 611.531.

"SM 9222 C (97)" means Method 9222 C, "Membrane Filter Technique for Members of the Coliform Group", "Delayed-Incubation Total Coliform Procedure", only the version in the 20th and 21st editions. Referenced in Sections 611.531 and 611.1052.

"SM 9222 C (15)" means Method 9222 C, "Membrane Filter Technique for Members of the Coliform Group", "Delayed-Incubation Total Coliform Procedure", only the version in the 23rd edition. Referenced in Sections 611.531 and 611.1052.

"SM 9222 D (91)" means Method 9222 D, "Membrane Filter Technique for Members of the Coliform Group", "Fecal Coliform Membrane Filter Procedure", only the version in the 18th edition. Referenced in Section 611.531.

"SM 9222 D (94)" means Method 9222 D, "Membrane Filter Technique for Members of the Coliform Group", "Fecal Coliform Membrane Filter Procedure", only the version in the 19th edition. Referenced in Section 611.531.

"SM 9222 D (97)" means Method 9222 D, "Membrane Filter Technique for Members of the Coliform Group", "Fecal Coliform Membrane Filter Procedure", only the version in the 20th and 21st editions. Referenced in Sections 611.531 and 611.1004.

"SM 9222 D (06)" means Method 9222 D, "Membrane Filter Technique for Members of the Coliform Group", "Thermotolerant (Fecal) Coliform Membrane Filter Procedure", only the version in the 22nd edition. Referenced in Section 611.531.

“SM 9222 D (15)” means Method 9222 D, “Membrane Filter Technique for Members of the Coliform Group”, “Thermotolerant (Fecal) Coliform Membrane Filter Procedure”, only the version in the 23rd edition. Referenced in Section 611.531.

“SM 9222 G (97)” means Method 9222 G, “Membrane Filter Technique for Members of the Coliform Group”, “MF Partition Procedure”, only the version in the 20th and 21st editions. Referenced in Sections 611.802, 611.1004, and 611.1052.

“SM 9222 H (15)” means Method 9222 H, “Membrane Filter Technique for Members of the Coliform Group”, “Partitioning E. coli from MF Total Coliform and E. coli using EC-MUG Broth”, only the version in the 23rd edition. Referenced in Section 611.1052.

“SM 9222 I (15)” means Method 9222 I, “Membrane Filter Technique for Members of the Coliform Group”, “Partitioning E. coli from MF Total Coliform and E. coli using NA-MUG Agar”, only the version in the 23rd edition. Referenced in Sections 611.802 and 611.1052.

“SM 9222 J (15)” means Method 9222 J, “Membrane Filter Technique for Members of the Coliform Group”, “Simultaneous Detection of Total Coliform and E. coli by Dual-Chromogen Membrane Filter Procedure”, only the version in the 23rd edition. Referenced in Sections 611.802 and 611.1052.

“SM 9223 (92)” means Method 9223, “Chromogenic Substrate Coliform Test (Proposed)” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 18th edition. Referenced in Section 611.531.

“SM 9223 (94)” means Method 9223, “Chromogenic Substrate Coliform” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 19th edition. Referenced in Section 611.531.

“SM 9223 (97)” means Method 9223, “Enzyme Substrate Coliform” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 20th and 21st editions. Referenced in Sections 611.531.

“SM 9223 B (92)” means Method 9223 B, “Chromogenic Substrate Coliform Test (Proposed)”, “Chromogenic Substrate”

<u>(also referred to as the variations “Colilert®”, “Colisure™”, and “Colilert-18®” depending on the medium used), only the version in the 18th edition. Referenced in Section 611.1004.</u>

<u>“SM 9223 B (94)” means Method 9223 B, “Chromogenic Substrate Coliform”, “Chromogenic Substrate” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 19th edition. Referenced in Section 611.1004.</u>

<u>“SM 9223 B (97)” means Method 9223 B, “Enzyme Substrate Coliform”, “Chromogenic Substrate” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 20th and 21st editions. Referenced in Sections 611.802 and 611.1004.</u>

<u>“SM 9223 B (04)” means Method 9223 B, “Enzyme Substrate Coliform”, “Enzyme Substrate” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 22nd edition. Referenced in Sections 611.531, 611.802, and 611.1004.</u>

<u>“SM 9223 B (16)” means Method 9223 B, “Enzyme Substrate Coliform”, “Enzyme Substrate” (also referred to as the variations “Colilert®” and “Colisure™” depending on the medium used), only the version in the 23rd edition. Referenced in Sections 611.531, 611.802, and 611.1052.</u>

<u>“SM 9230 B (93)” means Method 9230 B, “Fecal Streptococcus and Enterococcus Groups”, “Multiple-Tube Techniques”, only the version in the 20th and 21st editions. Referenced in Section 611.802.</u>

<u>“SM 9230 B (04)” means Method 9230 B, “Fecal Streptococcus and Enterococcus Groups”, “Multiple-Tube Techniques”, only the version from Standard Methods Online as Method 9230 B-04. Referenced in Section 611.802.</u>

<u>“SM 9230 C (93)” means Method 9230 C, “Fecal Streptococcus and Enterococcus Groups”, “Membrane Filter Techniques”, only the version in the 20th edition. Referenced in Section 611.802.</u>

<u>“SM 9230 C (13)” means Method 9230 C, “Fecal Enterococcus/Streptococcus Groups”, “Membrane Filter Techniques”, only the version in the 23rd edition. Referenced in Section 611.802.</u>

<u>“SM 9230 D (13)” means Method 9230 D, “Fecal</u>

Enterococcus/Streptococcus Groups", "Fluorogenic Substrate Enterococcus", only the version in the 23rd edition. Referenced in Section 611.802.

BOARD NOTE: The publication dates of the several editions of "Standard Methods for the Examination of Water and Wastewater" that contain approved methods are as follows:

13th edition, 1971
17th edition, 1989
18th edition, 1992
Supplement to 18th edition, 1994
19th edition, 1995
Supplement to 19th edition, 1996
20th edition, 1998
21st edition, 2005
22nd edition, 2012
23rd edition, 2017

"Syngenta AG-625 (01)" means "Method AG-625: Atrazine in Drinking Water by Immunoassay" (February 2001), Syngenta Crop Protection, Inc. Available from publisher, 410 Swing Road, Post Office Box 18300, Greensboro, NC 27419 (336-632–6000). Referenced in Section 611.645.

"Systea Easy (1-Reagent) (09)" means "Nitrate by Discrete Analysis: Systea Easy (1-Reagent) Nitrate Method (Colorimetric, Automated, 1 Reagent)" (February 4, 2009). Available from Systea Scientific LLC, 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523 (630-645-0600); NEMI; and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)"). Referenced in Section 611.611.

Technicon Methods. Available from Bran + Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.

"Technicon #129-71W (72)" means "Fluoride in Water and Wastewater" (December 1972), Industrial Method #129-71W. Referenced in Section 611.611. See 40 CFR 141.23(k)(1), footnote 11.

"Technicon #380-75WE (76)" means "Fluoride in Water and Wastewater" (February 1976), #380-75WE. See 40 CFR 141.23(k)(1), footnote 11, referenced in Section 611.611.

Tecta Methods. Available from Pathogen Detection Systems, Inc., 382 King Street, Kingston, Ontario, Canada K7K 2Y2 (844-215-7122 or www.tecta-pds.ca) and USEPA, OGWDW (under "Ground Water Rule (PDF)" and "Revised Totasl Coliforms Rules (PDF)").

“Tecta (14)” means “TECTA™ EC/TC medium and the TECTA™ Instrument: a Presence/Absence Method for Simultaneous Detection of Total Coliforms and Escherichia coli (E.coli) in Drinking Water”, Version 1.0 (May 22, 2014). Referenced in Sections 611.802 and 611.1052.

“Tecta (17)” means “TECTA™ EC/TC medium and the TECTA™ Instrument: a Presence/Absence Method for Simultaneous Detection of Total Coliforms and Escherichia coli (E.coli) in Drinking Water”, Version 2.0 (March 20, 2017). Referenced in Sections 611.802 and 611.1052.

“Thermo-Fisher 557.1 (17)” means “Thermofisher Method 557.1: Determination of Haloacetic Acids in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection”, Version 1.0 (January 2017). Available from Thermo-Fisher Scientific, 490 Lakewside Dr, Sunnyvale, CA 94085 (800-556-2323; www.thermofisher.com) and USEPA, OGWDW (under “Disinfection Byproduct Rules (PDF)”). Referenced in Section 611.611.

“Thermo-Fisher Discrete Analyzer (16)” means “Application Note: Drinking Water Orthophosphate Method for Thermo Scientific Gallery Discrete Analyzer”, Revision 5 (February 18, 2016). Available from Thermo-Fisher Scientific, Ratastie 2, 01620 Vantaa, Finland and USEPA, OGWDW (under “Inorganic Contaminants and Other Inorganic Constituents (PDF)”). Referenced in Section 611.611.

USEPA Methods

Numbered Methods

“USEPA H-02 (84)” means Method H-02, “Radiochemical Determination of Tritium in Water—Dioxane Method”, in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA Ra-03 (84)” means Method Ra-03, “Radiochemical Determination of Radium-226 in Water Samples”, in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA Ra-04 (84)” means Method Ra-04, “Radiochemical Determination of Radium-226—De-

emanation Procedure", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA Ra-05 (84)" means Method Ra-05, "Radiochemical Determination of Radium-228 in Water Samples", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA Sr-04 (84)" means Method Sr-04, "Radiochemical Determination of Radiostrontium in Water, Sea Water and Other Aqueous Media", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 00-01 (84)" means Method 00-01, "Radiochemical Determination of Gross Alpha and Gross Beta Activity in Water", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 00-02 (84)" means Method 00-02, "Radiochemical Determination of Gross Alpha Activity in Drinking Water by Coprecipitation", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 00-07 (84)" means Method 00-07, "Radiochemical Determination of Thorium and Uranium in Water", in USEPA Radiochemistry Procedures (84). Referenced in Section 611.720.
BOARD NOTE: Also available from USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 100.1 (83)" means "Method 100.1: Analytical Method for Determination of Asbestos in Water" (September 1983), USEPA, Environmental Research Laboratory, document number EPA 600/4-83-043. Available from NEMI; NTRL (document number PB83-

260471) and USEPA, NSCEP (search for “600483043”). Referenced in Section 611.611.

“USEPA 100.2 (94)” means “Method 100.2: Determination of Asbestos Structures over 10-mm in Length in Drinking Water” (June 1994), USEPA, Environmental Monitoring Systems Laboratory, document number EPA 600/R-94-134. Available from NEMI; NTRL (document number PB94-201902); USEPA, NSCEP (search for “600R94134”); and USEPA, OGWDW (under “Inorganic Contaminants and Other Inorganic Constituents (PDF)”). Referenced in Section 611.611.

“USEPA 150.1 (71)” means “pH: Method 150.1 (Electrometric)” (1971), in USEPA Inorganic Methods (83). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

“USEPA 150.2 (82)” means “pH, Continuous Monitoring (Electrometric)—Method 150.2” (December 1982), in USEPA Inorganic Methods (83). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

“USEPA 150.3 (17)” means “Method 150.3: Determination of pH in Drinking Water”, Version 1.0 (February 2017), USEPA, Office of Ground Water and Drinking Water, document number EPA 815/B-17/001. Available from USEPA, NSCEP (search for “815B17001”) and USEPA, OGWDW (under “Disinfection Byproduct Rules (PDF)” and “Inorganic Contaminants and Other Inorganic Constituents (PDF)”). Referenced in Section 611.611.

“USEPA 180.1 (93)” means “Method 180.1: Determination of Turbidity by Nephelometry”, Revision 2.0 (August 1993), in USEPA Environmental Inorganic Methods (93). Referenced in Section 611.531.
BOARD NOTE: Also individually available from NEMI.

“USEPA 200.5 (03)” means “Method 200.5: Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry”, Revision 4.2 (October 2003), USEPA, National Exposure Research Laboratory, document number EPA 600/R-06/115. Available from NEMI; USEPA, NSCEP (search for “600R06115”); and

USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)," "Inorganic Contaminants and Other Inorganic Constituents (PDF)," and "Secondary Contaminants (PDF)"). Referenced in Sections 611.611 and 611.612.

"USEPA 200.7 (94)" means "Method 200.7: Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry", Revision 4.4 (May 1994), in USEPA Environmental Metals Methods (94). Referenced in Sections 611.600, 611.611, and 611.612.
BOARD NOTE: Also individually available from NEMI.

"USEPA 200.8 (94)" means "Method 200.8: Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry", Revision 5.3 (May 1994), in USEPA Environmental Metals Methods (94). Referenced in Sections 611.600, 611.611, 611.612, and 611.720.
BOARD NOTE: Also individually available from NEMI.

"USEPA 200.9 (94)" means "Method 200.9: Determination of Metals and Trace Elements in Water by Ultrasonic Nebulization Inductively Coupled Plasma-Atomic Emission Spectrometry", Revision 2.2 (May 1994), in USEPA Environmental Metals Methods (94). Referenced in Sections 611.600, 611.611, and 611.612.
BOARD NOTE: Also individually available from NEMI.

"USEPA 245.1 (91)" means "Method 245.1: Determination of Mercury in Water by Cold Vapor Atomic Absorption Spectrometry", Revision 2.3 (April 1991), in USEPA Environmental Metals Methods (94). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 245.2 (74)" means "Mercury: Method 245.2 (Automated Cold Vapor Technique)" (1974), in USEPA Inorganic Methods (83). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 300.0 (93)" means "Method 300.0: Determination of Inorganic Anions by Ion Chromatography", Revision 2.1 (August 1993), in USEPA Environmental Inorganic Methods (93). Referenced in Sections 611.381 and 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 300.1 (97)" means "Method 300.1: Determination of Inorganic Anions in Drinking Water by Ion Chromatography", Revision 1.0 (September 1997), in USEPA Organic and Inorganic Methods (00). Referenced in Sections 611.381 and 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 302.0 (09)" means "Method 302.0: Determination of Bromate in Drinking Water Using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection" (September 2009), USEPA, Office of Water, document number EPA 815/B-09/014. Available from NEMI; USEPA, NSCEP (search "815B09014"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381 and 611.382.

"USEPA 317.0 (01)" means "Method 317.0: Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis", Revision 2.0 (July 2001), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-01/001. Available from NEMI; USEPA, NSCEP (search "815B01001"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381 and 611.382.

"USEPA 321.8 (97)" means "Method 321.8: Determination of Bromate in Drinking Waters by Ion Chromatography Inductively Coupled Plasma/Mass Spectrometry", Revision 1.0 (December 1997), in USEPA Organic and Inorganic Methods (00). Referenced in Sections 611.381 and 611.382.
BOARD NOTE: Also individually available from NEMI.

"USEPA 326.0 (02)" means "Method 326.0: Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis", Revision 1.0 (June 2002), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/R-03/007. Available from NEMI; NTRL (document number PB2003-107402); USEPA, NSCEP (search "815R03007"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in

Sections 611.381 and 611.382.

"USEPA 327.0 (05)" means "Method 327.0: Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry", Revision 1.1 (May 2005), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/R-05/008. Available from NEMI; USEPA, NSCEP (search "815R05008"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381 and 611.531.

"USEPA 334.0 (09)" means "Method 334.0: Determination of Residual in Drinking Water Using an On-line Chlorine Analyzer", Version 1.0 (September 2009), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-09/013. Available from NEMI; USEPA, NSCEP (search "815B09013"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381 and 611.531.

"USEPA 335.4 (93)" means "Method 335.4: Determination of Total Cyanide by Semi-Automated Colorimetry", Revision 1.0 (August 1993), in USEPA Environmental Inorganic Methods (93). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 353.2 (93)" means "Method 353.2: Determination of Inorganic Anions by Ion Chromatography", Revision 2.0 (August 1993), in USEPA Environmental Inorganic Methods (93). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI.

"USEPA 365.1 (93)" means "Method 365.1: Determination of Phosphorus by Automated Colorimetry", Revision 2.0 (August 1993), in USEPA Environmental Inorganic Methods (93). Referenced in Section 611.611.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)").

"USEPA 415.3 (05)" means "Method 415.3: Determination of Total Organic Carbon and Specific UV

Absorbance at 254 nm in Source Water and Drinking Water", Revision 1.1 (February 2005), USEPA, National Exposure Research Laboratory, document number EPA 600/R05-055. Available from USEPA, NSCEP (search "600R05055") and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Section 611.381.

"USEPA 415.3 (09)" means "Method 415.3, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", Revision 1.2 (September 2009), USEPA, National Exposure Research Laboratory, document number EPA 600/R09-122. Referenced in Section 611.381. Available from NEMI; USEPA, NSCEP (search "600R09122"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)").

"USEPA 502.2 (95)" means "Method 502.2: Volatile Organic Compounds in Water by Purge and Trap Capillary Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series", Revision 2.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.381 and 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 504.1 (95)" means "Method 504.1: 1,2-Dibromomethane (EDB), 1,2-Dibromo-3-Chloropropane (DBCP), and 1,2,3-Trichloropropane (123TCP) in Water by Microextraction and Gas Chromatography", Revision 1.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 505 (95)" means "Method 505: Analysis of Organohalide Pesticides and Commercial Polychlorinated Biphenyl (PCB) Products in Water by Microextraction and Gas Chromatography", Revision 2.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.645 and 611.648.
BOARD NOTE: Also individually available from NEMI.

"USEPA 506 (95)" means "Method 506: Determination of Phthalate and Adipate Esters in Drinking Water by Liquid-Liquid Extraction or Liquid-Solid Extraction and Gas Chromatography with Photoionization Detection",

Revision 1.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 507 (95)" means "Method 507: Determination of Nitrogen- and Phosphorus-Containing Pesticides in Water by Gas Chromatography with a Nitrogen-Phosphorus Detector", Revision 2.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.645 and 611.648.
BOARD NOTE: Also individually available from NEMI.

"USEPA 508 (95)" means "Method 508: Determination of Chlorinated Pesticides in Water by Gas Chromatography with an Electron Capture Detector", Revision 3.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.645 and 611.648.
BOARD NOTE: Also individually available from NEMI.

"USEPA 508A (89)" means "Method 508A: Screening for Polychlorinated Biphenyls by Perchlorination and Gas Chromatography", Revision 1.0 (1989), in USEPA Organic Methods (91). Referenced in Sections 611.645 and 611.646.
BOARD NOTE: Also individually available from NEMI.

"USEPA 508.1 (95)" means "Method 508.1: Determination of Chlorinated Pesticides, Herbicides, and Organohalides by Liquid-Solid Extraction and Electron Capture Gas Chromatography", Revision 2.0 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.645 and 611.648.
BOARD NOTE: Also individually available from NEMI.

"USEPA 515.1 (89)" means "Method 515.1: Determination of Chlorinated Acids in Drinking Water by Gas Chromatography with an Electron Capture Detector", Revision 4.1 (1989), in USEPA Organic Methods (91). Referenced in Section 611.645.

"USEPA 515.2 (95)" means "Method 515.2: Determination of Chlorinated Acids in Water Using Liquid-Solid Extraction and Gas Chromatography with an Electron Capture Detector", Revision 1.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 515.3 (96)" means "Method 515.3: Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Extraction, Derivatization and Gas Chromatography with Electron Capture Detection", Revision 1.0 (July 1996), in USEPA Organic and Inorganic Methods (00). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 515.4 (00)" means "Method 515.4: "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection" Revision 1.0 (April 2000), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-00/001. Available from NEMI; USEPA, NSCEP (search "815B00001"); and USEPA, OGWDW (under "Organic Contaminants (PDF)"). Referenced in Section 611.645.

"USEPA 523 (11)" means "Method 523: Determination of Triazine Pesticides and Other Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS)", Version 1.0 (February 2011), USEPA, Office of Ground Water and Drinking Water, Standards and Risk Management Division, Technical Support Center, document number EPA 815/R-11-002. Available from USEPA, NSCEP (search "815R11002"); and USEPA, OGWDW (under "Organic Contaminants (PDF)"). referenced in Section 611.645.

"USEPA 524.2 (95)" means "Method 524.2: Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry", Revision 4.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 524.3 (09)" means "Method 524.3: Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Spectrometry", Revision 1.0 (June 2009), USEPA, Office of Ground Water and Drinking Water, Standards and Risk Management Division, Technical Support Center, document number EPA 815/B-09/009. Available from NEMI; USEPA, NSCEP (search for "815B09009"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)" and "Organic Contaminants (PDF)"). Referenced in Sections 611.381

and 611.645.

"USEPA 524.4 (13)" means "Method 524.4, "Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/Spectrometry Using Nitrogen Purge Gas" (May 2013), USEPA, Office of Ground Water and Drinking Water, Standards and Risk Management Division, Technical Support Center, document number EPA 815/R-13/002. Available from USEPA, NSCEP (search for "815R13002"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)" and "Organic Contaminants (PDF)"). Referenced in Sections 611.381 and 611.645.

"USEPA 525.2 (95)" means "Method 525.2: Determination of Organic Compounds in Drinking by Liquid-Liquid Extraction and Capillary Column Gas Chromatography/Mass Spectrometry", Revision 2.0 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 525.3 (12)" means "Method 525.3: Determination of Total Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)", Version 1.0 (February 2012), USEPA, National Exposure Research Laboratory, document number EPA 600/R-12/010. Available from USEPA, NSCEP (search "600R12010") and USEPA, OGWDW (under "Organic Contaminants (PDF)"). Referenced in Section 611.645.

"USEPA 531.1 (95)" means "Method 531.1: Measurement of N-Methylcarbamoyloximes and N-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Post Column Derivatization", Revision 3.1 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 531.2 (01)" means "Method 531.2: Measurement of N-Methylcarbamoyloximes and N-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Postcolumn Derivatization", Revision 1.0 (September 2001), USEPA, Office of Ground Water and Drinking Water, Standards and Risk Management Division, Technical Support Center, document number EPA 815/B-01/002. Available from

NEMI; USEPA, NSCEP (search "815B01002"); and USEPA, OGWDW (under "Organic Contaminants (PDF)"). Referenced in Section 611.645. See also and

"USEPA 536 (07)" means "Method 536: Determination of Triazine Pesticides and Other Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)", Version 1.0 (October 2007), USEPA Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-07/002. Available from USEPA, NSCEP (search "815B07002") and USEPA, OGWDW (under "Organic Contaminants (PDF)"). Referenced in Section 611.645.

"USEPA 547 (90)" means "Method 547: Determination of Glyphosate in Drinking Water by Direct-Aqueous-Injection HPLC, Post-Column Derivatization, and Fluorescence Detection" (July 1990), in USEPA Organic Methods—Supplement I (90). Referenced in Section 611.645.

"USEPA 548.1 (92)" means "Method 548.1: Determination of Endothall in Drinking Water by Ion-Exchange Extraction, Acidic Methanol Methylation and Gas Chromatography/Mass Spectrometry", Revision 1.0 (August 1992), in USEPA Organic Methods—Supplement II (92). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 549.2 (97)" means "Method 549.2: Determination of Diquat and Paraquat in Drinking Water by Liquid-Solid Extraction and High Performance Liquid Chromatography with Ultraviolet Detection", Revision 1.0 (June 1997), USEPA, Office of Research and Development, National Exposure Research Laboratory. Available from NEMI. Referenced in Section 611.645.

"USEPA 550 (90)" means "Method 550: Determination of Polycyclic Aromatic Hydrocarbons in Drinking Water by Liquid-Liquid Extraction and HPLC with Coupled Ultraviolet and Fluorescence Detection" (July 1990), in USEPA Organic Methods—Supplement I (90). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 550.1 (90)" means "Method 550.1: Determination of Polycyclic Aromatic Hydrocarbons in

Drinking Water by Liquid-Solid Extraction and HPLC with Coupled Ultraviolet and Fluorescence Detection" (July 1990), in USEPA Organic Methods—Supplement I (90). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 551.1 (95)" means "Method 551.1: Measurement of N-Methylcarbamoyloximes and N-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Post Column Derivatization", Revision 1.0 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Section 611.645.

"USEPA 552.1 (92)" means "Method 552.1: Determination of Haloacetic Acids and Dalapon in Drinking Water by Ion-Exchange Liquid-Solid Extraction and Gas Chromatography with an Electron Capture Detector", Revision 1.0 (August 1992), in USEPA Organic Methods—Supplement II (92). Referenced in Sections 611.381 and 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 552.2 (95)" means "Method 552.2: Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Extraction, Derivatization and Gas Chromatography with Electron Capture Detection", Revision 1.0 (1995), in USEPA Organic Methods—Supplement III (95). Referenced in Sections 611.381 and 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 552.3 (03)" means "Method 552.3: Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection", Revision 1.0 (July 2003), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-03/002. Available from NEMI; USEPA, NSCEP (search "815B03002"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381 and 611.645.

"USEPA 555 (92)" means "Method 555: Determination of Chlorinated Acids in Water by High Performance Liquid Chromatography with a Photodiode Array Ultraviolet Detector", Revision 1.0 (August 1992), in USEPA Organic

Methods—Supplement II (92). Referenced in Section 611.645.
BOARD NOTE: Also individually available from NEMI.

"USEPA 557 (09)" means "Method 557: Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)", Version 1.0 (September 2009), USEPA, Office of Ground Water and Drinking Water, Technical Support Center, document number EPA 815/B-09/012. Available from NEMI; USEPA, NSCEP (search "815B09012"); and USEPA, OGWDW (under "Disinfection Byproduct Rules (PDF)"). Referenced in Sections 611.381, 611.382, and 611.645.

"USEPA 900.0 (80)" means "Gross Alpha and Gross Beta Radioactivity in Drinking Water—Method 900.0" (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 900.0 (18)" means Method 900.0, Revision 1.0 "Gross Alpha and Gross Beta Radioactivity in Drinking Water" (February 2018), USEPA, Office of Water, document number EPA 815/B-18/002. Also available from USEPA, NSCEP (search "815B18002") and USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 901.0 (80)" means "Radioactive Cesium in Drinking Water—Method 901.0" (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 901.1 (80)" means "Gamma Emitting Radionuclides in Drinking Water—Method 901.1" (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under "Radionuclides (PDF)").

"USEPA 902.0 (80)" means "Radioactive Iodine in Drinking Water—Method 902.0" (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.

“USEPA 903.0 (80)” means “Alpha-Emitting Radium Isotopes in Drinking Water—Method 903.0” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 903.1 (80)” means “Radium-226 in Drinking Water Radon Emanation Technique—Method 903.1” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 904.0 (80)” means “Radium-228 in Drinking Water—Method 904.0” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 905.0 (80)” means “Radioactive Strontium in Drinking Water—Method 905.0” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 906.0 (80)” means “Tritium in Drinking Water—Method 906.0” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 908.0 (80)” means “Uranium in Drinking Water—Radiochemical Method—Method 908.0” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI.

“USEPA 908.1 (80)” means “Uranium in Drinking Water—Fluorometric Method—Method 908.1” (1980), in USEPA Radioactivity Methods (80). Referenced in Section 611.720.
BOARD NOTE: Also individually available from NEMI and USEPA, OGWDW (under “Radionuclides (PDF)”).

“USEPA 1600 (02)” means “Method 1600: Enterococci in

Water by Membrane Filtration Using membrane-Enterococcus Indoxyl–β–D–Glucoside Agar (mEI)" (September 2002), USEPA, Office of Water, document number EPA 821/R–02/022. Available from NEMI; USEPA, NSCEP (search "821R02022"); and USEPA, OGWDW (under "Ground Water Rule (PDF)"). Referenced in Section 611.802.
BOARD NOTE: SM 9230 C (93) and SM 9230 (13), "Fecal Streptococcus and Enterococcus Groups, Membrane Filter Techniques", are USEPA-approved variations of this method.

"USEPA 1601 (01)" means "Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure" (April 2001), USEPA, Office of Water, document number EPA 821/R–01/030. Available from NEMI and USEPA, NSCEP (search "821R01030"); and USEPA, OGWDW (under "Ground Water Rule (PDF)"). Referenced in Section 611.802.

"USEPA 1602 (01)" means "Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure" (April 2001), USEPA, Office of Water, document number EPA 821/R–01/029. Available from NEMI and USEPA, NSCEP (search "821R01029"); and USEPA, OGWDW (under "Ground Water Rule (PDF)"). Referenced in Section 611.802.

"USEPA 1604 (02)" means "Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium)" (September 2002), USEPA, Office of Water, document number EPA 821/R-02/024. Available from NEMI and USEPA, NSCEP (search "821R02024"); and USEPA, OGWDW (under "Ground Water Rule (PDF)", "Revised Total Coliforms Rule (PDF)", and "Surface Water Treatment Rule (PDF)"). Referenced in Sections 611.802 and 611.1052.

"USEPA 1613 (94)" means "Method 1613: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS", Revision B (October 1994), USEPA, Office of Water, Engineering and Analysis Division, document number EPA 821/B-94/005. Available from NEMI; NTRL (document number PB95-104774); USEPA, NSCEP (search "821B94005"); and USEPA, OGWDW (under "Organic Contaminants (PDF)"). Referenced in

Section 611.645.

"USEPA 1622 (01)" means "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA" (April 2001), USEPA, Office of Water, document number EPA 821/R-01/026. Available from NEMI; and USEPA, NSCEP (search "821R01026"). Referenced in Section 611.1007.

"USEPA 1622 (05)" means "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA" (December 2005), USEPA, Office of Ground Water and Drinking Water, document number EPA 815/R-05/001. Available from USEPA, NSCEP (search "815R05001") and USEPA, OGWDW (under "Long Term 2 Enhanced Surface Water Treatment Rule (PDF)"). Referenced in Sections 611.1004 and 611.1007.

"USEPA 1623 (99)" means "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA" (April 1999), USEPA, Office of Ground Water and Drinking Water, document number EPA 821/R-99/006. Available from USEPA, NSCEP (search "821R99006"). Referenced in Section 611.1007.

"USEPA 1623 (01)" means "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA" (April 2001), USEPA, Office of Ground Water and Drinking Water, document number EPA 821/R-01/025. Available from NEMI and USEPA, NSCEP (search "821R01025"). Referenced in Section 611.1007.

"USEPA 1623 (05)" means "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA" (December 2005), USEPA, Office of Ground Water and Drinking Water, document number EPA 815/R-05/002. Available from USEPA, NSCEP (search "815R05002") and USEPA, OGWDW (under "Long Term 2 Enhanced Surface Water Treatment Rule (PDF)"). Referenced in Sections 611.1004 and 611.1007.

"USEPA 1623.1 (12)" means "Method 1623.1, "Method 1623.1: Cryptosporidium and Giardia in Water by Filtration/IMS/FA" (January 2012), USEPA, Office of Ground Water and Drinking Water, document number EPA 816/R-12/001. Available from USEPA, NSCEP (search "816R12001") and USEPA, OGWDW (under "Long Term

2 Enhanced Surface Water Treatment Rule (PDF)"). Referenced in Section 611.1004.

USEPA Documents Containing Multiple Numbered Methods

"USEPA Environmental Inorganic Methods (93)" means "Methods for the Determination of Inorganic Substances in Environmental Samples" (August 1993), USEPA, Environmental Monitoring Systems Laboratory, document number EPA 600/R-93-100 (for USEPA 180.1 (93), USEPA 300.0 (93), USEPA 335.4 (93), USEPA 353.2 (93), and USEPA 365.1 (93) only). Available from NTRL (document number PB94-121811) and USEPA, NSCEP (search "600R93100").

"USEPA Environmental Metals Methods (94)" means "Methods for the Determination of Metals in Environmental Samples—Supplement I", May 1994, USEPA, Environmental Monitoring Systems Laboratory, document number EPA 600/R-94-111 (for USEPA 200.7 (94), USEPA 200.8 (94), USEPA 200.9 (94), and USEPA 245.1 (94) only). Referenced in Sections 611.600, 611.611, 611.612, and 611.720. Available from NTRL (document number PB84-125472) and USEPA, NSCEP (search "600R94111").

"USEPA Inorganic Methods (83)" means "Methods for Chemical Analysis of Water and Wastes"(March 1983), USEPA, Office of Research and Development, document number EPA 600/4-79-020 (USEPA 150.1 (71), USEPA 150.2 (82), and USEPA 245.2 (74) only). Available from NTRL (document number PB84-128677) and USEPA, NSCEP (search "600479020"). Referenced in Section 611.611.

"USEPA Organic and Inorganic Methods (00)" means "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1" (August 2000), USEPA, Office of Water and Office of Research and Development, document number EPA 815/R-00/014 (Methods 300.1 (97), USEPA 321.8 (97), and USEPA 515.3 (96) only). Available from NTRL (document number PB2000-106981) and USEPA, NSCEP (search "815R00014").

"USEPA Organic Methods (91)" means "Methods for the

Determination of Organic Compounds in Drinking Water", (December 1988 (revised July 1991)), USEPA, Office of Research and Development, document number EPA 600/4-88/039 (USEPA 508A (89) and USEPA 515.1 (89) only). Available from NTRL (document number PB91-231480) and USEPA, NSCEP (search "600488039") and USEPA, OGWDW.

"USEPA Organic Methods—Supplement I (90)" means "Methods for the Determination of Organic Compounds in Drinking Water—Supplement I" (July 1990), USEPA, Environmental Monitoring Systems Laboratory, document number EPA 600/4-90/020 (USEPA 547 (90), USEPA 550 (90) and USEPA 550.1 (90) only). Available from NTRL (document number PB91-146027) and USEPA, NSCEP (search "600490020").

"USEPA Organic Methods—Supplement II (92)" means "Methods for the Determination of Organic Compounds in Drinking Water—Supplement II" (August 1992), USEPA, Office of Research and Development, document number EPA 600/R-92/129 (USEPA 548.1 (92), USEPA 552.1 (92), and USEPA 555 (92) only). Available from NTRL (document number PB92-207703) and USEPA, NSCEP (search "600R92129").

"USEPA Organic Methods—Supplement III (95)" means "Methods for the Determination of Organic Compounds in Drinking Water—Supplement III" (August 1995), USEPA, Office of Research and Development, document number EPA 600/R-95/131 (USEPA 502.2 (95), USEPA 504.1 (95), USEPA 505 (95), USEPA 506 (95), USEPA 507 (95), USEPA 508 (95), USEPA 508.1 (95), USEPA 515.2 (95), USEPA 524.2 (95), USEPA 525.2 (95), USEPA 531.1 (95), USEPA 551.1 (95), and USEPA 552.2 (95) only). Available from NTRL (document number PB95-261616) and USEPA, NSCEP (search "600R95131").

"USEPA Radioactivity Methods (80)" means "Prescribed Procedures for Measurement of Radioactivity in Drinking Water" (August 1980), USEPA, Office of Research and Development, Environmental Monitoring and Support Laboratory, document number EPA 600/4-80/032 (USEPA 900.0 (80), USEPA 901.0 (80), USEPA 901.1 (80), USEPA 902.0 (80), USEPA 903.0 (80), USEPA 903.1 (80), USEPA 904.0 (80), USEPA 905.0 (80), USEPA 906.0 (80), USEPA 908.0 (80), and USEPA 908.1 (80) only.). Available from NTRL (document number PB80-224744); USEPA, NSCEP (search "821480032"); and USEPA, OGWDW (under "Radionuclides (PDF))".

"USEPA Radiochemistry Procedures (84)" means "Radiochemistry Procedures Manual" (June 1984), USEPA, Eastern Environmental Radiation Facility, document number EPA 520/5-84-006 (USEPA 00-01 (84), USEPA 00-02 (84), USEPA 00-07 (84), USEPA H-02 (84), USEPA Ra-03 (84), USEPA Ra-04 (84), USEPA Ra-05 (84), USEPA Sr-04 (84) only). Available from NTRL (document number PB84215581); USEPA, NSCEP (search "520584006"); and USEPA, OGWDW.

Unnumbered Methods

"USEPA ARP (73)" means "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions" (May 1973), USEPA, Office of Research and Monitoring, National Environmental Research Center, document number EPA-R4-73-014. Available from NTRL (document number PB222154) and USEPA, NSCEP (search "R473014"). Referenced in Section 611.720.

"USEPA IRM (76)" means "Interim Radiochemical Methodology for Drinking Water" (March 1976), USEPA, Office of Research and Development, Environmental Monitoring and Support Laboratory, document number EPA 600/4-75-008 (revised) (pages 1 through 37 only). Available from NTRL (document number PB253258); USEPA, NSCEP (search "600475008A"); and USEPA, OGWDW (under "Radionuclides (PDF)"). Referenced in Section 611.720.

"USEPA IRM (76), pages 1-3" means pages 1 through 3, "Gross Alpha and Beta Radioactivity in Drinking Water", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 4-5" means pages 4 through 5, "Radioactive Cesium in Drinking Water", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 6-8" means pages 6 through 8, "Radioactive Iodine in Drinking Water: Precipitation Method", in USEPA IRM (76).

Referenced in Section 611.720.

"USEPA IRM (76), pages 9-12" means pages 9 through 12, "Radioactive Iodine in Drinking Water: Distillation Method", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 13-15" means pages 13 through 15, "Alpha-Emitting Radium Isotopes in Drinking Water: Precipitation Method", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 16-23" means pages 16 through 23, "Radium-226 in Drinking Water: Radon Emanation Technique", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 24-28" means pages 24 through 28, "Radium-228 in Drinking Water: Sequential Method Radium-228/Radium-226", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 29-33" means pages 29 through 33, "Radioactive Strontium in Drinking Water", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA IRM (76), pages 34-37" means pages 34 through 37, "Tritium in Drinking Water", in USEPA IRM (76). Referenced in Section 611.720.

"USEPA RCA (79)" means "Radiochemical Analytical Procedures for Analysis of Environmental Samples" (March 1979), USEPA, Environmental Monitoring and Support Laboratory, document number EMSL-LV-0539-17 (pages 1 through 5, 19 through 48, 65 through 73, and 87 through 95 only). Available from NTRL (document number EMSLLV053917); USEPA, NSCEP (search "EMSLLV053917") and USEPA, OGWDW (under "Radionuclides (PDF)"). Referenced in Section 611.720.

"USEPA RCA (79), pages 1-5" means pages 1 through 5, "Determination of Gross Alpha and Beta in Water", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA RCA (79), pages 19-32" means pages 19 through 32, "Determination of Radium-226 and

Radium-228 in Water, Soil, Air, and Biological Tissue", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA RCA (79), pages 33-48" means pages 33 through 48, "Isotopic Determination of Plutonium, Uranium, and Thorium in Water, Soil, Air, and Biological Tissue", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA RCA (79), pages 65-73" means pages 65 through 73, "Determination of Strontium-89 and Strontium-90 in Water, Soil, Air, and Biological Tissue", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA RCA (79), pages 87-91" means pages 87 through 91, "Determination of Tritium in Water, Soil, Air, and Biological Tissue (Direct Method)", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA RCA (79), pages 92-95" means pages 92 through 95, "Isotopic Analysis by Gamma Ray Spectra Using Lithium-Drifted Geranium Detectors", in USEPA RCA (79). Referenced in Section 611.720.

"USEPA Technical Notes (94)" means "Technical Notes on Drinking Water Methods" (October 1994), document number EPA 600/R-94-173, USEPA, Office of Research and Development. Available from NTRL (document number PB95-104766); and USEPA, NSCEP (search "600R94173"). Referenced in Sections 611.531, 611.611, and 611.645.

Sources of USEPA Methods

NEMI. National Environmental Method Index (on-line at www.nemi.gov/home/).

NTRL. National Technical Reports Library, U.S. Department of Commerce, 5301 Shawnee Road, Alexandria, VA 22312 (703-605-6000 or 800-553-6847, ntrl.ntis.gov).

USEPA, NSCEP. United States Environmental Protection Agency, National Service Center for Environmental

Publications, P.O. Box 42419, Cincinnati, OH 45242-0419, accessible on-line and available by download from http://www.epa.gov/nscep/ using the search term indicated for the individual method).

USEPA, OGWDW. United States Environmental Protection Agency, Office of Ground Water and Drinking Water (methods cited as available are directly available through a link in the indicated list on www.epa.gov/ dwanalyticalmethods/approved-drinking-water-analytical-methods).

USGS Methods. All documents available from United States Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

"USGS I-1030-85" means "Alkalinity, electrometric titration, I-1030-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS I-1601-85" means "Phosphorus, orthophosphate, colorimetric, phosphomolybdate, I-1601-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS I-1700-85" means "Silica, colorimetric, molybdate blue, I-1700-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS I-2598-85" means "Phosphorus, orthophosphate, colorimetric, phosphomolybdate, automated-discrete, I-2598-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS I-2601-90" means "Phosphorus, orthophosphate, colorimetry, phosphomolybdate, automated segment-flow, I-2601-

90", in "Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments", U.S. Geological Survey, Open File Report 93-125 (1993). Available at pubs.usgs.gov/publication/ofr93125. Referenced in Section 611.611.

"USGS I-2700-85" means "Silica, colorimetric, molybdate blue, automated-segmented flow, I-2700-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS I-3300-85" means "Cyanide, colorimetric, pyridine-pyrazolone, I-3300-85", in "Techniques of Water-Resource Investigation of the United States Geological Survey", 3rd ed. (1989), Book 5, Chapter A1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments". Available at pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf. Referenced in Section 611.611.

"USGS R-1110-76" means "Cesium-137 and cesium-134, dissolved. Inorganic ion-exchange method—gamma counting, R-1110-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"USGS R-1111-76" means "Radiocesium, dissolved, as cesium-137. Inorganic ion-exchange method—beta counting, R-1111-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"USGS R-1120-76" means "Gross alpha and beta radioactivity, dissolved and suspended, R-1120-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

“USGS R-1140-76” means “Radium, dissolved, as radium-226. Precipitation method, R-1140-76”, in “Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey”, Book 5, Chapter A-5, “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments” (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

“USGS R-1141-76” means “Radium-226, dissolved. Radon emanation method, R-1141-76”, in “Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey”, Book 5, Chapter A-5, “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments” (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

“USGS R-1142-76” means “Radium-228, dissolved. Determination by separation and counting of actinium-228, R-1142-76”, in “Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey”, Book 5, Chapter A-5, “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments” (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

“USGS R-1160-76” means “Strontium-90, dissolved. Chemical separation and precipitation method, R-1160-76”, in “Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey”, Book 5, Chapter A-5, “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments” (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

“USGS R-1171-76” means “Tritium. Liquid scintillation, Denver lab method—gamma counting, R-1171-76”, in “Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey”, Book 5, Chapter A-5, “Methods for Determination of Radioactive Substances in Water and Fluvial Sediments” (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"USGS R-1180-76" means "Uranium, dissolved. Fluorometric method—direct, R-1180-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"USGS R-1181-76" means "Uranium, dissolved. Fluorometric method—extraction procedure, R-1181-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"USGS R-1182-76" means "Uranium, dissolved, isotopic ratios. Alpha spectrometry—chemical separation, R-1182-76", in "Techniques of Water-Resource Investigation of the Water Resources Investigations of the United States Geological Survey", Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments" (1977). Available at pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf. Referenced in Section 611.720.

"Waters B-1011 (87)" means "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", Method B-1011 (August 1987). Available from Waters Corporation, Technical Services Division, 34 Maple St., Milford, MA 01757 (800-252-4752 or 508-478-2000, www.waters.com) and USEPA, OGWDW (under "Inorganic Contaminants and Other Inorganic Constituents (PDF)"). Referenced in Section 611.611.

~~a) Abbreviations and short-name listing of references. The following names and abbreviated names, presented in alphabetical order, are used in this Part to refer to materials incorporated by reference:~~

~~"AMI Turbiwell Method" means "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter", available from NEMI or from SWAN Analytische Instrumente AG.~~

~~"Aqueous Radiochemical Procedures" means "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", available from NTIS; USEPA, EMSL; and USEPA, NSCEP.~~

~~“ASTM Method” means a method published by and available from the American Society for Testing and Materials (ASTM).~~

~~“Charm Fast Phage” means “Fast Phage Test Procedure. Presence/Absence for Coliphage in Ground Water with Same Day Positive Prediction”, ver. 009 (Nov. 2012), available from Charm Sciences Inc.~~

~~“ChlordioX Plus Test” means “Chlorine Dioxide and Chlorite in Drinking Water by Amperometry using Disposable Sensors”, available from Palintest Ltd.~~

~~“Chromocult® Method” means “Chromocult® Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters”, available from EMD Millipore.~~

~~“Dioxin and Furan Method 1613” means “Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS”, available from NTIS.~~

~~“E*Colite Test” means “Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water”, available from Charm Sciences, Inc. and USEPA, Water Resource Center.~~

~~“EML Procedures Manual” means “EML Procedures Manual, HASL 300”, available from USDOE, EML.~~

~~“Enterolert” means “Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters”, available from American Society for Microbiology.~~

~~“Georgia Radium Method” means “The Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-ray Spectrometry Using HPGE or Ge(Li) Detectors”, rev. 1.2, December 2004, available from the Georgia Tech Research Institute.~~

~~“GLI Method 2” means GLI Method 2, “Turbidity”, Nov. 2, 1992, available from Great Lakes Instruments, Inc.~~

~~“Guidance Manual for Filtration and Disinfection” means “Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems using Surface Water Sources”, March 1991, available from USEPA, NSCEP.~~

~~“Hach FilterTrak Method 10133” means “Determination of Turbidity by Laser Nephelometry”, available from Hach Co.~~

~~“Hach Method 8026” means “Spectrophotometric Measurement of Copper in Finished Drinking Water”, December 2015, rev. 1.2, available from the Hach Company.~~

~~“Hach Method 10241” means “Spectrophotometric Measurement of Free Chlorine (Cl_2) in Finished Drinking Water”, November 2015, rev. 1.2, available from the Hach Company.~~

~~“Hach Method 10258” means “Determination of Turbidity by 360° Nephelometry”, January 2016, available from the Hach Company.~~

~~“Hach Method 10260” means “Hach Method 10260 – Determination of Chlorinated Oxidants (Free and Total) in Water Using Disposable Planar Reagent-filled Cuvettes and Mesofluic Channel Colorimetry”, available from the Hach Company.~~

~~“Hach Method 10261” means “Total Organic Carbon in Finished Drinking Water by Catalyzed Ozone Hydroxyl Radical Oxidation Infrared Analysis”, December 2015, rev. 1.2, available from the Hach Company.~~

~~“Hach Method 10267” means “Spectrophotometric Measurement of Total Organic Carbon (TOC) in Finished Drinking Water”, December 2015, rev. 1.2, available from the Hach Company.~~

~~“Hach Method 10272” means “Spectrophotometric Measurement of Copper in Finished Drinking Water”, December 2015, rev. 1.2, available from the Hach Company.~~

~~“Hach SPDANS 2 Method 10225” means “Hach Company SPADNS 2 (Arsenic-free) Fluoride Method 10225 – Spectrophotometric Measurement of Fluoride in Water and Wastewater”, available from the Hach Co.~~

~~“Hach TNTplus 835/836 Method 10206” means “Hach Company TNTplus 835/836 Nitrate Method 10206 – Spectrophotometric Measurement of Nitrate in Water and Wastewater”, available from the Hach Co.~~

~~“ITS Method D99-003” means Method D99-003, rev. 3.0, “Free Chlorine Species ($HOCl^-$ and OCl^-) by Test Strip”, available from Industrial Test Systems, Inc.~~

~~“Kelada 01” means “Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate”, rev. 1.2, available from NTIS.~~

~~“Lovibond PTV 1000” means “Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 1000 White Light LED Turbidimeter,” December 2016. Revision 1.0, available from Tintometer,~~

~~Inc.~~

~~“Lovibond PTV 2000” means “Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter,” December 2016. Revision 1.0, available from Tintometer, Inc.~~

~~“Lovibond PTV 6000” means “Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter,” December 2016. Revision 1.0, available from Tintometer, Inc.~~

~~“m-ColiBlue24 Test” means “Total Coliforms and E. coli Membrane Filtration Method with m-ColiBlue24® Broth”, available from USEPA, Water Resource Center and Hach Company.~~

~~“Method ME355.01” means “Determination of Cyanide in Drinking Water by GC/MS Headspace Analysis”, available from NEMI or from H&E Testing Laboratory.~~

~~“Mitchell Method M5271, rev. 1.1” means “Determination of Turbidity by Laser Nephelometry”, available from NEMI and Leck Mitchell, PhD.~~

~~“Mitchell Method M5331, rev. 1.1” means “Determination of Turbidity by LED Nephelometry”, available from NEMI and Leck Mitchell, PhD.~~

~~“Mitchell Method M5331, rev. 1.2” means “Determination of Turbidity by LED or Laser Nephelometry”, available from NEMI and Leck Mitchell, PhD.~~

~~“Modified Colitag™ Test” means “Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in Water”, available from NEMI and CPI International.~~

~~“NBS Handbook 69” means “Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure”, available from IAEA and ORAU.~~

~~“NECi Nitrate-Reductase Method” means Nitrate Elimination Company Inc. (NECi), “Method for Nitrate Reductase Nitrate-Nitrogen Analysis of Drinking Water”, ver. 1.0, rev. 2.0, February 2016, available from Superior Enzymes Inc.~~

~~“New Jersey Radium Method” means “Determination of Radium 228 in Drinking Water”, available from the New Jersey Department of Environmental Protection.~~

~~“New York Radium Method” means “Determination of Ra-226 and Ra-228 (Ra-02)”, available from the New York Department of Public Health.~~

~~“OI Analytical Method OIA-1677” means “Method OIA-1677, DW Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry”, available from ALPKEM, Division of OI Analytical.~~

~~“Orion Method AQ4500” means “Determination of Turbidity by LED Nephelometry”, available from Thermo Scientific.~~

~~“Palintest ChloroSense” means “Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense”, available from NEMI or Palintest Ltd.~~

~~“Palintest Method 1001” means “‘Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry,’ Method Number 1001”, available from Palintest, Ltd. or the Hach Company.~~

~~“QuikChem Method 10–204–00–1-X” means “Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis”, available from Lachat Instruments.~~

~~“Readycult® 2007” means “Readycult® Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters”, v. 1.1, available from EMD Millipore.~~

~~“SimPlate Method” means “IDEXX SimPlate TM HPC Test Method for Heterotrophs in Water”, available from IDEXX Laboratories, Inc.~~

~~“Standard Methods” means “Standard Methods for the Examination of Water and Wastewater”, available from the American Public Health Association or the American Waterworks Association.~~

~~“Standard Methods Online” means the website maintained by the Standard Methods Organization (at www.standardmethods.org) for purchase of the latest versions of methods in an electronic format.~~

~~“Syngenta AG-625” means “Atrazine in Drinking Water by Immunoassay”, February 2001 is available from Syngenta Crop Protection, Inc.~~

~~“Systea Easy (1-Reagent)” means “Systea Easy (1-Reagent) Nitrate Method”, available from NEMI or Systea Scientific LLC.~~

~~“Technical Bulletin 601” means “Technical Bulletin 601, Standard Method of Testing for Nitrate in Drinking Water”, July 1994, available from Thermo Scientific.~~

~~“Technicon Methods” means “Fluoride in Water and Wastewater”, available from Bran + Luebbe.~~

~~"Tecta EC/TC P-A Test" means "TECTA™ EC/TC medium and the TECTA™ Instrument: a Presence/Absence Method for Simultaneous Detection of Total Coliforms and Escherichia coli (E. coli) in Drinking Water", ver. 1.0 or 2.0, available from Pathogen Detection Systems, Inc..~~

~~"Thermo-Fisher Discrete Analyzer" means "Drinking Water Orthophosphate for Thermo Scientific Gallery discrete analyzer", available from Thermo-Fisher Scientific.~~

~~"Thermo-Fisher Method 557.1" means "Thermo Fisher Method 557.1: Determination of Haloacetic Acids in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection," January 2017. ver. 1.0, available from Thermo-Fisher Scientific.~~

~~"USEPA Asbestos Method 100.1" means Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water", September 1983, available from NTIS.~~

~~"USEPA Asbestos Method 100.2" means Method 100.2, "Determination of Asbestos Structures over 10-mm in Length in Drinking Water", June 1994, available from NTIS.~~

~~"USEPA Environmental Inorganic Methods" means "Methods for the Determination of Inorganic Substances in Environmental Samples", August 1993, available from NTIS.~~

~~"USEPA Environmental Metals Methods" means "Methods for the Determination of Metals in Environmental Samples", available from NTIS.~~

~~"USEPA Inorganic Methods" means "Methods for Chemical Analysis of Water and Wastes", March 1983, available from NTIS.~~

~~"USEPA Interim Radiochemical Methods" means "Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75/008 (revised), March 1976 (pages 1-3, 4-5, 6-8, 9-12, 13-15, 16-23, 24-28, 29-33, and 34-37 only). Available from NTIS; USEPA, EMSL; and USEPA, NSCEP.~~

~~"USEPA Method 150.3" means "Determination of pH in Drinking Water", February 2017, ver. 1.0, EPA 815/B-17/001, available from USEPA, NSCEP.~~

~~"USEPA Method 1600" means "Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl- b -D-Glucoside Agar (mEI)", available from NEMI; USEPA, NSCEP; and USEPA, Water Resource Center.~~

~~"USEPA Method 1601" means "Method 1601: Male-specific (F^+) and Somatic Coliphage in Water by Two-step Enrichment Procedure", available from NEMI; USEPA, NSCEP; and USEPA, Water Resource Center.~~

~~"USEPA Method 1602" means "Method 1602: Male-specific (F^+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure", available from NEMI; USEPA, NSCEP; and USEPA, Water Resource Center.~~

~~"USEPA Method 1604" means "Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium)", available from NEMI; USEPA, NSCEP; and USEPA, Water Resource Center.~~

~~"USEPA NERL Method 200.5 (rev. 4.2)" means Method 200.5, rev. 4.2, "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry", October 2003, EPA 600/R-06/115. Available from USEPA, ORD.~~

~~"USEPA NERL Method 415.3 (rev. 1.1)" means Method 415.3, rev. 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", USEPA, February 2005, EPA 600/R-05/055. Available from USEPA, NSCEP and USEPA, ORD.~~

~~"USEPA NERL Method 415.3 (rev. 1.2)" means Method 415.3, rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", USEPA, September 2009, EPA 600/R-09/122. Available from NEMI; USEPA, NSCEP; and USEPA, ORD.~~

~~"USEPA NERL Method 525.3 (ver. 1.0)" means Method 525.3, Version 1.0, "Determination of Total Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)", USEPA, February 2012, EPA 600/R-12/010. Available from USEPA, NSCEP and USEPA, ORD.~~

~~"USEPA NERL Method 549.2" means Method 549.2, rev. 1.0, "Determination of Diquat and Paraquat in Drinking Water by Liquid-Solid Extraction and High Performance Liquid Chromatography with Ultraviolet Detection", June 1997. Available from NEMI and USEPA, ORD.~~

~~"USEPA OGWDW Methods" means the methods listed as available from the USEPA, Office of Ground Water and Drinking Water (Methods 302.0, 317.0 (rev. 2.0), 326.0 (rev. 1.0), 327.0 (rev. 1.1), 334.0, 524.2 (rev. 1.0), 523 (rev. 1.0), 524.3 (rev. 1.0), 524.4, 531.2 (rev. 1.0), 536 (rev. 1.0), 552.3 (rev. 1.0), 557, 1622 (99), 1622 (01), 1622 (05), 1623 (99), 1623~~

~~(01), 1623 (05), and 1623.1). Available from NEMI (Methods 302.0, 317.0, 326.0, 327.0, 334.0, 515.4, 524.3, 531.2, 552.3, 557, 1622 (01), and 1623 (01) only); USEPA, NSCEP; and USEPA, OGWDW.~~

~~"USEPA Organic Methods" means "Methods for the Determination of Organic Compounds in Drinking Water", December 1988 (revised July 1991) (Methods 508A (rev. 1.0) and 515.1 (rev. 4.0)); "Methods for the Determination of Organic Compounds in Drinking Water — Supplement I", July 1990 (Methods 547, 550, and 550.1); "Methods for the Determination of Organic Compounds in Drinking Water — Supplement II", August 1992 (Methods 548.1 (rev. 1.0), 552.1 (rev. 1.0), and 555 (rev. 1.0)); and "Methods for the Determination of Organic Compounds in Drinking Water — Supplement III", August 1995 (Methods 502.2 (rev. 2.1), 504.1 (rev. 1.1), 505 (rev. 2.1), 506 (rev. 1.1), 507 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 515.2 (rev. 1.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 531.1 (rev. 3.1), 551.1 (rev. 1.0), and 552.2 (rev. 1.0)). Available from NEMI; NTIS; USEPA, NSCEP; and USEPA, EMSL.~~

~~"USEPA Organic and Inorganic Methods" means "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1", EPA 815/R-00/014, PB2000-106981, August 2000 (Methods 300.1 (rev. 1.0), 321.8 (rev. 1.0), and 515.3 (rev. 1.0) only). Available from NEMI; NTIS; and USEPA, NSCEP.~~

~~"USEPA Radioactivity Methods" means "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA 600/4-80/032, August 1980 (Methods 900.0, 901.0, 901.1, 902.0, 903.0, 903.1, 904.0, 905.0, 906.0, 908.0, and 908.1). Available from NEMI (Methods 900.0, 901.1, 903.0, 903.1, and 908.0 only); NTIS; and USEPA, NSCEP.~~

~~"USEPA Radiochemical Analyses" means "Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979 (pages 1-5, 19-32, 33-48, 65-73, 87-91, and 92-95 only). Available from NTIS and USEPA, NSCEP.~~

~~"USEPA Radiochemistry Procedures" means "Radiochemistry Procedures Manual", EPA 520/5-84/006, December 1987 (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04). Available from NEMI; NTIS; and USEPA, NSCEP.~~

~~"USEPA Technical Notes" means "Technical Notes on Drinking Water Methods", available from NTIS and USEPA, NSCEP.~~

~~"USGS Method" means the designated method in "Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory — Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments", available from NTIS and USGS.~~

~~BOARD NOTE: The USGS Methods are available in three volumes published in 1977, 1989, and 1993, as outlined in subsection (b).~~

~~"Waters Method B-1011" means "Waters Test Method for the Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", available from Waters Corporation, Technical Services Division.~~

~~b) The Board incorporates the following publications by reference:~~

~~ALPKEM, Division of OI Analytical, P.O. Box 9010, College Station, TX 77842-9010, telephone: 979-690-1711, Internet: www.oico.com.~~

~~OI Analytical Method OIA-1677, "Method OIA-1677 DW, Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry", EPA 821/R-04/001, January 2004, referenced in Section 611.611.~~

~~BOARD NOTE: Also available online for download from www.epa.gov/waterscience/methods/method/cyanide/1677-2004.pdf.~~

~~APHA. American Public Health Association, 800 I Street NW, Washington, DC 20005 202-777-2742.~~

~~Standard Methods, 16th ed., "Standard Methods for the Examination of Water and Wastewater", 16th Edition, 1985. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 17th ed., "Standard Methods for the Examination of Water and Wastewater", 17th Edition, 1989. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 18th ed., "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, including "Supplement to the 18th Edition of Standard Methods for the Examination of Water and Wastewater", 1994. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 19th ed., "Standard Methods for the Examination of Water and Wastewater", 19th Edition, 1995, including "Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater", 1996. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 20th ed., "Standard Methods for the Examination of Water and Wastewater", 20th Edition, 1998. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 21st ed., "Standard Methods for the Examination of Water and Wastewater", 21st Edition, 2005. See the methods listed separately for the same references under American Waterworks Association.~~

~~Standard Methods, 22nd ed., "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012. See the methods listed separately for the same references under American Waterworks Association.~~

~~American Society for Microbiology, 1752 N Street N.W., Washington, DC 20036, 202-737-3600:~~

~~Enterolert, "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters", Applied and Environmental Microbiology, Oct. 1996, vol. 62, no. 10, p. 3881, referenced in Section 611.802.~~

~~BOARD NOTE: At the table to 40 CFR 141.402(c)(2), USEPA approved the method as described in the above literature review. The method itself is embodied in the printed instructions to the proprietary kit available from IDEXX Laboratories, Inc. (accessible on-line and available by download from www.asm.org, as "Enterolert™ Procedure"). ASTM approved the method as "Standard Test Method for Enterococci in Water Using Enterolert™", which is available in two versions from ASTM: ASTM Method D6503-99 (superseded) and ASTM Method D6503-99. While it is more conventional to incorporate the method as presented in the kit instructions or as approved by ASTM by reference, the Board is constrained to incorporate the version that appears in the technical literature by reference, which is the version that USEPA has explicitly approved.~~

~~AWWA. American Water Works Association et al., 6666 West Quincy Ave., Denver, CO 80235 (303-794-7711).~~

~~Standard Methods, 13th ed., "Standard Methods for the Examination of Water and Wastewater", 13th Edition, 1971.~~

~~Method 302, Gross Alpha and Gross Beta Radioactivity in Water (Total, Suspended, and Dissolved), referenced in Section 611.720.~~

~~Method 303, Total Radioactive Strontium and Strontium 90 in Water, referenced in Section 611.720.~~

~~Method 304, Radium in Water by Precipitation, referenced in Section 611.720.~~

~~Method 305, Radium 226 by Radon in Water (Soluble, Suspended, and Total), referenced in Section 611.720.~~

~~Method 306, Tritium in Water, referenced in Section 611.720.~~

~~Standard Methods, 17th ed., "Standard Methods for the Examination of Water and Wastewater", 17th Edition, 1989.~~

~~Method 7110 B, Gross Alpha and Gross Beta Radioactivity in Water (Total, Suspended, and Dissolved), referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium in Water, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium in Water by Precipitation, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium 226 by Radon in Water (Soluble, Suspended, and Total), referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method (Proposed), referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radioactive Strontium and Strontium 90 in Water, referenced in Section 611.720.~~

~~Method 7500-U B, Uranium, Radiochemical Method~~

~~(Proposed), referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method (Proposed), referenced in Section 611.720.~~

~~Standard Methods, 18th ed., "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992.~~

~~Method 2130 B, Turbidity, Nephelometric Method, referenced in Section 611.531.~~

~~Method 2320 B, Alkalinity, Titration Method, referenced in Section 611.611.~~

~~Method 2510 B, Conductivity, Laboratory Method, referenced in Section 611.611.~~

~~Method 2550, Temperature, Laboratory and Field Methods, referenced in Section 611.611.~~

~~Method 3111 B, Metals by Flame Atomic Absorption Spectrometry, Direct Air-Acetylene Flame Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3111 D, Metals by Flame Atomic Absorption Spectrometry, Direct Nitrous Oxide-Acetylene Flame Method, referenced in Section 611.611.~~

~~Method 3112 B, Metals by Cold-Vapor Atomic Absorption Spectrometry, Cold-Vapor Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3113 B, Metals by Electrothermal Atomic Absorption Spectrometry, Electrothermal Atomic Absorption Spectrometric Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3114 B, Metals by Hydride Generation/Atomic Absorption Spectrometry, Manual Hydride Generation/Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3120 B, Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3500-Ca D, Calcium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 3500-Mg E, Magnesium, Calculation Method, referenced in Section 611.611.~~

~~Method 4110 B, Determination of Anions by Ion Chromatography, Ion Chromatography with Chemical Suppression of Eluent Conductivity, referenced in Section 611.611.~~

~~Method 4500-Cl D, Chlorine, Amperometric Titration Method, referenced in Section 611.531.~~

~~Method 4500-Cl E, Chlorine, Low-Level Amperometric Titration Method, referenced in Section 611.531.~~

~~Method 4500-Cl F, Chlorine, DPD Ferrous Titrimetric Method, referenced in Section 611.531.~~

~~Method 4500-Cl G, Chlorine, DPD Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-Cl H, Chlorine, Syringaldazine (FACTS) Method, referenced in Section 611.531.~~

~~Method 4500-Cl I, Chlorine, Iodometric Electrode Method, referenced in Section 611.531.~~

~~Method 4500-ClO_2 C, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.531.~~

~~Method 4500-ClO_2 D, Chlorine Dioxide, DPD Method, referenced in Section 611.531.~~

~~Method 4500-ClO_2 E, Chlorine Dioxide, Amperometric Method II (Proposed), referenced in Section 611.531.~~

~~Method 4500-CN^- C, Cyanide, Total Cyanide after Distillation, referenced in Section 611.611.~~

~~Method 4500-CN^- E, Cyanide, Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-CN^- F, Cyanide, Cyanide-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-CN^- G, Cyanide, Cyanides Amenable to Chlorination after Distillation, referenced in Section 611.611.~~

~~Method 4500-F^- B, Fluoride, Preliminary Distillation Step, referenced in Section 611.611.~~

~~Method 4500-F^- C, Fluoride, Ion-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-F^- D, Fluoride, SPADNS Method, referenced in Section 611.611.~~

~~Method 4500-F^- E, Fluoride, Complexone Method, referenced in Section 611.611.~~

~~Method 4500-H^+ B, pH Value, Electrometric Method, referenced in Section 611.611.~~

~~Method 4500-NO_2^- B, Nitrogen (Nitrite), Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- D, Nitrogen (Nitrate), Nitrate Electrode Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- E, Nitrogen (Nitrate), Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- F, Nitrogen (Nitrate), Automated Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-O_3 B, Ozone (Residual) (Proposed), Indigo Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-P E, Phosphorus, Ascorbic Acid Method, referenced in Section 611.611.~~

~~Method 4500-P F, Phosphorus, Automated Ascorbic Acid Reduction Method, referenced in Section 611.611.~~

~~Method 4500-Si D, Silica, Molybdosilicate Method, referenced in Section 611.611.~~

~~Method 4500-Si E, Silica, Heteropoly Blue Method, referenced in Section 611.611.~~

~~Method 4500-Si F, Silica, Automated Method for Molybdate-Reactive Silica, referenced in Section 611.611.~~

~~Method 6651 B, Glyphosate Herbicide (Proposed), referenced in Section 611.645.~~

~~Method 7110 B, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Evaporation Method for Gross Alpha-Beta, referenced in Section 611.720.~~

~~Method 7110 C, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed), referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium, Liquid Scintillation Spectrometric Method, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium, Emanation Method, referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method (Proposed), referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radioactive Strontium and Strontium 90, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-U B, Uranium, Radiochemical Method (Proposed), referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method (Proposed), referenced in Section 611.720.~~

~~Method 9215 B, Heterotrophic Plate Count, Pour Plate Method, referenced in Section 611.531.~~

~~Method 9221 A, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Introduction,~~

~~referenced in Section 611.531.~~

~~Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Section 611.531.~~

~~Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Section 611.531.~~

~~Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Section 611.531.~~

~~Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 D, Membrane Filter Technique for Members of the Coliform Group, Fecal Coliform Membrane Filter Procedure, referenced in Section 611.531.~~

~~Method 9223, Chromogenic Substrate Coliform Test (Proposed) (also referred to as the variations “Colilert® Test” and “Colisure™ Test”), referenced in Section 611.531.~~

~~Method 9223 B, Chromogenic Substrate Coliform Test (Proposed), referenced in Section 611.1004.~~

~~“Supplement to the 18th Edition of Standard Methods for the Examination of Water and Wastewater”, American Public Health Association, 1994.~~

~~Method 6610, Carbamate Pesticide Method, referenced in Section 611.645.~~

~~Standard Methods, 19th ed., “Standard Methods for the Examination of Water and Wastewater”, 19th Edition, 1995.~~

~~Method 2130 B, Turbidity, Nephelometric Method, referenced in Section 611.531.~~

~~Method 2320 B, Alkalinity, Titration Method, referenced in Section 611.611.~~

~~Method 2510 B, Conductivity, Laboratory Method, referenced in Section 611.611.~~

~~Method 2550, Temperature, Laboratory, and Field Methods, referenced in Section 611.611.~~

~~Method 3111 B, Metals by Flame Atomic Absorption Spectrometry, Direct Air-Acetylene Flame Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3111 D, Metals by Flame Atomic Absorption Spectrometry, Direct Nitrous Oxide-Acetylene Flame Method, referenced in Section 611.611.~~

~~Method 3112 B, Metals by Cold-Vapor Atomic Absorption Spectrometry, Cold-Vapor Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3113 B, Metals by Electrothermal Atomic Absorption Spectrometry, Electrothermal Atomic Absorption Spectrometric Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3114 B, Metals by Hydride Generation/Atomic Absorption Spectrometry, Manual Hydride Generation/Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3120 B, Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3500-Ca D, Calcium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 3500-Mg E, Magnesium, Calculation Method, referenced in Section 611.611.~~

~~Method 4110 B, Determination of Anions by Ion Chromatography, Ion Chromatography with Chemical Suppression of Eluent Conductivity, referenced in Section 611.611.~~

~~Method 4500-Cl D, Chlorine, Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl E, Chlorine, Low-Level Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl F, Chlorine, DPD Ferrous Titrimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl G, Chlorine, DPD Colorimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl H, Chlorine, Syringaldazine (FACTS) Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl I, Chlorine, Iodometric Electrode Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 C, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.531.~~

~~Method 4500-ClO_2 D, Chlorine Dioxide, DPD Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 E, Chlorine Dioxide, Amperometric Method II, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-CN^- C, Cyanide, Total Cyanide after Distillation, referenced in Section 611.611.~~

~~Method 4500-CN^- E, Cyanide, Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-CN^- F, Cyanide, Cyanide-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-CN^- G, Cyanide, Cyanides Amenable to Chlorination after Distillation, referenced in Section 611.611.~~

~~Method 4500-F^- B, Fluoride, Preliminary Distillation Step, referenced in Section 611.611.~~

~~Method 4500-F^- C, Fluoride, Ion-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-F^- D, Fluoride, SPADNS Method, referenced~~

~~in Section 611.611.~~

~~Method 4500-F^- E, Fluoride, Complexone Method, referenced in Section 611.611.~~

~~Method 4500-H^+ B, pH Value, Electrometric Method, referenced in Section 611.611.~~

~~Method 4500-NO_2^- B, Nitrogen (Nitrite), Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- D, Nitrogen (Nitrate), Nitrate Electrode Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- E, Nitrogen (Nitrate), Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- F, Nitrogen (Nitrate), Automated Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-O_3 B, Ozone (Residual) (Proposed), Indigo Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-P E, Phosphorus, Ascorbic Acid Method, referenced in Section 611.611.~~

~~Method 4500-P F, Phosphorus, Automated Ascorbic Acid Reduction Method, referenced in Section 611.611.~~

~~Method 4500-Si D, Silica, Molybdosilicate Method, referenced in Section 611.611.~~

~~Method 4500-Si E, Silica, Heteropoly Blue Method, referenced in Section 611.611.~~

~~Method 4500-Si F, Silica, Automated Method for Molybdate-Reactive Silica, referenced in Section 611.611.~~

~~Method 5910 B, UV Absorbing Organic Constituents, Ultraviolet Absorption Method, referenced in Section 611.381.~~

~~Method 6251 B, Disinfection Byproducts: Haloacetic Acids and Trichlorophenol, Micro Liquid-Liquid Extraction Gas Chromatographic Method, referenced in Section 611.381.~~

~~Method 6610, Carbamate Pesticide Method, referenced in~~

~~Section 611.645.~~

~~Method 6651 B, Glyphosate Herbicide, referenced in Section 611.645.~~

~~Method 7110 B, Gross Alpha and Gross Beta Radioactivity, Evaporation Method for Gross Alpha-Beta, referenced in Section 611.720.~~

~~Method 7110 C, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed), referenced in Section 611.720.~~

~~Method 7120, Gamma-Emitting Radionuclides, referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium, Liquid Scintillation Spectrometric Method, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium, Emanation Method, referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radiactive Strontium and Strontium 90, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-U B, Uranium, Radiochemical Method, referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method, referenced in Section 611.720.~~

~~Method 9215 B, Heterotrophic Plate Count, Pour Plate Method, referenced in Section 611.531.~~

~~Method 9221 A, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Section 611.531.~~

~~Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Section 611.531.~~

~~Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Section 611.531.~~

~~Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 D, Membrane Filter Technique for Members of the Coliform Group, Fecal Coliform Membrane Filter Procedure, referenced in Section 611.531.~~

~~Method 9223, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test" and "Colisure™ Test"), referenced in Section 611.531.~~

~~Method 9223 B, Chromogenic Substrate Coliform Test (Proposed), referenced in Section 611.1004.~~

~~"Supplement to the 19th Edition of Standard Methods for the Examination of Water and Wastewater", American Public Health~~

~~Association, 1996.~~

~~Method 5310 B, TOC, Combustion-Infrared Method, referenced in Section 611.381.~~

~~Method 5310 C, TOC, Persulfate-Ultraviolet Oxidation Method, referenced in Section 611.381.~~

~~Method 5310 D, TOC, Wet-Oxidation Method, referenced in Section 611.381.~~

~~Standard Methods, 20th ed., "Standard Methods for the Examination of Water and Wastewater", 20th Edition, 1998.~~

~~Method 2130 B, Turbidity, Nephelometric Method, referenced in Section 611.531.~~

~~Method 2320 B, Alkalinity, Titration Method, referenced in Section 611.611.~~

~~Method 2510 B, Conductivity, Laboratory Method, referenced in Section 611.611.~~

~~Method 2550, Temperature, Laboratory, and Field Methods, referenced in Section 611.611.~~

~~Method 3120 B, Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3125, Metals by Inductively Coupled Plasma/Mass Spectrometry, referenced in Section 611.720.~~

~~Method 3500-Ca B, Calcium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 3500-Mg B, Magnesium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 4110 B, Determination of Anions by Ion Chromatography, Ion Chromatography with Chemical Suppression of Eluent Conductivity, referenced in Section 611.611.~~

~~Method 4500-Cl D, Chlorine, Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl E, Chlorine, Low-Level Amperometric~~

~~Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl F, Chlorine, DPD Ferrous Titrimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl G, Chlorine, DPD Colorimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl H, Chlorine, Syringaldazine (FACTS) Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl I, Chlorine, Iodometric Electrode Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 C, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.531.~~

~~Method 4500-ClO_2 D, Chlorine Dioxide, DPD Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 E, Chlorine Dioxide, Amperometric Method II (Proposed), referenced in Sections 611.381 and 611.531.~~

~~Method 4500-CN^- C, Cyanide, Total Cyanide after Distillation, referenced in Section 611.611.~~

~~Method 4500-CN^- E, Cyanide, Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-CN^- F, Cyanide, Cyanide-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-CN^- G, Cyanide, Cyanides Amenable to Chlorination after Distillation, referenced in Section 611.611.~~

~~Method 4500-F^- B, Fluoride, Preliminary Distillation Step, referenced in Section 611.611.~~

~~Method 4500-F^- C, Fluoride, Ion-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-F^- D, Fluoride, SPADNS Method, referenced in Section 611.611.~~

~~Method 4500-F^- E, Fluoride, Complexone Method,~~

~~referenced in Section 611.611.~~

~~Method 4500-H^+ B, pH Value, Electrometric Method, referenced in Section 611.611.~~

~~Method 4500-NO_2^- B, Nitrogen (Nitrite), Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- D, Nitrogen (Nitrate), Nitrate Electrode Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- E, Nitrogen (Nitrate), Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- F, Nitrogen (Nitrate), Automated Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-O_3 B, Ozone (Residual) (Proposed), Indigo Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-P E, Phosphorus, Ascorbic Acid Method, referenced in Section 611.611.~~

~~Method 4500-P F, Phosphorus, Automated Ascorbic Acid Reduction Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 C, Silica, Molybdosilicate Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 D, Silica, Heteropoly Blue Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 E, Silica, Automated Method for Molybdate-Reactive Silica, referenced in Section 611.611.~~

~~Method 5310 B, TOC, Combustion-Infrared Method, referenced in Section 611.381.~~

~~Method 5310 C, TOC, Persulfate-Ultraviolet Oxidation Method, referenced in Section 611.381.~~

~~Method 5310 D, TOC, Wet-Oxidation Method, referenced in Section 611.381.~~

~~Method 5910 B, UV-Absorbing Organic Constituents, Ultraviolet Absorption Method, referenced in Section 611.381.~~

~~Method 6251 B, Disinfection By-Products: Haloacetic Acids and Trichlorophenol, Micro Liquid-Liquid Extraction Gas Chromatographic Method, referenced in Section 611.381.~~

~~Method 6610, Carbamate Pesticide Method, referenced in Section 611.645.~~

~~Method 6651 B, Glyphosate Herbicide, Liquid Chromatographic Post-Column Fluorescence Method, referenced in Section 611.645.~~

~~Method 7110 B, Gross Alpha and Gross Beta Radioactivity, Evaporation Method for Gross Alpha-Beta, referenced in Section 611.720.~~

~~Method 7110 C, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed), referenced in Section 611.720.~~

~~Method 7120, Gamma-Emitting Radionuclides, referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium, Liquid Scintillation Spectrometric Method, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium, Emanation Method, referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radioactive Strontium and Strontium 90, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-U B, Uranium, Radiochemical Method, referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method, referenced in Section 611.720.~~

~~Method 9060 A, Samples, Collection, referenced in Section 611.1052.~~

~~Method 9215 B, Heterotrophic Plate Count, Pour Plate Method, referenced in Section 611.531.~~

~~Method 9221 A, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Sections 611.531, 611.802, and 611.1052.~~

~~Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Sections 611.531 and 611.1052.~~

~~Method 9221 D, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Presence-Absence (P-A) Coliform Test, referenced in Sections 611.802 and 611.1052.~~

~~Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Section 611.531.~~

~~Method 9221 F, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Escherichia Coli Procedure (Proposed), referenced in Sections 611.802 and 611.1052.~~

~~Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Sections 611.531, 611.802, and 611.1052.~~

~~Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Sections 611.531, 611.802, and 611.1052.~~

~~Method 9222 D, Membrane Filter Technique for Members of the Coliform Group, Fecal Coliform Membrane Filter Procedure, referenced in Sections 611.531 and 611.1004.~~

~~Method 9222 G, Membrane Filter Technique for Members of the Coliform Group, MF Partition Procedures, referenced in Sections 611.802, 611.1004, and 611.1052.~~

~~Method 9223, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test," "Colisure™ Test," and Colilert-18® Test), referenced in Section 611.531.~~

~~Method 9223 B, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test" and "Colisure™ Test"), referenced in Sections 611.802, 611.1004, and 611.1052.~~

~~Method 9230 B, Fecal Streptococcus and Enterococcus Groups, Multiple Tube Techniques, referenced in Section 611.802.~~

~~Method 9230 C, Fecal Streptococcus and Enterococcus Groups, Membrane Filter Techniques, referenced in Section 611.802.~~

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~~Method 2130 B, Turbidity, Nephelometric Method, referenced in Section 611.531.~~

~~Method 2320 B, Alkalinity, Titration Method, referenced in Section 611.611.~~

~~Method 2510 B, Conductivity, Laboratory Method, referenced in Section 611.611.~~

~~Method 2550, Temperature, Laboratory, and Field Methods, referenced in Section 611.611.~~

~~Method 3111 B, Metals by Flame Atomic Absorption Spectrometry, Direct Air-Acetylene Flame Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3111 D, Metals by Flame Atomic Absorption Spectrometry, Direct Nitrous Oxide-Acetylene Flame Method, referenced in Section 611.611.~~

~~Method 3112 B, Metals by Cold-Vapor Atomic Absorption Spectrometry, Cold-Vapor Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3113 B, Metals by Electrothermal Atomic Absorption Spectrometry, Electrothermal Atomic Absorption Spectrometric Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3114 B, Metals by Hydride Generation/Atomic Absorption Spectrometry, Manual Hydride Generation/Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3120 B, Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3125, Metals by Inductively Coupled Plasma/Mass Spectrometry, referenced in Section 611.720.~~

~~Method 3500-Ca B, Calcium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 3500-Mg B, Magnesium, Calculation Method, referenced in Section 611.611.~~

~~Method 4110 B, Determination of Anions by Ion Chromatography, Ion Chromatography with Chemical Suppression of Eluent Conductivity, referenced in Section 611.611.~~

~~Method 4500-Cl D, Chlorine, Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl E, Chlorine, Low-Level Amperometric Titration Method, referenced in Sections 611.381 and~~

~~611.531.~~

~~Method 4500-Cl F, Chlorine, DPD Ferrous Titrimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl G, Chlorine, DPD Colorimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl H, Chlorine, Syringaldazine (FACTS) Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl I, Chlorine, Iodometric Electrode Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 C, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.531.~~

~~Method 4500-ClO_2 D, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.381.~~

~~Method 4500-ClO_2 E, Chlorine Dioxide, Amperometric Method II (Proposed), referenced in Sections 611.381 and 611.531.~~

~~Method 4500-CN^- E, Cyanide, Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-CN^- F, Cyanide, Cyanide-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-CN^- G, Cyanide, Cyanides Amenable to Chlorination after Distillation, referenced in Section 611.611.~~

~~Method 4500-F^- B, Fluoride, Preliminary Distillation Step, referenced in Section 611.611.~~

~~Method 4500-F^- C, Fluoride, Ion-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-F^- D, Fluoride, SPADNS Method, referenced in Section 611.611.~~

~~Method 4500-F^- E, Fluoride, Complexone Method, referenced in Section 611.611.~~

~~Method 4500-H^+ B, pH Value, Electrometric Method, referenced in Section 611.611.~~

~~Method 4500-NO_2^- B, Nitrogen (Nitrite), Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- D, Nitrogen (Nitrate), Nitrate Electrode Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- E, Nitrogen (Nitrate), Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- F, Nitrogen (Nitrate), Automated Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-O_3 B, Ozone (Residual) (Proposed), Indigo Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-P E, Phosphorus, Ascorbic Acid Method, referenced in Section 611.611.~~

~~Method 4500-P F, Phosphorus, Automated Ascorbic Acid Reduction Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 C, Silica, Molybdosilicate Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 D, Silica, Heteropoly Blue Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 E, Silica, Automated Method for Molybdate-Reactive Silica, referenced in Section 611.611.~~

~~Method 5310 B, TOC, Combustion-Infrared Method, referenced in Section 611.381.~~

~~Method 5310 C, TOC, Persulfate-Ultraviolet Oxidation Method, referenced in Section 611.381.~~

~~Method 5310 D, TOC, Wet-Oxidation Method, referenced in Section 611.381.~~

~~Method 5910 B, UV-Absorbing Organic Constituents, Ultraviolet Absorption Method, referenced in Section 611.381.~~

~~Method 6251 B, Disinfection By-Products: Haloacetic Acids and Trichlorophenol, Micro Liquid-Liquid Extraction Gas Chromatography Method, referenced in Section 611.381.~~

~~Method 6610 B, Carbamate Pesticide Method, High-Performance Liquid Chromatographic Method, referenced in Section 611.645.~~

~~Method 6640 B, Acidic Herbicide Compounds, Micro Liquid-Liquid Extraction Gas Chromatographic Method, referenced in Section 611.645.~~

~~Method 6651 B, Glyphosate Herbicide, Liquid Chromatographic Post-Column Fluorescence Method, referenced in Section 611.645.~~

~~Method 7110 B, Gross Alpha and Gross Beta Radioactivity, Evaporation Method for Gross Alpha-Beta, referenced in Section 611.720.~~

~~Method 7110 C, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed), referenced in Section 611.720.~~

~~Method 7120, Gamma-Emitting Radionuclides, referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium, Liquid Scintillation Spectrometric Method, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium, Emanation Method, referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radioactive Strontium and Strontium 90, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-U B, Uranium, Radiochemical Method, referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method, referenced in Section 611.720.~~

~~Method 9060 A, Samples, Collection, referenced in Section 611.1052.~~

~~Method 9215 B, Heterotrophic Plate Count, Pour Plate Method, referenced in Section 611.531.~~

~~Method 9221 A, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Sections 611.531 and 611.1052.~~

~~Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Section 611.531.~~

~~Method 9221 D, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Presence-Absence (P-A) Coliform Test, referenced in Sections 611.802 and 611.1052.~~

~~Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Sections 611.531 and 611.1052.~~

~~Method 9222 C, Membrane Filter Technique for Members~~

~~of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Sections 611.531, 611.802, and 611.1052.~~

~~Method 9222 D, Membrane Filter Technique for Members of the Coliform Group, Fecal Coliform Membrane Filter Procedure, referenced in Sections 611.531 and 611.1052.~~

~~Method 9222 G, Membrane Filter Technique for Members of the Coliform Group, MF Partition Procedures, referenced in Section 611.1052.~~

~~Method 9223, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test" and "Colisure™ Test"), referenced in Section 611.531.~~

~~Method 9223 B, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test", "Colisure™ Test", and "Colilert-18® Test", based on the particular medium used, available from IDEXX Laboratories, Inc.), referenced in Sections 611.531, 611.802, and 611.1052.~~

~~BOARD NOTE: See the Board note appended to Standard Methods Online in this Section about methods that appear in Standard Methods, 21st ed. which USEPA has cited as available from Standard Methods Online.~~

~~Standard Methods, 22nd ed., "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012, for the specified methods, as modified by "22nd Edition of Standard Methods for the Examination of Water and Wastewater ERRATA" dated December 16, 2013 and available online for free download at www.standardmethods.org/PDF/22nd_Ed_Errata_12_16_13.pdf.~~

~~Method 2130 B, Turbidity, Nephelometric Method, referenced in Section 611.531.~~

~~Method 2320 B, Alkalinity, Titration Method, referenced in Section 611.611.~~

~~Method 2510 B, Conductivity, Laboratory Method, referenced in Section 611.611.~~

~~Method 2550, Temperature, Laboratory, and Field Methods, referenced in Section 611.611.~~

~~Method 3111 B, Metals by Flame Atomic Absorption~~

~~Spectrometry, Direct Air-Acetylene Flame Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3111 D, Metals by Flame Atomic Absorption Spectrometry, Direct Nitrous Oxide-Acetylene Flame Method, referenced in Section 611.611.~~

~~Method 3112 B, Metals by Cold-Vapor Atomic Absorption Spectrometry, Cold-Vapor Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3113 B, Metals by Electrothermal Atomic Absorption Spectrometry, Electrothermal Atomic Absorption Spectrometric Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3114 B, Metals by Hydride Generation/Atomic Absorption Spectrometry, Manual Hydride Generation/Atomic Absorption Spectrometric Method, referenced in Section 611.611.~~

~~Method 3120 B, Metals by Plasma Emission Spectroscopy, Inductively Coupled Plasma (ICP) Method, referenced in Sections 611.611 and 611.612.~~

~~Method 3500-Ca B, Calcium, EDTA Titrimetric Method, referenced in Section 611.611.~~

~~Method 3500-Mg B, Magnesium, Calculation Method, referenced in Section 611.611.~~

~~Method 4110 B, Determination of Anions by Ion Chromatography, Ion Chromatography with Chemical Suppression of Eluent Conductivity, referenced in Section 611.611.~~

~~Method 4500-Cl D, Chlorine, Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl E, Chlorine, Low-Level Amperometric Titration Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl F, Chlorine, DPD Ferrous Titrimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl G, Chlorine, DPD Colorimetric Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl H, Chlorine, Syringaldazine (FACTS) Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-Cl I, Chlorine, Iodometric Electrode Method, referenced in Sections 611.381 and 611.531.~~

~~Method 4500-ClO_2 C, Chlorine Dioxide, Amperometric Method I, referenced in Section 611.531.~~

~~Method 4500-ClO_2 E, Chlorine Dioxide, Amperometric Method II (Proposed), referenced in Sections 611.381 and 611.531.~~

~~Method 4500-CN^- E, Cyanide, Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-CN^- F, Cyanide, Cyanide-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-CN^- G, Cyanide, Cyanides Amenable to Chlorination after Distillation, referenced in Section 611.611.~~

~~Method 4500-F^- B, Fluoride, Preliminary Distillation Step, referenced in Section 611.611.~~

~~Method 4500-F^- C, Fluoride, Ion-Selective Electrode Method, referenced in Section 611.611.~~

~~Method 4500-F^- D, Fluoride, SPADNS Method, referenced in Section 611.611.~~

~~Method 4500-F^- E, Fluoride, Complexone Method, referenced in Section 611.611.~~

~~Method 4500-H^+ B, pH Value, Electrometric Method, referenced in Section 611.611.~~

~~Method 4500-NO_2^- B, Nitrogen (Nitrite), Colorimetric Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- D, Nitrogen (Nitrate), Nitrate Electrode Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- E, Nitrogen (Nitrate), Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-NO_3^- F, Nitrogen (Nitrate), Automated~~

~~Cadmium Reduction Method, referenced in Section 611.611.~~

~~Method 4500-O_3 B, Ozone (Residual) (Proposed), Indigo Colorimetric Method, referenced in Section 611.531.~~

~~Method 4500-P E, Phosphorus, Ascorbic Acid Method, referenced in Section 611.611. Modified by the above-cited errata sheet.~~

~~Method 4500-P F, Phosphorus, Automated Ascorbic Acid Reduction Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 C, Silica, Molybdosilicate Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 D, Silica, Heteropoly Blue Method, referenced in Section 611.611.~~

~~Method 4500-SiO_2 E, Silica, Automated Method for Molybdate-Reactive Silica, referenced in Section 611.611.~~

~~Method 5310 B, TOC, Combustion-Infrared Method, referenced in Section 611.381.~~

~~Method 5310 C, TOC, Persulfate-Ultraviolet Oxidation Method, referenced in Section 611.381.~~

~~Method 5310 D, TOC, Wet-Oxidation Method, referenced in Section 611.381.~~

~~Method 5910 B, UV-Absorbing Organic Constituents, Ultraviolet Absorption Method, referenced in Section 611.381.~~

~~Method 6251 B, Disinfection By-Products: Haloacetic Acids and Trichlorophenol, referenced in Section 611.381.~~

~~Method 6610 B, Carbamate Pesticide Method, High-Performance Liquid Chromatographic Method, referenced in Section 611.645.~~

~~Method 6640 B, Acidic Herbicide Compounds, Micro Liquid-Liquid Extraction Gas Chromatographic Method, referenced in Section 611.645.~~

~~Method 6651 B, Glyphosate Herbicide, Liquid Chromatographic Post-Column Fluorescence Method,~~

~~referenced in Section 611.645.~~

~~Method 7110 B, Gross Alpha and Gross Beta Radioactivity, Evaporation Method for Gross Alpha-Beta, referenced in Section 611.720.~~

~~Method 7110 C, Gross Alpha and Beta Radioactivity (Total, Suspended, and Dissolved), Coprecipitation Method for Gross Alpha Radioactivity in Drinking Water (Proposed), referenced in Section 611.720. Modified by the above-cited errata sheet.~~

~~Method 7120, Gamma-Emitting Radionuclides, referenced in Section 611.720.~~

~~Method 7500-Cs B, Radioactive Cesium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-^{3}H B, Tritium, Liquid Scintillation Spectrometric Method, referenced in Section 611.720.~~

~~Method 7500-I B, Radioactive Iodine, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-I C, Radioactive Iodine, Ion-Exchange Method, referenced in Section 611.720.~~

~~Method 7500-I D, Radioactive Iodine, Distillation Method, referenced in Section 611.720.~~

~~Method 7500-Ra B, Radium, Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra C, Radium, Emanation Method, referenced in Section 611.720.~~

~~Method 7500-Ra D, Radium, Sequential Precipitation Method, referenced in Section 611.720.~~

~~Method 7500-Ra E, Radium, Gamma Spectrometry Method, referenced in Section 611.720.~~

~~Method 7500-Sr B, Total Radioactive Strontium and Strontium 90, Precipitation Method, referenced in Section 611.720. Modified by the above-cited errata sheet.~~

~~Method 7500-U B, Uranium, Radiochemical Method, referenced in Section 611.720.~~

~~Method 7500-U C, Uranium, Isotopic Method, referenced in Section 611.720.~~

~~Method 9215 B, Heterotrophic Plate Count, Pour Plate Method, referenced in Section 611.531.~~

~~Method 9221 A, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Sections 611.531 and 611.1052.~~

~~Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Section 611.531. Modified by the above-cited errata sheet.~~

~~Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Section 611.531.~~

~~Method 9221 F, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Escherichia Coli Procedure (Proposed), referenced in Section 611.802 and 611.1052.~~

~~Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Section 611.531.~~

~~Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Section 611.531. Modified by the above-cited errata sheet.~~

~~Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Section 611.531.~~

~~Method 9222 D, Membrane Filter Technique for Members of the Coliform Group, Fecal Coliform Membrane Filter Procedure, referenced in Section 611.531.~~

~~Method 9223, Chromogenic Substrate Coliform Test (also referred to as the variations "Colilert® Test" and~~

~~“Colisure™ Test”), referenced in Section 611.531.~~

~~Method 9223 B, Chromogenic Substrate Coliform Test (also referred to as the variations “Colilert® Test”, “Colisure™ Test”, and “Colilert-18® Test”, based on the particular medium used, available from IDEXX Laboratories, Inc.), referenced in Sections 611.802, 611.1004, and 611.1052.~~

~~BOARD NOTE: See the Board note appended to Standard Methods Online in this Section about methods that appear in Standard Methods, 22nd ed., which USEPA has cited as available from Standard Methods Online.~~

~~BOARD NOTE: Individual Methods from Standard Methods are available online from Standard Methods Online.~~

~~ASTM. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 (610-832-9585).~~

~~ASTM Method D511-93 A and B, “Standard Test Methods for Calcium and Magnesium in Water”, “Test Method A — Complexometric Titration” and “Test Method B — Atomic Absorption Spectrophotometric”, approved 1993, referenced in Section 611.611.~~

~~ASTM Method D511-03 A and B, “Standard Test Methods for Calcium and Magnesium in Water”, “Test Method A — Complexometric Titration” and “Test Method B — Atomic Absorption Spectrophotometric”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D511-09 A and B, “Standard Test Methods for Calcium and Magnesium in Water”, “Test Method A — Complexometric Titration” and “Test Method B — Atomic Absorption Spectrophotometric”, approved 2009, referenced in Section 611.611.~~

~~ASTM Method D511-14 A and B, “Standard Test Methods for Calcium and Magnesium in Water”, “Test Method A — Complexometric Titration” and “Test Method B — Atomic Absorption Spectrophotometric”, approved 2014, referenced in Section 611.611.~~

~~ASTM Method D515-88 A, “Standard Test Methods for Phosphorus in Water”, “Test Method A — Colorimetric Ascorbic Acid Reduction”, approved August 19, 1988, referenced in Section 611.611.~~

~~ASTM Method D859-94, "Standard Test Method for Silica in Water", approved 1994, referenced in Section 611.611.~~

~~ASTM Method D859-00, "Standard Test Method for Silica in Water", approved 2000, referenced in Section 611.611.~~

~~ASTM Method D859-05, "Standard Test Method for Silica in Water", approved 2005, referenced in Section 611.611.~~

~~ASTM Method D859-10, "Standard Test Method for Silica in Water", approved 2010, referenced in Section 611.611.~~

~~ASTM Method D1067-92 B, "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved May 15, 1992, referenced in Section 611.611.~~

~~ASTM Method D1067-02 B, "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2002, referenced in Section 611.611.~~

~~ASTM Method D1067-06 B, "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2006, referenced in Section 611.611.~~

~~ASTM Method D1067-11 B, "Standard Test Methods for Acidity or Alkalinity in Water", "Test Method B—Electrometric or Color-Change Titration", approved in 2011, referenced in Section 611.611.~~

~~ASTM Method D1125-95(1999) A, "Standard Test Methods for Electrical Conductivity and Resistivity of Water", "Test Method A—Field and Routine Laboratory Measurement of Static (Non-Flowing) Samples", approved 1995, reapproved 1999, referenced in Section 611.611.~~

~~ASTM Method D1179-93 B, "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 1993, referenced in Section 611.611.~~

~~ASTM Method D1179-99 B, "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved 1999, referenced in Section 611.611.~~

~~ASTM Method D1179-04 B, "Standard Test Methods for Fluoride in Water", "Test Method B—Ion Selective Electrode", approved~~

~~2004, referenced in Section 611.611.~~

~~ASTM Method D1179-10 B, “Standard Test Methods for Fluoride in Water”, “Test Method B—Ion Selective Electrode”, approved 2010, referenced in Section 611.611.~~

~~ASTM Method D1253-86, “Standard Test Method for Residual Chlorine in Water”, reapproved 1992, referenced in Section 611.381.~~

~~ASTM Method D1253-96, “Standard Test Method for Residual Chlorine in Water”, approved 1996, referenced in Section 611.381.~~

~~ASTM Method D1253-03, “Standard Test Method for Residual Chlorine in Water”, approved 2003, referenced in Sections 611.381 and 611.531.~~

~~ASTM Method D1253-08, “Standard Test Method for Residual Chlorine in Water”, approved 2008, referenced in Sections 611.381 and 611.531.~~

~~ASTM Method D1253-14, “Standard Test Method for Residual Chlorine in Water”, approved 2014, referenced in Sections 611.381 and 611.531.~~

~~ASTM Method D1293-95, “Standard Test Methods for pH of Water”, approved 1995, referenced in Section 611.611.~~

~~ASTM Method D1293-99, “Standard Test Methods for pH of Water”, approved 1999, referenced in Section 611.611.~~

~~ASTM Method D1293-12, “Standard Test Methods for pH of Water”, approved 2012, referenced in Section 611.611.~~

~~ASTM Method D1688-95 A and C, “Standard Test Methods for Copper in Water”, “Test Method A—Atomic Absorption, Direct” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 1995, referenced in Section 611.611.~~

~~ASTM Method D1688-02 A and C, “Standard Test Methods for Copper in Water”, “Test Method A—Atomic Absorption, Direct” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2002, referenced in Section 611.611.~~

~~ASTM Method D1688-07 A and C, “Standard Test Methods for Copper in Water”, “Test Method A—Atomic Absorption, Direct” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2007, referenced in Section 611.611.~~

~~ASTM Method D1688-12 A and C, “Standard Test Methods for Copper in Water”, “Test Method A—Atomic Absorption, Direct” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2012, referenced in Section 611.611.~~

~~ASTM Method D2036-98 A and B, “Standard Test Methods for Cyanide in Water”, “Test Method A—Total Cyanides after Distillation” and “Test Method B—Cyanides Amenable to Chlorination by Difference”, approved 1998, referenced in Section 611.611.~~

~~ASTM Method D2036-06 A and B, “Standard Test Methods for Cyanide in Water”, “Test Method A—Total Cyanides after Distillation” and “Test Method B—Cyanides Amenable to Chlorination by Difference”, approved 2006, referenced in Section 611.611.~~

~~ASTM Method D2459-72, “Standard Test Method for Gamma Spectrometry in Water”, approved July 28, 1972, discontinued 1988, referenced in Section 611.720.~~

~~ASTM Method D2460-97, “Standard Test Method for Radionuclides of Radium in Water”, approved 1997, referenced in Section 611.720.~~

~~ASTM Method D2460-07, “Standard Test Method for Radionuclides of Radium in Water”, approved 2007, referenced in Section 611.720.~~

~~ASTM Method D2907-97, “Standard Test Methods for Microquantities of Uranium in Water by Fluorometry”, approved 1997, referenced in Section 611.720.~~

~~ASTM Method D2972-97 B and C, “Standard Test Methods for Arsenic in Water”, “Test Method B—Atomic Absorption, Hydride Generation” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 1997, referenced in Section 611.611.~~

~~ASTM Method D2972-03 B and C, “Standard Test Methods for Arsenic in Water”, “Test Method B—Atomic Absorption, Hydride Generation” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D2972-08 B and C, “Standard Test Methods for Arsenic in Water”, “Test Method B—Atomic Absorption, Hydride Generation” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.~~

~~ASTM Method D2972-15 B and C, “Standard Test Methods for Arsenic in Water”, “Test Method B—Atomic Absorption, Hydride Generation” and “Test Method C—Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.~~

~~ASTM Method D3223-97, “Standard Test Method for Total Mercury in Water”, approved 1997, referenced in Section 611.611.~~

~~ASTM Method D3223-02, “Standard Test Method for Total Mercury in Water”, approved 2002, referenced in Section 611.611.~~

~~ASTM Method D3223-12, “Standard Test Method for Total Mercury in Water”, approved 2012, referenced in Section 611.611.~~

~~ASTM Method D3454-97, “Standard Test Method for Radium-226 in Water”, approved 1997, referenced in Section 611.720.~~

~~ASTM Method D3454-05, “Standard Test Method for Radium-226 in Water”, approved 2005, referenced in Section 611.720.~~

~~ASTM Method D3559-96 D, “Standard Test Methods for Lead in Water”, “Test Method D—Atomic Absorption, Graphite Furnace”, approved August 6, 1990, referenced in Section 611.611.~~

~~ASTM Method D3559-03 D, “Standard Test Methods for Lead in Water”, “Test Method D—Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D3559-08 D, “Standard Test Methods for Lead in Water”, “Test Method D—Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.~~

~~ASTM Method D3559-15 D, “Standard Test Methods for Lead in Water”, “Test Method D—Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.~~

~~ASTM Method D3645-97 B, “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 1997, referenced in Section 611.611.~~

~~ASTM Method D3645-03 B, “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D3645-08 B, “Standard Test Methods for Beryllium in Water”, “Method B—Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.~~

~~ASTM Method D3645-15 B, “Standard Test Methods for Beryllium in Water”, “Method B — Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.~~

~~ASTM Method D3649-91, “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 1991, referenced in Section 611.720.~~

~~ASTM Method D3649-98a, “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 1998, referenced in Section 611.720.~~

~~ASTM Method D3649-06, “Standard Test Method for High-Resolution Gamma-Ray Spectrometry of Water”, approved 2006, referenced in Section 611.720.~~

~~ASTM Method D3697-92, “Standard Test Method for Antimony in Water”, approved 1992, referenced in Section 611.611.~~

~~ASTM Method D3697-02, “Standard Test Method for Antimony in Water”, approved 2002, referenced in Section 611.611.~~

~~ASTM Method D3697-07, “Standard Test Method for Antimony in Water”, approved 2007, referenced in Section 611.611.~~

~~ASTM Method D3697-12, “Standard Test Method for Antimony in Water”, approved 2012, referenced in Section 611.611.~~

~~ASTM Method D3859-98 A and B, “Standard Test Methods for Selenium in Water”, “Method A — Atomic Absorption, Hydride Method” and “Method B — Atomic Absorption, Graphite Furnace”, approved 1998, referenced in Section 611.611.~~

~~ASTM Method D3859-03 A and B, “Standard Test Methods for Selenium in Water”, “Method A — Atomic Absorption, Hydride Method” and “Method B — Atomic Absorption, Graphite Furnace”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D3859-08 A and B, “Standard Test Methods for Selenium in Water”, “Method A — Atomic Absorption, Hydride Method” and “Method B — Atomic Absorption, Graphite Furnace”, approved 2008, referenced in Section 611.611.~~

~~ASTM Method D3859-15 A and B, “Standard Test Methods for Selenium in Water”, “Method A — Atomic Absorption, Hydride Method” and “Method B — Atomic Absorption, Graphite Furnace”, approved 2015, referenced in Section 611.611.~~

~~ASTM Method D3867-90 A and B, “Standard Test Methods for Nitrite-Nitrate in Water”, “Test Method A—Automated Cadmium Reduction” and “Test Method B—Manual Cadmium Reduction”, approved January 10, 1990, referenced in Section 611.611.~~

~~ASTM Method D3972-97, “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 1997, referenced in Section 611.720.~~

~~ASTM Method D3972-02, “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 2002, referenced in Section 611.720.~~

~~ASTM Method D3972-09, “Standard Test Method for Isotopic Uranium in Water by Radiochemistry”, approved 2009, referenced in Section 611.720.~~

~~ASTM Method D4107-91, “Standard Test Method for Tritium in Drinking Water”, approved 1991, referenced in Section 611.720.~~

~~ASTM Method D4107-98, “Standard Test Method for Tritium in Drinking Water”, approved 1998, referenced in Section 611.720.~~

~~ASTM Method D4107-08, “Standard Test Method for Tritium in Drinking Water”, approved 2008, referenced in Section 611.720.~~

~~ASTM Method D4327-97, “Standard Test Method for Anions in Water by Ion Chromatography”, approved 1997, referenced in Section 611.611.~~

~~ASTM Method D4327-03, “Standard Test Method for Anions in Water by Ion Chromatography”, approved 2003, referenced in Section 611.611.~~

~~ASTM Method D4327-11, “Standard Test Method for Anions in Water by Ion Chromatography”, approved 2011, referenced in Section 611.611.~~

~~ASTM Method D4785-93, “Standard Test Method for Low-Level Iodine-131 in Water”, approved 1993, referenced in Section 611.720.~~

~~ASTM Method D4785-00a, “Standard Test Method for Low-Level Iodine-131 in Water”, approved 2000, referenced in Section 611.720.~~

~~ASTM Method D4785-08, “Standard Test Method for Low-Level Iodine-131 in Water”, approved 2008, referenced in Section~~

~~611.720.~~

~~ASTM Method D5174-97, "Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry", approved 1997, referenced in Section 611.720.~~

~~ASTM Method D5174-02, "Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry", approved 2002, referenced in Section 611.720.~~

~~ASTM Method D5174-07, "Standard Test Method for Trace Uranium in Water by Pulsed-Laser Phosphorimetry", approved 2007, referenced in Section 611.720.~~

~~ASTM Method D5317-93, "Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector", approved 1993, referenced in Section 611.645.~~

~~ASTM Method D5317-98(2003) "Standard Test Method for Determination of Chlorinated Organic Acid Compounds in Water by Gas Chromatography with an Electron Capture Detector", approved 1998 (reapproved 2003), referenced in Section 611.645.~~

~~ASTM Method D5673-03, "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2003, referenced in Section 611.720.~~

~~ASTM Method D5673-05, "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2005, referenced in Section 611.720.~~

~~ASTM Method D5673-10, "Standard Test Method for Elements in Water by Inductively Coupled Plasma-Mass Spectrometry", approved 2010, referenced in Section 611.720.~~

~~ASTM Method D6239-09, "Standard Test Method for Uranium in Drinking Water by High-Resolution Alpha-Liquid-Scintillation Spectrometry", approved 2009, referenced in Section 611.720.~~

~~ASTM Method D6508-00(2005) "Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte", approved 2000 (revised 2005), referenced in Section 611.611.~~

~~ASTM Method D6508-15, "Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte",~~

~~approved 2015, referenced in Section 611.611.~~

~~ASTM Method D6581-00, "Standard Test Method for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Chemically Suppressed Ion Chromatography", approved 2000, referenced in Section 611.381.~~

~~ASTM Method D6581-08 A and B, "Standard Test Method for Bromate, Bromide, Chlorate, and Chlorite in Drinking Water by Suppressed Ion Chromatography", "Test Method A – Chemically Suppressed Ion Chromatography" and "Test Method B – Electrolytically Suppressed Ion Chromatography", approved 2008, referenced in Section 611.381.~~

~~ASTM Method D6888-04, "Standard Test Method for Available Cyanide with Ligand Displacement and Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection", approved 2004, referenced in Section 611.611.~~

~~ASTM Method D6919-03, "Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography", approved 2003, referenced in Section 611.611.~~

~~ASTM Method D6919-09, "Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography", approved 2009, referenced in Section 611.611.~~

~~ASTM Method D7283-17, "Standard Test Method for Alpha and Beta Activity in Water by Liquid Scintillation Counting", approved 2017, referenced in Section 611.720.~~

~~BOARD NOTE: The most recent version of ASTM methods are available for paid download from the ASTM at www.astm.org. Note that the most recent version of an ASTM method may not be the version approved for use by USEPA and incorporated by reference in this subsection (b).~~

~~Bran + Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.~~

~~Technicon Methods, Method #129-71W, "Fluoride in Water and Wastewater", Industrial Method #129-71W, December 1972. See 40 CFR 141.23(k)(1), footnote 11, referenced in Section 611.611.~~

~~Technicon Methods, Method #380-75WE, "Fluoride in Water and Wastewater", #380-75WE, February 1976. See 40 CFR 141.23(k)(1), footnote 11, referenced in Section 611.611.~~

~~Charm Sciences, Inc., 659 Andover St., Lawrence, MA 01843-1032:~~

~~E*Colite Test, "Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water", January 9, 1998 (referred to as "E*Colite Test"), referenced in Sections 611.802 and 611.1052 (also available from USEPA, Water Resource Center).~~

~~"Charm Fast Phage Test. Presence/Absence for Coliphage in Ground Water with Same Day Positive Prediction", version 009 (Nov. 2012), referenced in Section 611.802.~~

~~CPI International, Inc., 5580 Skylane Blvd., Santa Rosa, CA 95403 (800-878-7654/fax: 707-545-7901/Internet address: www.cpiinternational.com).~~

~~Modified Colitag™ Test, "Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in Water (ATP D05-0035)", August 2009, referenced in Sections 611.802 and 611.1052. See also NEMI.~~

~~EMD Millipore (division of Merck KGgA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821 (800-645-5476 or 781-533-6000).~~

~~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, referenced in Sections 611.802 and 611.1052.~~

~~Readycult® 2007, "Readycult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters", Version 1.1, January 2007, referenced in Sections 611.802 and 611.1052.~~

~~Georgia Tech Research Institute, Robert Rosson, 925 Dalney Road, Atlanta, GA 30332 (404-407-6339).~~

~~Georgia Radium Method, "The Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-ray Spectrometry Using HPGE or Ge(Li) Detectors", rev. 1.2, December 2004, referenced in Section 611.720.~~

~~Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, WI 53223.~~

~~GLI Method 2, "Turbidity", Nov. 2, 1992, referenced in Section 611.531.~~

~~H&E Testing Laboratory, 221 State Street, Augusta, ME 04333 (207-287-2727).~~

> ~~Method ME355.01, rev. 1, "Determination of Cyanide in Drinking Water by GC/MS Headspace Analysis", May 2009, referenced in Section 611.611. See also NEMI.~~

~~The Hach Company, P.O. Box 389, Loveland, CO 80539-0389 (800-227-4224/Internet address: www.hach.com).~~

> ~~Hach FilterTrak Method 10133, "Determination of Turbidity by Laser Nephelometry", January 2000, rev. 2.0, referenced in Section 611.531.~~
>
> ~~Hach Method 8026, "Spectrophotometric Measurement of Copper in Finished Drinking Water", December 2015, rev. 1.2, referenced in Section 611.611.~~
>
> ~~Hach Method 10241, "Spectrophotometric Measurement of Free Chlorine (Cl2) in Finished Drinking Water", November 2015, rev. 1.2 (referred to as "Hach Method 10241"), referenced in Sections 611.381 and 611.531.~~
>
> ~~Hach Method 10258, "Determination of Turbidity by 360° Nephelometry", January 2016, rev. 1.0, referenced in Section 611.531.~~
>
> ~~Hach Method 10260", Determination of Chlorinated Oxidants (Free and Total) in Water Using Disposable Planar Reagent-filled Cuvettes and Mesofluic Channel Colorimetry", April 2013, referenced in Sections 611.381 and 611.531.~~
>
> ~~Hach Method 10261, "Total Organic Carbon in Finished Drinking Water by Catalyzed Ozone Hydroxyl Radical Oxidation Infrared Analysis", December 2015, rev. 1.2, referenced in Section 611.381.~~
>
> ~~Hach Method 10267, "Spectrophotometric Measurement of Total Organic Carbon (TOC) in Finished Drinking Water", December 2015, rev. 1.2, referenced in Section 611.381.~~
>
> ~~Hach Method 10272, "Spectrophotometric Measurement of Copper in Finished Drinking Water", December 2015, rev. 1.2, referenced in Section 611.611.~~
>
> ~~Hach SPADNS 2 Method 10225, "Fluoride, USEPA SPADNS 2 Method 10225", rev. 2.0, January 2011, referenced in Section 611.611.~~

~~Hach TNTplus 835/836 Method 10206, "Hach Company TNTplus 835/836 Nitrate Method 10206 – Spectrophotometric Measurement of Nitrate in Water and Wastewater", rev. 2.0, January 2011, referenced in Section 611.611.~~

~~m-ColiBlue24 Test, "Total Coliforms and E. coli Membrane Filtration Method with m-ColiBlue24® Broth", Method No. 10029, rev. 2, August 17, 1999, referenced in Sections 611.802 and 611.1052 (also available from USEPA, Water Resource Center).~~

~~Palintest Method 1001, "Method 1001: Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry", August 1999, referenced in Section 611.611.~~

~~IAEA. International Atomic Energy Agency, Vienna International Centre, PO Box 100, 1400 Vienna, Austria, telephone: (+43-1) 2600-0.~~

~~NBS Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure" August 1963, referenced in Sections 611.101 and 611.330. Also available from NTIS and ORAU. Internet link for document: http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/37/048/37048205.pdf.~~

~~BOARD NOTE: The 1963 version of National Bureau of Standards Handbook 69 modifies the 1959 publication of the National Committee on Radiation Protection, NCRP Report No. 22, of the same title. The version available on the NCRP website is the 1959 document.~~

~~IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, Maine 04092 (800-321-0207).~~

~~SimPlate Method, "IDEXX SimPlate TM HPC Test Method for Heterotrophs in Water", November 2000, referenced in Section 611.531.~~

~~Industrial Test Systems, Inc., 1875 Langston St., Rock Hill, SC 29730 (803-329-2999).~~

~~ITS Method D99-003, rev. 3.0, "Free Chlorine Species (HOCl$^-$ and OCl$^-$) by Test Strip", November 21, 2003, referenced in Section 611.381.~~

~~Lachat Instruments, 6645 W. Mill Rd., Milwaukee, WI 53218 (414-358-4200).~~

~~QuikChem Method 10-204-00-1-X, "Digestion and distillation of~~

~~total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis", rev. 2.1, November 30, 2000, referenced in Section 611.611.~~

~~Leck Mitchell, PhD, PE, 656 Independence Valley Dr., Grand Junction, CO 81507 (920-244-8661). See also NEMI.~~

~~Mitchell Method M5271, rev. 1.1, "Determination of Turbidity by Laser Nephelometry", March 2009, referenced in Section 611.531.~~

~~Mitchell Method M5331, rev. 1.1, "Determination of Turbidity by LED Nephelometry", March 2009, referenced in Section 611.531.~~

~~Mitchell Method M5331, rev. 1.2, "Determination of Turbidity by LED or Laser Nephelometry", February 2016, referenced in Section 611.531.~~

~~NEMI. National Environmental Method Index (on-line at www.nemi.gov/home/).~~

~~AMI Turbiwell Method, "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter", August 2009, referenced in Section 611.531. See also SWAN Analytische Instrumente AG.~~

~~Dioxin and Furan Method 1613, rev. B, "Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS", October 1994, EPA 821/B-94/005, referenced in Section 611.645. See also NTIS and USEPA, NSCEP.~~

~~Method ME355.01, rev. 1, "Determination of Cyanide in Drinking Water by GC/MS Headspace Analysis", May 2009, referenced in Section 611.611. See also H&E Testing Laboratory.~~

~~Mitchell Method M5271, rev. 1.1, "Determination of Turbidity by Laser Nephelometry", March 2009, referenced in Section 611.531. See also Leck Mitchell, PhD, PE.~~

~~Mitchell Method M5331, rev. 1.1, "Determination of Turbidity by LED Nephelometry", March 2009, referenced in Section 611.531. See also Leck Mitchell, PhD, PE.~~

~~Mitchell Method M5331, rev. 1.2, "Determination of Turbidity by LED or Laser Nephelometry", February 2016, referenced in Section 611.531. See also Leck Mitchell, PhD, PE.~~

~~Modified Colitag™ Test, "Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in~~

~~Water (ATP D05-0035)", August 2009, referenced in Section 611.802. See also CPI International, Inc.~~

~~Orion Method AQ4500, "Determination of Turbidity by LED Nephelometry", May 2009, referenced in Section 611.531. See also Thermo Scientific.~~

~~Palintest ChloroSense, "Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense", September 2009, referenced in Sections 611.381 and 611.531. See also Palintest.~~

~~Systea Easy (1-Reagent), "Systea Easy (1-Reagent) Nitrate Method", February 2009, referenced in Section 611.611. See also Systea Scientific, LLC.~~

~~USEPA Asbestos Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water", September 1983, EPA 600/4-83-043, referenced in Section 611.611. See also NTIS and USEPA, NSCEP.~~

~~USEPA Asbestos Method 100.2, "Determination of Asbestos Structures over 10-mm in Length in Drinking Water", June 1994, EPA 600/R-94-134, referenced in Section 611.611. See also NTIS and USEPA, NSCEP.~~

~~USEPA Environmental Inorganic Methods, "Methods for the Determination of Inorganic Substances in Environmental Samples", August 1993, EPA 600/R-93-100, referenced in Sections 611.381, 611.531 and 611.611. (Methods 180.1 (rev. 2.0), 300.0 (rev. 2.1), 335.4 (rev. 1.0), 353.2 (rev. 2.0), and 365.1 (rev. 2.0) only.) (Individual methods available by method number.) See also NTIS and USEPA, NSCEP.~~

~~USEPA Environmental Metals Methods, "Methods for the Determination of Metals in Environmental Samples – Supplement I", May 1994, EPA 600/R-94-111, referenced in Sections 611.600, 611.611, 611.612, and 611.720. (Methods 200.7 (rev. 4.4), 200.8 (rev. 5.3), 200.9 (rev. 2.2), and 245.1 (rev. 3.0) only.) (Individual methods available by method number.) See also NTIS and USEPA, NSCEP.~~

~~USEPA Inorganic Methods, "Methods for Chemical Analysis of Water and Wastes", March 1983, EPA 600/4-79-020, referenced in Section 611.611. (Methods 150.1, 150.2, and 245.2 only.) (Individual methods available by method number.) See also NTIS and USEPA, NSCEP.~~

~~USEPA Method 1600, "Method 1600: Enterococci in Water by~~

~~Membrane Filtration Using Membrane-Enterococcus Indoxyl-b-D-Glucoside Agar (mEI)", September 2002, EPA 821/R-02/022 is an approved variation of Standard Methods, Method 9230 C, "Fecal Streptococcus and Enterococcus Groups, Membrane Filter Techniques" (which has not itself been approved for use by USEPA) (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1600sp02.pdf), referenced in Section 611.802. See also USEPA, NSCEP and USEPA, Water Resource Center.~~

~~USEPA Method 1601, "Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure", April 2001, EPA 821/R-01/030 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1601ap01.pdf), referenced in Section 611.802. See also USEPA, NSCEP and USEPA, Water Resource Center.~~

~~USEPA Method 1602, "Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure", April 2001, EPA 821/R-01/029 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1602ap01.pdf), referenced in Section 611.802. See also USEPA, NSCEP and USEPA, Water Resource Center.~~

~~USEPA Method 1604, "Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium)", September 2002, EPA 821/R-02/024 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1604sp02.pdf), referenced in Sections 611.802 and 611.1052. See also USEPA, NSCEP and USEPA, Water Resource Center.~~

~~USEPA NERL Method 200.5, rev. 4.2, "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry", October 2003, EPA 600/R-06/115, referenced in Sections 611.611 and 611.612. See also USEPA, ORD and USEPA, NSCEP.~~

~~USEPA NERL Method 415.3, rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", September 2009, EPA 600/R-09/122, referenced in Section 611.381. See also USEPA, ORD and USEPA, NSCEP.~~

~~USEPA NERL Method 549.2, rev. 1.0, "Determination of Diquat and Paraquat in Drinking Water by Liquid-Solid Extraction and~~

~~High Performance Liquid Chromatography with Ultraviolet Detection", June 1997, referenced in Section 611.645. See also USEPA, ORD.~~

~~USEPA OGWDW Methods, Method 302.0, "Determination of Bromate in Drinking Water Using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection", September 2009, EPA 815/B-09/014, referenced in Sections 611.381 and 611.382. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 317.0, rev. 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis", July 2001, EPA 815/B-01/001, referenced in Sections 611.381 and 611.382. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 326.0, rev. 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis", June 2002, EPA 815/R-03/007, referenced in Sections 611.381 and 611.382. See also NTIS; USEPA, OGWDW; and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 327.0, rev. 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry", May 2005, EPA 815/R-05/008, referenced in Sections 611.381 and 611.531. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 334.0, "Determination of Residual in Drinking Water Using an On-line Chlorine Analyzer", August 2009, EPA 815/B-09/013, referenced in Sections 611.381 and 611.531. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 515.4, rev. 1.0, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection", April 2000, EPA 815/B-00/001 (document file name "met515_4.pdf"), referenced in Section 611.645. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 524.3, rev. 1.0,~~

~~"Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry", June 2009, EPA 815/B-09/009, referenced in Sections 611.381 and 611.645. See also USEPA, OGWDW; and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 531.2, rev. 1.0, "Measurement of N-methylcarbamoyloximes and N-methylcarbamates in Water by Direct Aqueous Injection HPLC with Postcolumn Derivatization", September 2001, EPA 815/B-01/002 (document file name "met531_2.pdf"), referenced in Section 611.645. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 552.3, rev. 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection", July 2003, EPA 815/B-03/002, referenced in Sections 611.381 and 611.645. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 557, "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry", September 2009, EPA 815/B-09/012, referenced in Sections 611.381, 611.382, and 611.645. (Search for "815B09012".) See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1622 (01), "Cryptosporidium in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/026, referenced in Section 611.1007. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1623 (01), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/025, referenced in Section 611.1007. See also USEPA, OGWDW and USEPA, NSCEP.~~

~~USEPA Organic and Inorganic Methods, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1", August 2000, EPA 815/R-00/014, referenced in Sections 611.381, 611.382, 611.611, and 611.645 (Methods 300.1 (rev. 1.0), 321.8 (rev. 1.0), and 515.3 (rev. 1.0) only). (Individual methods available by method number.) See also NEMI, NTIS, and USEPA, NSCEP.~~

~~USEPA Organic Methods, "Methods for the Determination of Organic Compounds in Drinking Water", December 1988, revised~~

~~July 1991, EPA 600/4-88/039, referenced in Sections 611.645 and 611.648 (Methods 508A (rev. 1.0) and 515.1 (rev. 4.0) only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement I", July 1990, EPA 600/4-90/020, referenced in Sections 611.645 and 611.648 (Methods 547, 550, and 550.1 only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement II", August 1992, EPA 600/R-92/129, referenced in Sections 611.381 and 611.645 (Methods 548.1 (rev. 1.0), 552.1 (rev. 1.0), and 555 (rev. 1.0) only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement III", August 1995, EPA 600/R-95/131, referenced in Sections 611.381, 611.645, and 611.648 (Methods 502.2 (rev. 2.1), 504.1 (rev. 1.1), 505 (rev. 2.1), 506 (rev. 1.1), 507 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 515.2 (rev. 1.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 531.1 (rev. 3.1), 551.1 (rev. 1.0), and 552.2 (rev. 1.0) only). (Individual methods available by method number.) See also NTIS; USEPA, EMSL; and USEPA, NSCEP.~~

~~USEPA Radioactivity Methods, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", August 1980, EPA 600/4-80/032, referenced in Section 611.720. (Methods 900.0, 901.1, 903.0, 903.1, and 908.0 only.) (Individual methods available by method number.) See also NTIS and USEPA, NSCEP.~~

~~USEPA Radiochemistry Procedures, "Radiochemistry Procedures Manual", EPA 520/5-84/006, August 1984, Doc. No. PB84-215581, referenced in Section 611.720. (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04 only.) (Individual Methods Ra-04 and Sr-04 available by method number.) See also NTIS and USEPA, NSCEP.~~

~~NSF. National Sanitation Foundation International, 3475 Plymouth Road, PO Box 130140, Ann Arbor, Michigan 48113-0140 (734-769-8010).~~

~~NSF Standard 61, section 9, November 1998, referenced in Sections 611.126 and 611.356.~~

~~NTIS. National Technical Information Service, U.S. Department of Commerce, 5301 Shawnee Road, Alexandria, VA 22312 (703-605-6000 or 800-553-6847, www.ntis.gov).~~

~~Aqueous Radiochemical Procedures, "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", H.L. Krieger and S. Gold, EPA-R4-73-014, May 1973, Doc. No. PB222-154/7BA, referenced in Section 611.720. See also USEPA,~~

~~EMSL and USEPA, NSCEP.~~

~~Dioxin and Furan Method 1613, rev. B, "Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS", October 1994, rev. B, EPA 821/B-94/005, Doc. No. 94-104774, referenced in Section 611.645. See also USEPA, NSCEP.~~

~~Kelada 01, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate", rev. 1.2, August 2001, EPA 821/B-01-009, referenced in Section 611.611.~~

~~NBS Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", as amended August 1963, U.S. Department of Commerce, referenced in Sections 611.101 and 611.330.~~

~~USEPA Asbestos Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water", EPA 600/4-83-043, September 1983, Doc. No. PB83-260471, referenced in Section 611.611. See also NEMI and USEPA, NSCEP.~~

~~USEPA Asbestos Method 100.2, "Determination of Asbestos Structures over 10-mm in Length in Drinking Water", EPA 600/R-94-134, June 1994, Doc. No. PB94-201902, referenced in Section 611.611. See also NEMI and USEPA, NSCEP.~~

~~USEPA Environmental Inorganic Methods, "Methods for the Determination of Inorganic Substances in Environmental Samples", August 1993, EPA 600/R-93-100, Doc. No. PB94-121811, referenced in Sections 611.381, 611.531, and 611.611. (Methods 180.1 (rev. 2.0), 300.0 (rev. 2.1), 335.4 (rev. 1.0), 353.2 (rev. 2.0), and 365.1 (rev. 2.0) only.) See also NEMI and USEPA, NSCEP.~~

~~USEPA Environmental Metals Methods, "Methods for the Determination of Metals in Environmental Samples – Supplement I", May 1994, EPA 600/R-94-111, Doc. No. PB95-125472, referenced in Sections 611.600, 611.611, 611.612, and 611.720. (Methods NTIS (rev. 4.4), 200.8 (rev. 5.3), 200.9 (rev. 2.2), and 245.1 (rev. 3.0) only.) See also NEMI and USEPA, NSCEP.~~

~~USEPA Inorganic Methods, "Methods for Chemical Analysis of Water and Wastes", March 1983, EPA 600/4-79-020, Doc. No. PB84-128677, referenced in Section 611.611. (Methods 150.1, 150.2, and 245.2 only.) See also NEMI and USEPA, NSCEP.~~

~~USEPA Interim Radiochemical Methods, "Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75-008 (revised), Doc. No. PB253258, March 1976, referenced in Section 611.720 (pages 1-3, 4-5, 6-8, 9-12, 13-15, 16-23, 24-28, 29-33, and 34-37 only). See also USEPA, EMSL and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 326.0, rev. 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis", June 2002, EPA 815/R-03/007, Doc. No. PB2003-107402, referenced in Sections 611.381 and 611.382. See also NEMI; USEPA, NSCEP; and USEPA, OGWDW.~~

~~USEPA Organic and Inorganic Methods, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1", August 2000, EPA 815/R-00/014, Doc. No. PB2000-106981, referenced in Sections 611.381, 611.362, 611.611, and 611.645. (Methods 300.1 (rev. 1.0), 321.8 (rev. 1.0), and 515.3 (rev. 1.0).) See also NEMI and USEPA, NSCEP.~~

~~USEPA Organic Methods, "Methods for the Determination of Organic Compounds in Drinking Water", December 1988 (revised July 1991), EPA 600/4-88/039, Doc. No. PB91-231480, referenced in Sections 611.645 and 611.648 (Methods 508A (rev. 1.0) and 515.1 (rev. 4.0) only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement I", July 1990, EPA 600/4-90/020, Doc. No. PB91-146027, referenced in Section 611.645 (Methods 547, 550, and 550.1 only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement II", August 1992, EPA 600/R-92/129, Doc. No. PB92-207703, referenced in Sections 611.381 and 611.645. (Methods 548.1 (rev. 1.0), 552.1 (rev. 1.0), and 555 (rev. 1.0) only); and "Methods for the Determination of Organic Compounds in Drinking Water – Supplement III", August 1995, EPA 600/R-95/131, Doc. No. PB95-261616, referenced in Sections 611.381 and 611.645 (Methods 502.2 (rev. 2.1), 504.1 (rev. 1.1), 505 (rev. 2.1), 506 (rev. 1.1), 507 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 515.2 (rev. 1.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 531.1 (rev. 3.1), 551.1 (rev. 1.0), and 552.2 (rev. 1.0) only.) See also NEMI; USEPA, EMSL; and USEPA, NSCEP.~~

~~USEPA Radioactivity Methods, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", EPA 600/4-80/032, August 1980, Doc. No. PB80-224744, referenced in Section 611.720. (Methods 900.0, 901.0, 901.1, 902.0, 903.0, 903.1, 904.0, 905.0, 906.0, 908.0, 908.1 only.) See also NEMI and~~

~~USEPA, NSCEP.~~

~~USEPA Radiochemical Analyses, "Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979, Doc. No. EMSL LV 053917, referenced in Section 611.720. (Pages 1-5, 19-32, 33-48, 65-73, 87-91, and 92-95 only.) Also available from USEPA, NSCEP.~~

~~USEPA Radiochemistry Procedures, "Radiochemistry Procedures Manual", EPA 520/5-84-006, August 1984, Doc. No. PB84-215581, referenced in Section 611.720. (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04 only.) See also NEMI and USEPA, NSCEP.~~

~~USEPA Technical Notes, "Technical Notes on Drinking Water Methods", EPA 600/R-94/173, October 1994, Doc. No. PB95-104766, referenced in Sections 611.531, 611.611, and 611.645. See also USEPA, NSCEP.~~

~~BOARD NOTE: USEPA made the following assertion with regard to this reference at 40 CFR 141.23(k)(1) and 141.24(e) and (n)(11): "This document contains other analytical test procedures and approved analytical methods that remain available for compliance monitoring until July 1, 1996." Also available online at http://nepis.epa.gov/EPA/html/Pubs/pubtitleORD.htm under the document designation "600R94173".~~

~~New Jersey Department of Environment, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.~~

~~New Jersey Radium Method, "Determination of Radium 228 in Drinking Water", August 1990, referenced in Section 611.720.~~

~~New York Department of Health, Radiological Sciences Institute, Center for Laboratories and Research, Empire State Plaza, Albany, NY 12201.~~

~~New York Radium Method, "Determination of Ra-226 and Ra-228 (Ra-02)", January 1980, Revised June 1982, referenced in Section 611.720.~~

~~ORAU. Oak Ridge Associated Universities, MC100-44, PO Box 117, Oak Ridge, TN 37831-0117, telephone: 865-576-3146.~~

~~NBS Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure", August 1963, referenced in Sections 611.101 and 611.330. Internet link for document:~~

~~www.orau.org/ptp/Library/NBS/NBS%2069.pdf. Also available from IAEA and NTIS.~~
~~BOARD NOTE: The 1963 version of National Bureau of Standards Handbook 69 modifies the 1959 publication of the National Committee on Radiation Protection, NCRP Report No. 22, of the same title. The version available on the NCRP website is the 1959 document.~~

~~Palintest, Ltd., 1455 Jamike Avenue, Suite 100, Erlanger, KY (800-835-9629).~~

~~ChlordioX Plus Test, "Chlorine Dioxide and Chlorite in Drinking Water by Amperometry using Disposable Sensors", November 2013, referenced in Sections 611.381 and 611.531.~~

~~Palintest Method 1001, "Method 1001: Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry", August 1999, referenced in Section 611.611.~~

~~Palintest ChloroSense, "Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense", September 2009, referenced in Sections 611.381 and 611.531. See also NEMI.~~

~~Pathogen Detection Systems, Inc., 382 King Street, Kingston, Ontario, Canada K7K 2Y2 (844-215-7122 or www.tecta-pds.ca).~~

~~Tecta EC/TC P-A Test, ver. 1.0, "TECTA™ EC/TC medium and the TECTA™ Instrument: a Presence/Absence Method for Simultaneous Detection of Total Coliforms and Escherichia coli (E.coli) in Drinking Water", ver. 1.0, May 2014, referenced in Sections 611.802 and 611.1052.~~

~~Tecta EC/TC P-A Test, ver. 2.0, "TECTA™ EC/TC medium and the TECTA™ Instrument: a Presence/Absence Method for Simultaneous Detection of Total Coliforms and Escherichia coli (E.coli) in Drinking Water", ver. 2.0, February 2017, referenced in Sections 611.802 and 611.1052.~~

~~Standard Methods Online, available online from the Standard Methods Organization at www.standardmethods.org.~~

~~Method 3113 B-04, Metals by Electrothermal Atomic Absorption Spectrometry, Electrothermal Atomic Absorption Spectrometric Method, referenced in Sections 611.611 and 611.612.~~

~~Method 7110 D-17, Liquid Scintillation Spectroscopic Method for Gross Alpha-Beta, referenced in Section 611.802.~~

~~Method 9230 B-04, Fecal Streptococcus and Enterococcus Groups, Multiple Tube Techniques, referenced in Section 611.802.~~

~~BOARD NOTE: Where, in appendix A to subpart C of 40 CFR 141, USEPA has authorized use of an approved alternative method from Standard Methods Online, and that version of the method appears also in Standard Methods, 21st or 22nd ed., the Board cites only to Standard Methods, 21st or 22nd ed. for that method. The methods that USEPA listed as available from Standard Methods Online, and which are listed above as in Standard Methods, 21st or 22nd edition, are the following: 2320 B-97 (for alkalinity), 3112 B-09 (for mercury), 3114 B-09 (for arsenic and selenium), 4500-P E-99 and 4500-P F-99; (for orthophosphate); 4500-SO_4^{-2} C-97, 4500-SO_4^{-2} D-97, 4500-SO_4^{-2} E-97, and 4500-SO_4^{-2} F-97 (for sulfate); 6640 B-01 (for 2,4-D, 2,4,5-TP (silvex), dalapon, dinoseb, pentachlorophenol, and picloram); 5561 B-00 (for glyphosate); 7500-Ra E-07 (for radium-226 and -228); and 9223 B-97 (for E. coli). Since each method is the same version from both sources, the Board views a copy from Standard Methods Online as equivalent to a copy from Standard Methods Online, even though the Board does not also cite to Standard Methods Online. The Board intends that use of the version of the method that is incorporated by reference is acceptable from either source.~~

~~SWAN Analytische Instrumente AG, Studbachstrasse 13, CH-8340, Hinwil, Switzerland.~~

~~AMI Turbiwell Method, "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter", August 2009, referenced in Section 611.531. See also NEMI.~~

~~Superior Enzymes Inc., 334 Hecla Street, Lake Linden, Michigan 49945 (906-296-1115).~~

~~NECi Nitrate Reductase Method, "Method for Nitrate Reductase Nitrate-Nitrogen Analysis of Drinking Water", ver. 1.0, rev. 2.0, February 2016, referenced in Section 611.611.~~

~~Syngenta Crop Protection, Inc., 410 Swing Road, Post Office Box 18300, Greensboro, NC 27419 (336-632-6000).~~

~~Syngenta AG-625, "Atrazine in Drinking Water by Immunoassay", February 2001, referenced in Section 611.645.~~

~~Systea Scientific LLC, 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523 (630-645-0600).~~

~~Systea Easy (1-Reagent), "Systea Easy (1-Reagent) Nitrate Method", February 2009, referenced in Section 611.611. See also~~

~~NEMI.~~

~~Thermo-Fisher Scientific, 490 Lakewside Dr, Sunnyvale, CA 94085 (800-556-2323 or www.thermofisher.com).~~

~~Thermo-Fisher Method 557.1, "Determination of Haloacetic Acids in Drinking Water using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection", January 2017, ver. 1.0, referenced in Section 611.611.~~

~~Thermo-Fisher Scientific, 168 Third Ave, Waltham, MA 02451 (800-556-2323 or www.thermofisher.com).~~

~~Orion Method AQ4500, "Determination of Turbidity by LED Nephelometry", May 2009, referenced in Section 611.531. See also NEMI.~~

~~Technical Bulletin 601, "Standard Method of Testing for Nitrate in Drinking Water", July, 1994, PN 221890-001, referenced in Section 611.611.~~

~~Thermo-Fisher Scientific, Ratastie 2, 01620 Vantaa, Finland.~~

~~Thermo-Fisher Discrete Analyzer, "Thermo Fisher Scientific Drinking Water Orthophosphate Method for Thermo Scientific Gallery Discrete Analyzer," February 2016, rev. 5, referenced in Section 611.611.~~

~~Tintometer, Inc., 6456 Parkland Drive, Sarasota, FL 34243 (800-922-5242, 941-758-6410, or www.lovibond.us).~~

~~Lovibond PTV 1000, "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 1000 White Light LED Turbidimeter," December 2016. rev. 1.0, referenced in Section 611.531.~~

~~Lovibond PTV 2000, "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 2000 660-nm LED Turbidimeter," December 2016. rev. 1.0, referenced in Section 611.531.~~

~~Lovibond PTV 6000, "Continuous Measurement of Drinking Water Turbidity Using a Lovibond PTV 6000 Laser Turbidimeter," December 2016. rev. 1.0, referenced in Section 611.531.~~

~~USDHS, STD. United States Department of Homeland Security, Science and Technology Directorate (formerly United States Department of~~

~~Energy, Environmental Measurements Laboratory), currently available on-line in the 28th edition only, at www.hsdl.org/?abstract&doc=100185&coll=limited. See also USDOE, EML.~~

> ~~EML Procedures Manual (28th ed.), "EML Procedures Manual", HASL 300, 28th ed., 1997 (Methods Ga-01-R, Ra-04, Sr-01, Sr-02, U-02, and U-04 only), referenced in Section 611.720.~~

~~USDOE, EML. United States Department of Energy, Environmental Measurements Laboratory (United States Department of Homeland Security, Science and Technology Directorate, since 2003), currently available on-line in the 28th edition only, at www.wipp.energy.gov/namp/emllegacy/procman.htm. See also USDHS, STD.~~

> ~~EML Procedures Manual (27th ed.), "EML Procedures Manual", HASL 300, 27th Edition, Volume 1, 1990 (Methods Ga-01-R, Ra-04, Sr-01, Sr-02, U-02, and U-04 only), referenced in Section 611.720.~~
>
> ~~EML Procedures Manual (28th ed.), "EML Procedures Manual", HASL 300, 28th ed., 1997 (Methods Ga-01-R, Ra-04, Sr-01, Sr-02, U-02, and U-04 only), referenced in Section 611.720.~~

~~BOARD NOTE: Although only the 28th edition is currently available, USEPA has approved use of the methods from the 27th edition also. The Board has retained the reference to the 27th edition for the benefit of any laboratory that may be using that edition.~~

~~USEPA, EMSL. United States Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 (513-569-7586).~~

> ~~Aqueous Radiochemical Procedures, "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", EPA-R4-73-014, May 1973, referenced in Section 611.720. See also NTIS and USEPA, NSCEP.~~
>
> ~~USEPA Interim Radiochemical Methods, "Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75/008 (revised), March 1976, referenced in Section 611.720 (pages 1-3, 4-5, 6-8, 9-12, 13-15, 16-23, 24-28, 29-33, and 34-37 only). See also NTIS and USEPA, NSCEP.~~
>
> ~~USEPA Organic Methods, "Methods for the Determination of Organic Compounds in Drinking Water", December 1988 (revised July 1991), EPA 600/4-88/039, referenced in Sections 611.645 and 611.648 (Methods 508A (rev. 1.0) and 515.1 (rev. 4.0) only);~~

~~"Methods for the Determination of Organic Compounds in Drinking Water – Supplement I", July 1990, EPA 600/4-90/020, referenced in Section 611.645 (Methods 547, 550, and 550.1 only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement II", August 1992, EPA 600/R-92/129, referenced in Sections 611.381 and 611.645 (Methods 548.1 (rev. 1.0), 552.1 (rev. 1.0), and 555 (rev. 1.0) only); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement III", August 1995, EPA 600/R-95/131, referenced in Sections 611.381 and 611.645 (Methods 502.2 (rev. 2.1), 504.1 (rev. 1.1), 505 (rev. 2.1), 506 (rev. 1.1), 507 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 515.2 (rev. 1.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 531.1 (rev. 3.1), 551.1 (rev. 1.0), and 552.2 (rev. 1.0) only). See also NEMI; NTIS; and USEPA, NSCEP.~~

~~USEPA, NSCEP. United States Environmental Protection Agency, National Service Center for Environmental Publications, P.O. Box 42419, Cincinnati, OH 45242-0419 (except for OGWDW Method 1622 (99), accessible on-line and available by download from http://www.epa.gov/nscep/ using the search term indicated for the individual method).~~

~~Aqueous Radiochemical Procedures, "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", EPA-R4-73-014, May 1973, referenced in Section 611.720. (Search for "R473014".) See also NTIS and USEPA, EMSL.~~

~~Dioxin and Furan Method 1613, rev. B, "Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS", October 1994, EPA 821/B-94/005, referenced in Section 611.645. (Search for "821B94005".) See also NEMI and NTIS.~~

~~Guidance Manual for Filtration and Disinfection, "Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources", March 1991, EPA 570/3-91-001, referenced in Sections 611.111 and 611.212. (Search for "570391001".)~~

~~USEPA Asbestos Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water", September 1983, EPA 600/4-83-043, referenced in Section 611.611. (Search for "600483043".) See also NEMI and NTIS.~~

~~USEPA Asbestos Method 100.2, "Determination of Asbestos Structures over 10-mm in Length in Drinking Water", June 1994, EPA 600/R-94-134, referenced in Section 611.611. (Search for~~

~~"600R94134".) See also NEMI and NTIS.~~

~~USEPA Environmental Inorganic Methods, "Methods for the Determination of Inorganic Substances in Environmental Samples", August 1993, EPA 600/R-93-100, referenced in Sections 611.381, 611.531, and 611.611. (Methods 180.1 (rev. 2.0), 300.0 (rev. 2.1), 335.4 (rev. 1.0), 353.2 (rev. 2.0), and 365.1 (rev. 2.0) only.) (Search for "600R93100".) See also NEMI and NTIS.~~

~~USEPA Environmental Metals Methods, "Methods for the Determination of Metals in Environmental Samples – Supplement I", May 1994, EPA 600/R-94-111, referenced in Sections 611.600, 611.611, 611.612, and 611.720. (Methods 200.7 (rev. 4.4), 200.8 (rev. 5.3), 200.9 (rev. 2.2), and 245.1 (rev. 3.0) only.) (Search for "600R94111".) See also NEMI and NTIS.~~

~~USEPA Inorganic Methods, "Methods for Chemical Analysis of Water and Wastes", March 1983, EPA 600/4-79-020, referenced in Section 611.611. (Methods 150.1, 150.2, and 245.2 only.) (Search for "600479020".) See also NEMI and NTIS.~~

~~USEPA Interim Radiochemical Methods, "Interim Radiochemical Methodology for Drinking Water", EPA 600/4-75/008 (revised), March 1976, referenced in Section 611.720 (pages 1-3, 4-5, 6-8, 9-12, 13-15, 16-23, 24-28, 29-33, and 34-37 only). (Search for "600475008".) See also NTIS and USEPA, EMSL.~~

~~USEPA Method 1600, "Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl-b-D-Glucoside Agar (mEI)", September 2002, EPA 821/R-02/022 is an approved variation of Standard Methods, Method 9230 C, "Fecal Streptococcus and Enterococcus Groups, Membrane Filter Techniques" (which has not itself been approved for use by USEPA) (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1600sp02.pdf), referenced in Section 611.802. (Search for "821R02022".) See also NEMI and USEPA, Water Resource Center.~~

~~USEPA Method 1601, "Method 1601: Male-specific (F+) and Somatic Coliphage in Water by Two-step Enrichment Procedure", April 2001, EPA 821/R-01/030 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1601ap01.pdf), referenced in Section 611.802. (Search for "821R01030".) See also NEMI and USEPA, Water Resource Center.~~

~~USEPA Method 1602, "Method 1602: Male-specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL)~~

~~Procedure", April 2001, EPA 821/R-01/029 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1602ap01.pdf), referenced in Section 611.802. (Search for "821R01029".) See also NEMI and USEPA, Water Resource Center.~~

~~USEPA Method 1604, "Method 1604: Total Coliforms and Escherichia coli in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium)", September 2002, EPA 821/R-02/024 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1604sp02.pdf), referenced in Sections 611.802 and 611.1052. (Search for "821R02024".) See also NEMI and USEPA, Water Resource Center.~~

~~USEPA NERL Method 200.5, rev. 4.2, "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry", October 2003, EPA 600/R-06/115, referenced in Sections 611.611 and 611.612. (Search for "600R06115".) See also NEMI and USEPA, ORD.~~

~~USEPA NERL Method 415.3, rev. 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", February 2005, EPA 600/R-05/055, referenced in Section 611.381. (Search for "600R05055".) See also USEPA, ORD.~~

~~USEPA NERL Method 415.3, rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", September 2009, EPA 600/R-09/122, referenced in Section 611.381. (Search for "600R09122".) See also NEMI and USEPA, ORD.~~

~~USEPA NERL Method 525.3, ver. 1.0, "Determination of Total Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)", February 2012, EPA 600/R-12/010, referenced in Section 611.645. (Search for "600R12010".) See also USEPA, ORD.~~

~~USEPA OGWDW Methods, Method 302.0, "Determination of Bromate in Drinking Water Using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection", September 2009, EPA 815/B-09/014, referenced in Sections 611.381 and 611.382. (Search for "815B09014".) See also NEMI and USEPA, OGWDW.~~

~~USEPA Method 150.3, "Determination of pH in Drinking Water", February 2017, ver. 1.0, EPA 815/B-17/001, referenced in Sections 611.611. (Search for "815B17001".)~~

~~USEPA OGWDW Methods, Method 317.0, rev. 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis", July 2001, EPA 815/B-01/001, referenced in Sections 611.381 and 611.382. (Search for "815B01001".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 326.0, rev. 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis", June 2002, EPA 815/R-03/007, referenced in Sections 611.381 and 611.382. (Search for "815R03007".) See also NEMI, NTIS, and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 327.0, rev. 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry", May 2005, EPA 815/R-05/008, referenced in Sections 611.381 and 611.531. (Search for "815R05008".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 334.0, "Determination of Residual in Drinking Water Using an On-line Chlorine Analyzer", September 2009, EPA 815/B-09/013, referenced in Sections 611.381 and 611.531. (Search for "815B09013".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 515.4, rev. 1.0, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection", April 2000, EPA 815/B-00/001 (document file name "met515_4.pdf"), referenced in Section 611.645. (Search for "815B00001".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 523, ver. 1.0, "Determination of Triazine Pesticides and Other Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS)", February 2011, EPA 815/R-11/002, referenced in Section 611.645. (Search for "815R11002".) See also USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 524.3, rev. 1.0, "Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry", June 2009, EPA 815/B-09/009, referenced in Sections 611.381 and 611.645. (Search for "815B09009".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 524.4, "Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/Mass Spectrometry Using Nitrogen Purge Gas", May 2013, EPA 815/R-13/002, referenced in Sections 611.381 and 611.645. (Search for "815R13002".) See also USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 531.2, rev. 1.0, "Measurement of N-methylcarbamoyloximes and N-methylcarbamates in Water by Direct Aqueous Injection HPLC with Postcolumn Derivatization", September 2001, EPA 815/B-01/002 (document file name "met531_2.pdf"), referenced in Section 611.645. (Search for "815B01002".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 536, ver. 1.0, "Determination of Triazine Pesticides and Other Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)", October 2007, EPA 815/B-07/002, referenced in Section 611.645. (Search for "815R07002".) See also USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 552.3, rev. 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-Liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection", July 2003, EPA 815/B-03/002, referenced in Sections 611.381 and 611.645. (Search for "815B03002".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 557, "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry", September 2009, EPA 815/B-09/012, referenced in Sections 611.381, 611.382, and 611.645. (Search for "815B09012".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 1622 (01), "Cryptosporidium in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/026, referenced in Section 611.1007. (Search for "821R01026".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 1622 (05), "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA", December 2005, EPA 815/R-05/001, referenced in Sections 611.1004 and 611.1007. (Search for "815R05001".)~~

~~USEPA OGWDW Methods, Method 1623 (99), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", January 1999, EPA 821/R-99/006, referenced in Section 611.1007. (Search for "821R99006".) See also USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 1623 (01), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/025, referenced in Section 611.1007. (Search for "821R01025".) See also NEMI and USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 1623 (05), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", December 2005, EPA 815/R-05/002, referenced in Sections 611.1004 and 611.1007. (Search for "815R05002".) See also USEPA, OGWDW.~~

~~USEPA OGWDW Methods, Method 1623.1, "Method 1623.1: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", January 2012, EPA 816/R-12/001, referenced in Section 611.1004. (Search for "816R12001".) See also USEPA, OGWDW.~~

~~USEPA Organic and Inorganic Methods, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1", August 2000, EPA 815/R-00/014, referenced in Sections 611.362, 611.381, 611.611, and 611.645. (Methods 300.1 (rev. 1.0), 321.8 (rev. 1.0), and 515.3 (rev. 1.0) only.) (Search for "815R00014".) See also NEMI and NTIS.~~

~~USEPA Organic Methods, "Methods for the Determination of Organic Compounds in Drinking Water", December 1988, revised July 1991, EPA 600/4-88/039, referenced in Sections 611.645 and 611.648 (Methods 508A (rev. 1.0) and 515.1 (rev. 4.0) only) (Search for "600488039"); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement I", July 1990, EPA 600/4-90/020, referenced in Section 611.645 (Methods 547, 550, and 550.1 only) (Search for "600490020"); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement II", August 1992, EPA 600/R-92/129, referenced in Sections 611.381 and 611.645 (Methods 548.1 (rev. 1.0), 552.1 (rev. 1.0), and 555 (rev. 1.0) only) (Search for "600R92129"); "Methods for the Determination of Organic Compounds in Drinking~~

~~Water – Supplement III", August 1995, EPA 600/R-95/131, referenced in Sections 611.381 and 611.645 (Methods 502.2 (rev. 2.1), 504.1 (rev. 1.1), 505 (rev. 2.1), 506 (rev. 1.1), 507 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 515.2 (rev. 1.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 531.1 (rev. 3.1), 551.1 (rev. 1.0), and 552.2 (rev. 1.0) only) (Search for "600R95131"). See also NEMI; NTIS; and USEPA, EMSL.~~

~~USEPA Radioactivity Methods, "Prescribed Procedures for Measurement of Radioactivity in Drinking Water", August 1980, EPA 600/4-80/032, referenced in Section 611.720. (Methods 900.0, 901.0, 901.1, 902.0, 903.0, 903.1, 904.0, 905.0, 906.0, 908.0, 908.1 only.) (Search for "821R01026".) See also NEMI and NTIS.~~

~~USEPA Radiochemical Analyses, "Radiochemical Analytical Procedures for Analysis of Environmental Samples", March 1979, Doc. No. EMSL LV 053917, referenced in Section 611.720. (Pages 1-5, 19-32, 33-48, 65-73, 87-91, and 92-95 only.) (Search for "EMSLLV053917".) Also available from NTIS.~~

~~USEPA Radiochemistry Procedures, "Radiochemistry Procedures Manual", EPA 520/5-84-006, August 1984, Doc. No. PB84-215581, referenced in Section 611.720. (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04 only.) (Search for "520584006".) See also NEMI and NTIS.~~

~~USEPA Technical Notes, "Technical Notes on Drinking Water Methods", October 1994, EPA 600/R-94/173, referenced in Sections 611.531, 611.611, and 611.645. (Search for "821R94173".) See also NTIS.~~

~~BOARD NOTE: USEPA made the following assertion with regard to this reference at 40 CFR 141.23(k)(1) and 141.24(e) and (n)(11): "This document contains other analytical test procedures and approved analytical methods that remain available for compliance monitoring until July 1, 1996."~~

~~USEPA, OGWDW. United States Environmental Protection Agency, Office of Ground Water and Drinking Water (accessible on-line and available by download from www.epa.gov/dwanalyticalmethods/approved-drinking-water-analytical-methods).~~

~~USEPA OGWDW Methods, Method 302.0, "Determination of Bromate in Drinking Water Using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection", September 2009, EPA 815/B-09/014, referenced in Sections~~

~~611.381 and 611.382. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 317.0, rev. 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis", USEPA, July 2001, EPA 815/B-01/001, referenced in Sections 611.381 and 611.382. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 326.0, rev. 1.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis", USEPA, June 2002, EPA 815/R-03/007, referenced in Sections 611.381 and 611.382. See also NTIS and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 327.0, rev. 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry", USEPA, May 2005, EPA 815/R-05/008, referenced in Sections 611.381 and 611.531. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 334.0, "Determination of Residual in Drinking Water Using an On-line Chlorine Analyzer", USEPA, August 2009, EPA 815/B-09/013, referenced in Sections 611.381 and 611.531. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 515.4, rev. 1.0, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection", April 2000, EPA 815/B-00/001 (document file name "met515_4.pdf"), referenced in Section 611.645. See also NEMI and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 523, ver. 1.0, "Determination of Triazine Pesticides and Other Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS)", June 2009, EPA 815/B-09/009, referenced in Section 611.645. See also NEMI and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 524.3, rev. 1.0, "Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry", June 2009, EPA 815/B-09/009, referenced in Sections 611.381 and~~

~~611.645. See also NEMI and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 524.4, "Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/ Mass Spectrometry Using Nitrogen Purge Gas", May 2013, EPA 815/R-13/002, referenced in Sections 611.381 and 611.645. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 531.2, rev. 1.0, "Measurement of N-methylcarbamoyloximes and N-methylcarbamates in Water by Direct Aqueous Injection HPLC with Postcolumn Derivatization", September 2001, EPA 815/B-01/002 (document file name "met531_2.pdf"), referenced in Section 611.645. See also NEMI and USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 536, ver. 1.0, "Determination of Triazine Pesticides and Other Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)", October 2007, EPA 815/B-07/002, referenced in Section 611.645. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 552.3, rev. 1.0, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection", USEPA, July 2003, EPA 815/B-03/002, referenced in Sections 611.381 and 611.645.~~

~~USEPA OGWDW Methods, Method 557, "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry", September 2009, EPA 815-B-09-012, referenced in Sections 611.381, 611.382, and 611.645. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1622 (05), "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA", December 2005, EPA 815/R-05/001, referenced in Sections 611.1004 and 611.1007. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1622 (01), "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/026, referenced in Section 611.1007. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1622 (99), "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA", April 1999, EPA 821/R-99/001, referenced in Section 611.1007.~~

~~USEPA OGWDW Methods, Method 1623 (05), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", December 2005, EPA 815/R-05/002, referenced in Sections 611.1004 and 611.1007. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1623 (01), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", April 2001, EPA 821/R-01/025, referenced in Section 611.1007. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1623 (99), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", January 1999, EPA 821/R-99/006, referenced in Section 611.1007. See also USEPA, NSCEP.~~

~~USEPA OGWDW Methods, Method 1623.1, "Method 1623.1: Cryptosporidium and Giardia in Water by Filtration/IMS/FA", January 2012, EPA 816/R-12/001, referenced in Section 611.1004. See also USEPA, NSCEP.~~

~~BOARD NOTE: Many of the above-listed documents available from the USEPA, Office of Ground Water and Drinking Water are also listed as available from USEPA, NSCEP and NTIS.~~

~~USEPA, ORD. USEPA, Office of Research and Development, National Exposure Research Laboratory, Microbiological & Chemical Exposure Assessment Research Division (accessible on-line and available by download from www.epa.gov/water-research/epa-drinking-water-researchmethods, with the exception of USEPA NERL Method 549.2, rev. 1.0).~~

~~USEPA NERL Method 200.5, rev. 4.2, "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry", October 2003, EPA 600/R-06/115, referenced in Sections 611.611 and 611.612. See also USEPA, NSCEP.~~

~~USEPA NERL Method 415.3, rev. 1.1, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", February 2005, EPA 600/R-05/055, referenced in Section 611.381. See also USEPA, NSCEP.~~

~~USEPA NERL Method 415.3, rev. 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water", September 2009, EPA 600/R-09/122, referenced in Section 611.381. See also NEMI and USEPA, NSCEP.~~

~~USEPA NERL Method 525.3, ver. 1.0, “Determination of Total Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatography/Mass Spectrometry (GC/MS)”, February 2012, EPA 600/R-12/010, referenced in Section 611.645. See also USEPA, NSCEP.~~

~~USEPA NERL Method 549.2, rev. 1.0, “Determination of Diquat and Paraquat in Drinking Water by Liquid-Solid Extraction and High Performance Liquid Chromatography with Ultraviolet Detection”, June 1997, referenced in Section 611.645. See also NEMI.~~

~~USEPA, Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW, Washington, DC 20460:~~

~~E*Colite Test, “Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Drinking Water”, January 9, 1998, referenced in Sections 611.802 and 611.1052. See also Charm Sciences, Inc.~~

~~m-ColiBlue24 Test, “Total Coliforms and E. coli Membrane Filtration Method with m-ColiBlue24® Broth”, Method No. 10029, rev. 2, August 17, 1999, referenced in Sections 611.802 and 611.1052. See also The Hach Company.~~

~~USEPA Method 1600, “Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl-b-D-Glucoside Agar (mEI)”, September 2002, EPA 821/R-02/022 is an approved variation of Standard Methods, Method 9230 C, “Fecal Streptococcus and Enterococcus Groups, Membrane Filter Techniques” (which has not itself been approved for use by USEPA) (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1600sp02.pdf), referenced in Section 611.802. See also USEPA, NSCEP.~~

~~USEPA Method 1601, “Method 1601: Male-specific (F^{+}) and Somatic Coliphage in Water by Two-step Enrichment Procedure”, April 2001, EPA 821/R-01/030 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1601ap01.pdf), referenced in Section 611.802. See also USEPA, NSCEP.~~

~~USEPA Method 1602, “Method 1602: Male-specific (F^{+}) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure”, April 2001, EPA 821/R-01/029 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1602ap01.pdf), referenced in Section 611.802. See also USEPA, NSCEP.~~

~~USEPA Method 1604, "Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium)", September 2002, EPA 821/R-02/024 (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1604sp02.pdf), referenced in Sections 611.802 and 611.1052. See also USEPA, NSCEP.~~

~~USGS. United States Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.~~

~~Open File Report 93-125, method available upon request by method number from "Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory — Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments", 1993. Available on-line as a digital document at https://pubs.usgs.gov/of/1993/0125/report.pdf.~~

~~USGS Method I-2601-90, "Phosphorus, orthophosphate, colorimetry, phosphomolybdate, automated-segment-flow," referenced in Section 611.611.~~

~~USGS Techniques of Water-Resource Investigation: 05-A1, methods available upon request by method number from Book 5, Chapter A-1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments", 3rd ed., 1989. Available on-line as a digital document at https://pubs.usgs.gov/twri/twri5-a1/pdf/TWRI_5-A1.pdf.~~

~~USGS Method I-1030-85, "Alkalinity, electrometric titration", I-1030-85, referenced in Section 611.611.~~

~~USGS Method I-1601-85, "Phosphorus, orthophosphate, colorimetric, phosphomolybdate", I-1601-85, referenced in Section 611.611.~~

~~USGS Method I-1700-85, "Silica, colorimetric, molybdate blue", I-1700-85, referenced in Section 611.611.~~

~~USGS Method I-2598-85, "Phosphorus, orthophosphate, colorimetric, phosphomolybdate, automated-discrete", I-2598-85, referenced in Section 611.611.~~

~~USGS Method I-2700-85, "Silica, colorimetric, molybdate blue, automated-segmented flow", I-2700-85, referenced in Section 611.611.~~

~~USGS Method I-3300-85, "Cyanide, colorimetric, pyridine-~~

~~pyrazolone", I-3300-85, referenced in Section 611.611.~~

~~USGS Techniques of Water-Resource Investigation: 05-A5, methods available upon request by method number from Book 5, Chapter A-5, "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments", 1977. Available on-line as a digital document at https://pubs.usgs.gov/twri/twri5a5/pdf/TWRI_5-A5.pdf.~~

~~USGS Method R-1110-76, "Cesium-137 and cesium-134, dissolved. Inorganic ion-exchange method – gamma counting", R-1110-76, referenced in Section 611.720.~~

~~USGS Method R-1111-76, "Radiocesium, dissolved, as cesium-137. Inorganic ion-exchange method – beta counting". R-1111-76, referenced in Section 611.720.~~

~~USGS Method R-1120-76, "Gross alpha and beta radioactivity, dissolved and suspended", R-1120-76, referenced in Section 611.720.~~

~~USGS Method R-1140-76, "Radium, dissolved, as radium-226. Precipitation method", R-1140-76, referenced in Section 611.720.~~

~~USGS Method R-1141-76, "Radium-226, dissolved. Radon emanation method", R-1141-76, referenced in Section 611.720.~~

~~USGS Method R-1142-76, "Radium-228, dissolved. Determination by separation and counting of actinium-228", R-1142-76, referenced in Section 611.720.~~

~~USGS Method R-1160-76, "Strontium-90, dissolved. Chemical separation and precipitation method", R-1160-76, referenced in Section 611.720.~~

~~USGS Method R-1171-76, "Tritium. Liquid scintillation, Denver lab method – gamma counting", R-1171-76, referenced in Section 611.720.~~

~~USGS Method R-1180-76, "Uranium, dissolved. Fluorometric method – direct", R-1180-76, referenced in Section 611.720.~~

~~USGS Method R-1181-76, "Uranium, dissolved. Fluorometric method – extraction procedure", R-1181-76, referenced in Section 611.720.~~

~~USGS Method R-1182-76, "Uranium, dissolved, isotopic ratios. Alpha spectrometry – chemical separation", R-1182-76, referenced in Section 611.720.~~

~~BOARD NOTE: USGS methods are freely available for download in an electronic format from the USGS Publications Warehouse, at pubs.er.usgs.gov/. Sections 611.611 and 611.720 do not distinguish the volume in which each USGS method appears. The distinction as to which volume where a particular method appears is made in this incorporation by reference.~~

~~Waters Corporation, Technical Services Division, 34 Maple St., Milford, MA 01757 (800-252-4752 or 508-478-2000, www.waters.com).~~

~~Waters Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography", Method B-1011, August 1987, referenced in Section 611.611.~~

b~~c~~) The Board incorporates the following federal regulations by reference:

40 CFR 3.3 (2019) ~~(2017)~~ (What Definitions Are Applicable to This Part?), referenced in Section 611.105.

40 CFR 3.10 (2019) ~~(2017)~~ (What Are the Requirements for Electronic Reporting to EPA?), referenced in Section 611.105.

40 CFR 3.2000 (2019) ~~(2017)~~ (What Are the Requirements Authorized State, Tribe, and Local Programs' Reporting Systems Must Meet?), referenced in Section 611.105.

40 CFR 136.3(a) (2019) ~~(2017)~~, referenced in Section 611.1004.

Appendix B to 40 CFR 136 (2019) ~~(2017)~~, referenced in Sections 611.359, 611.609, and 611.646.

40 CFR 141.21(f)(6)(i) and (f)(6)(ii) (2019), referenced in Section 611.802.

40 CFR 142.20(b)(1) (2019) ~~(2017)~~, referenced in Section 611.112.

Subpart G of 40 CFR 142 (2019) ~~(2017)~~, referenced in Section 611.113.

c) The Board incorporates the following federal statutory provision by reference:

42 USC 300g-6(d) and (e) (2017).

d) This Part incorporates no later amendments or editions.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.105 Electronic Reporting

The submission of any document under ~~pursuant to~~ any provision of this Part as an electronic document in lieu of a paper document is subject to this Section.

a) Scope and Applicability~~.~~

1) The USEPA, the Board, or the Agency may allow for the submission of electronic documents in lieu of paper documents. This Section does not require submission of electronic documents in lieu of paper documents. This Section sets forth the requirements for the optional electronic submission of any document that must be submitted to the appropriate of the following:

A) To USEPA directly under Title 40 of the Code of Federal Regulations; or

B) To the Board or the Agency under ~~pursuant to~~ any provision of 35 Ill. Adm. Code 702 through 705, 720 through 728, 730, 733, 738, or 739.

2) Electronic document submission under this Section can occur only as follows:

A) For submissions of documents to USEPA, submissions may occur only after USEPA has published a notice in the Federal Register announcing that USEPA is prepared to receive, in an electronic format, documents required or permitted by the identified part or subpart of Title 40 of the Code of Federal Regulations; or

B) For submissions of documents to the State, submissions may occur only under the following circumstances: the Board or the Agency may use any electronic document receiving system for which USEPA has granted approval under ~~pursuant to~~ 40 CFR 3.1000, so long as the system complies with 40 CFR 3.2000, incorporated by reference in Section 611.102(c), and USEPA has not withdrawn its approval of the system in writing.

3) This Section does not apply to any of the following documents, whether or not the document is a document submitted to satisfy the requirements cited in subsection (a)(1):

A) Any document submitted via fascimile;

B) Any document submitted via magnetic or optical media, such as diskette, compact disc, digital video disc, or tape; or

C) Any data transfer between USEPA, any state, or any local government and either the Board or the Agency as part of administrative arrangements between the parties to the transfer to share data.

4) Upon USEPA conferring written approval for the submission of any types of documents as electronic documents in lieu of paper documents, as described in subsection (a)(2)(B)(iii), the Agency or the Board, as appropriate, must publish a Notice of Public Information in the Illinois Register that describes the documents approved for submission as electronic documents, the electronic document receiving system approved to receive them, the acceptable formats and procedures for their submission, and, as applicable, the date on which the Board or the Agency will begin to receive those submissions. In the event of written cessation of USEPA approval for receiving any type of document as an electronic document in lieu of a paper document, the Board or the Agency must similarly cause publication of a Notice of Public Information in the Illinois Register.

BOARD NOTE: Subsection (a) is derived from 40 CFR 3.1, 3.2, 3.10, 3.20, and 3.1000 ~~(2016)~~.

b) Definitions. For the purposes of this Section, terms will have the meaning attributed them in 40 CFR 3.3, incorporated by reference in 35 Ill. Adm. Code 611.102(c).

c) Procedures for Submission ~~submission~~ of Electronic Documents ~~electronic documents~~ in Lieu ~~lieu~~ of Paper Documents ~~paper documents~~ to USEPA. Except as provided in subsection (a)(3), any person who is required under Title 40 of the Code of Federal Regulations to create and submit or otherwise provide a document to USEPA may satisfy this requirement with an electronic document, in lieu of a paper document, provided the following conditions are met:

1) The person satisfies the requirements of 40 CFR 3.10, incorporated by reference in Section 611.102(c); and

2) USEPA has first published a notice in the Federal Register as described in subsection (a)(2)(A).

BOARD NOTE: Subsection (c) is derived from 40 CFR 3.2(a) and subpart B of 40 CFR 3 ~~(2016)~~.

d) Procedures for Submission ~~submission~~ of Electronic Documents ~~electronic documents~~ in Lieu ~~lieu~~ of Paper Documents ~~paper documents~~ to the Board or the Agency.

1) The Board or the Agency may, but is not required to, establish procedural rules for the electronic submission of documents. The Board or the

Agency must establish any such procedural rules under the Administrative Procedure Act [5 ILCS 100/Art. 5].

2) The Board or the Agency may accept electronic documents under this Section only as provided in subsection (a)(2)(B).

BOARD NOTE: Subsection (d) is derived from 40 CFR 3.2(b) and subpart D of 40 CFR 3 ~~(2016)~~.

e) Effects of Submission ~~submission~~ of an Electronic Document ~~electronic document~~ in Lieu ~~lieu~~ of Paper Documents ~~paper documents.~~

1) If a person who submits a document as an electronic document fails to comply with the requirements of this Section, that person is subject to the penalties prescribed for failure to comply with the requirement that the electronic document was intended to satisfy.

2) Where a document submitted as an electronic document to satisfy a reporting requirement bears an electronic signature, the electronic signature legally binds, obligates, and makes the signer responsible to the same extent as the signer's handwritten signature would on a paper document submitted to satisfy the same reporting requirement.

3) Proof that a particular signature device was used to create an electronic signature will suffice to establish that the individual uniquely entitled to use the device did so with the intent to sign the electronic document and give it effect.

4) Nothing in this Section limits the use of electronic documents or information derived from electronic documents as evidence in enforcement or other proceedings.

BOARD NOTE: Subsection (e) is derived from 40 CFR 3.4 and 3.2000(c) ~~(2016)~~.

f) Public Document Subject ~~document subject~~ to State Laws ~~laws~~. Any electronic document filed with the Board is a public document. The document, its submission, its retention by the Board, and its availability for public inspection and copying are subject to various State laws, including, but not limited to, the following:

1) The Administrative Procedure Act [5 ILCS 100];

2) The Freedom of Information Act [5 ILCS 140];

3) The State Records Act [5 ILCS 160];

4) The Electronic Commerce Security Act [5 ILCS 175];

5) The Environmental Protection Act;

6) Regulations relating to public access to Board records (2 Ill. Adm. Code 2175); and

7) Board procedural rules relating to protection of trade secrets and confidential information (35 Ill. Adm. Code 130).

g) Nothing in this Section or in any provisions adopted under ~~pursuant to~~ subsection (d)(1) will create any right or privilege to submit any document as an electronic document.

BOARD NOTE: Subsection (g) is derived from 40 CFR 3.2(c) ~~(2016)~~.

BOARD NOTE: Derived from 40 CFR 3 and 142.10(g) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.111 Relief Equivalent to SDWA Section 1415(a) Variances

This Section is intended to describe how the Board grants State relief equivalent to that available from USEPA under section 1415(a)(1)(A) and (a)(1)(B) of the SDWA (42 USC 300g-4(a)(1)(A) and (a)(1)(B)). SDWA section 1415 variances do not require ultimate compliance within five years in every situation. Variances under Sections 35 through 37 of the Act do require compliance within five years in every case. Consequently, a PWS may have the option of seeking State regulatory relief equivalent to a SDWA section 1415 variance through one of three procedural mechanisms: a variance under Sections 35 through 37 ~~35through 37~~ of the Act ~~[415 ILCS 5/35-37]~~ and Subpart B of 35 Ill. Adm. Code 104; a site-specific rule under Sections 27and 28 of the Act and 35 Ill. Adm. Code 102; or an adjusted standard under Section 28.1 of the Act and Subpart D of 35 Ill. Adm. Code 104.

a) The Board will grant a PWS a variance, a site-specific rule, or an adjusted standard from an MCL or a treatment technique under ~~pursuant to~~ this Section.

1) The PWS must file a petition under ~~pursuant to~~ 35 Ill. Adm. Code 102 or 104, as applicable.

2) If a State requirement does not have a federal counterpart, the Board may grant relief from the State requirements without following this Section.

b) Relief from an MCL~~.~~

1) As part of the justification for relief from an MCL under this Section, the PWS must demonstrate the following:

A) Because of characteristics of the raw water sources and alternative sources that are reasonably available to the system, the PWS cannot meet the MCL; and

B) The PWS will install or has installed the best available technology (BAT) (as identified in Subpart F), treatment technique, or other means that the Agency finds available. BAT may vary depending on the following:

i) The number of persons served by the system;

ii) Physical conditions related to engineering feasibility; and

iii) Costs of compliance; and

C) The variance will not result in an unreasonable risk to health.

2) In any order granting relief under this subsection, the Board will prescribe a schedule for the following:

A) Compliance, including increments of progress, by the PWS, with each MCL with respect to which the relief was granted; and

B) Implementation by the PWS of each additional control measure for each MCL with respect to which the relief is granted, during the period ending on the date compliance with such requirement is required.

3) Schedule of Compliance ~~compliance~~ for Relief ~~relief~~ from an MCL~~.~~

A) A schedule of compliance will require compliance with each MCL with respect to which the relief was granted as expeditiously as practicable.

B) If the Board prescribes a schedule requiring compliance with an MCL for which the relief is granted later than five years from the date of issuance of the relief, the Board will do the following:

i) Document its rationale for the extended compliance schedule;

ii) Discuss the rationale for the extended compliance schedule in the required public notice and opportunity for public hearing; and

iii) Provide the shortest practicable time schedule feasible under the circumstances.

c) Relief from a Treatment Technique Requiremen ~~treatment technique requirement.~~

1) As part of the justification for relief from a treatment technique requirement under this Section, the PWS must demonstrate that the

treatment technique is not necessary to protect the health of persons served because of the nature of the raw water source.

2) The Board may prescribe monitoring and other requirements as a condition for relief from a treatment technique requirement.

d) The Board will hold at least one public hearing. In addition the Board will accept comments as appropriate under ~~pursuant to~~ 35 Ill. Adm. Code 102 or 104.

e) The Board will not grant relief from any of the following:

1) From the MCLs for total coliforms and E. coli. The Board can no longer grant relief from the total coliform MCL.

BOARD NOTE: As provided in Section 611.131(c)(1) and 40 CFR 142.304(a), a small system variance is not available for rules that address microbial contaminants, which include Subparts B, R, S, X, Z, and AA ~~of this Part~~.

2) From any of the treatment technique requirements of Subpart B.

3) From the residual disinfectant concentration (RDC) requirements of Sections 611.241(c) and 611.242(b).

f) The Agency must promptly send USEPA the opinion and order of the Board granting relief under ~~pursuant to~~ this Section. The Board may reconsider and modify a grant of relief, or relief conditions, if USEPA notifies the Board of a finding under ~~pursuant to~~ section 1415 of the SDWA (42 USC 300g-4).

g) In addition to the requirements of this Section, the provisions of Section 611.130 or 611.131 may apply to relief granted under ~~pursuant to~~ this Section.

BOARD NOTE: Derived from 40 CFR 141.4 ~~(2016)~~, from section 1415(a)(1)(A) and (a)(1)(B) of the SDWA (42 USC 300g-4(a)(1)(A) and (a)(1)(B) ~~(2015)~~) and from the ~~"~~Guidance Manual for Filtration and Disinfection (91)~~"~~, incorporated by reference in Section 611.102 and available from USEPA, NSCEP. USEPA has established a procedure at 40 CFR 142.23 ~~(2016)~~ to review and potentially modify or nullify state determinations granting relief from NPDWRs where USEPA finds that the state has abused its discretion or failed to prescribe required schedules for compliance in a substantial number of instances.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.112 Relief Equivalent to SDWA Section 1416 Exemptions

This Section is intended to describe how the Board grants State relief equivalent to that available from USEPA under section 1416 of the SDWA (42 USC 300g-5). SDWA section 1416 exemptions do not require ultimate compliance within five years in every situation. Variances under Sections 35through 37 of the Act do require compliance within five years in every case.

Consequently, a PWS may have the option of seeking State regulatory relief equivalent to a SDWA section 1416 exemption through one of three procedural mechanisms: a variance under Sections 35through 37 of the Act and Subpart B of 35 Ill. Adm. Code 104; a site-specific rule under Sections 27and 28 of the Act and 35 Ill. Adm. Code 102; or an adjusted standard under Section 28.1 of the Act and Subpart D of 35 Ill. Adm. Code 104.

a) The Board will grant a PWS a variance, a site-specific rule, or an adjusted standard from an MCL or treatment technique requirement, or from both, under ~~pursuant to~~ this Section.

1) The PWS must file a petition under ~~pursuant to~~ 35 Ill. Adm. Code 102 or 104, as applicable.

2) If a State requirement does not have a federal counterpart, the Board may grant relief from the State requirements without following this Section.

b) As part of the justification for relief under this Section, the PWS must demonstrate the following:

1) Due to compelling factors (which may include economic factors), the PWS is unable to comply with the MCL or treatment technique requirement, or to implement measures to develop an alternative source of water supply;

2) The PWS was either of the following:

A) In operation on the effective date of the MCL or treatment technique requirement; or

B) Not in operation on the effective date of the MCL or treatment technique requirement and no reasonable alternative source of drinking water is available to the PWS;

3) The relief will not result in an unreasonable risk to health; and

4) Management or restructuring changes cannot reasonably be made that will result in compliance with the NPDWR or, if compliance cannot be achieved, improve the quality of the drinking water.

BOARD NOTE: In determining that management or restructuring changes cannot reasonably be made that will result in compliance with the NPDWR, the Board will consider the factors required by USEPA under 40 CFR 142.20(b)(1), incorporated by reference in Section 611.102(c).

c) In any order granting relief under this Section, the Board will prescribe a schedule for the following:

1) Compliance, including increments of progress, by the PWS, with each MCL and treatment technique requirement with respect to which the relief was granted; and

2) Implementation by the PWS, of each additional control measure for each contaminant subject to the MCL or treatment technique requirement, with respect to which relief is granted.

d) Schedule of Compliance ~~compliance~~. A schedule of compliance will require compliance with each MCL or treatment technique requirement with respect to which relief was granted as expeditiously as practicable, but not later than three years after the otherwise applicable compliance date established in section 1412(b)(10) of the SDWA (42 USC 300g-1(b)(10)), except as follows:

1) No relief may be granted unless the PWS establishes that it is taking all practicable steps to meet the NPDWR; and

A) The PWS cannot meet the NPDWR without capital improvements that cannot be completed within 12 months;

B) In the case of a PWS that needs financial assistance for the necessary improvements, the PWS has entered into an agreement to obtain such financial assistance; or

C) The PWS has entered into an enforceable agreement to become a part of a regional PWS.

2) In the case of a PWS that serves 3,300 or fewer persons that needs financial assistance for the necessary improvements, relief may be renewed for one or more additional two year periods, not to exceed a total of six years, if the PWS establishes that it is taking all practicable steps to meet the final date for compliance.

3) A PWS may not receive relief under this Section if the PWS was granted relief under Section 611.111 or 611.131.

e) The Board will hold at least one public hearing. In addition the Board will accept comments as appropriate under ~~pursuant to~~ 35 Ill. Adm. Code 102 or 104.

f) The Agency must promptly send USEPA the Opinion and Order of the Board granting relief under ~~pursuant to~~ this Section. The Board may reconsider and modify a grant of relief, or relief conditions, if USEPA notifies the Board of a finding under ~~pursuant to~~ section 1416 of the SDWA (42 USC 300g-5).

BOARD NOTE: Derived from section 1416 of the SDWA (42 USC 300g-5 ~~(2011)~~).

g) The Board will not grant relief from any of the following:

1) From the MCLs for total coliforms and E. coli. The Board can no longer grant relief from the total coliform MCL.

BOARD NOTE: As provided in Section 611.131(c)(1) and 40 CFR 142.304(a), a small system variance is not available for rules that address microbial contaminants, which include Subparts B, R, S, X, Z, and AA ~~of this Part~~.

2) From any of the treatment technique requirements of Subpart B.

3) From the residual disinfectant concentration (RDC) requirements of Sections 611.241(c) and 611.242(b).

h) In addition to the requirements of this Section, the provisions of Section 611.130 or 611.131 may apply to relief granted under ~~pursuant to~~ this Section.

BOARD NOTE: Derived from 40 CFR 141.4 ~~(2016)~~. USEPA has established a procedure at 40 CFR 142.23 ~~(2016)~~ to review and potentially modify or nullify state determinations granting relief from NPDWRs where USEPA finds that the state has abused its discretion or failed to prescribe required schedules for compliance in a substantial number of instances.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.113 Alternative Treatment Techniques

This Section is intended to be equivalent to section 1415(a)(3) of the SDWA (42 USC 300g-4(a)(3)).

a) under ~~pursuant to~~ this Section, the Board may grant an adjusted standard from a treatment technique requirement.

b) The supplier seeking an adjusted standard must file a petition under ~~pursuant to~~ Subpart D of 35 Ill. Adm. Code 104.

c) As justification the supplier must demonstrate that an alternative treatment technique is at least as effective in lowering the level of the contaminant with respect to which the treatment technique requirement was prescribed.

d) As a condition of any adjusted standard, the Board will require the use of the alternative treatment technique.

e) The Board will grant adjusted standards for alternative treatment techniques subject to the following conditions:

1) All adjusted standards must be subject to the limitations of 40 CFR 142, Subpart G, incorporated by reference in Section 611.102; and

2) All adjusted standards must be subject to review and approval by USEPA under ~~pursuant to~~ 40 CFR 142.46 before they become effective.

BOARD NOTE: Derived from section 1415(a)(3) of the SDWA (42 USC 300g-4(a)(3)).

f) The provisions of Section 611.130 apply to determinations made under ~~pursuant to~~ this Section.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.114 Siting Requirements

Before a person enters into a financial commitment for or initiates construction of a new PWS or increases the capacity of an existing PWS, the person must obtain a construction permit under ~~pursuant to~~ 35 Ill. Adm. Code 602.101 and, to the extent practicable, avoid locating part or all of the new or expanded facility at a site of which the following is true:

a) Is subject to a significant risk from earthquakes, floods, fires, or other disasters that could cause a breakdown of the PWS or a portion of the PWS. As used in this subsection, "significant risk" means a greater risk to the new or expanded facility than would exist at other locations within the area served by the PWS; or

b) Except for intake structures, is within the floodplain of a 100-year flood.

BOARD NOTE: Derived from 40 CFR 141.5 ~~(2002)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.121 Maximum Contaminant Levels

a) Maximum Contaminant Levels.~~:~~ No person may cause or allow water that is delivered to any user to exceed the MCL for any contaminant.

b) An MCL for a particular contaminant applies in lieu of any finished water quality narrative standard.

BOARD NOTE: Derived from the definition of "MCL" in 40 CFR 141.2 ~~(2002) and former 35 Ill. Adm. Code 604.201, repealed in R88-26, at 14 Ill. Reg. 16435, effective September 20, 1990~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.126 Prohibition on Use of Lead

a) In General ~~general~~. Prohibition. Any pipe, any pipe or plumbing fitting or fixture, any solder or any flux must be lead free, as defined by subsection (b), if it is used ~~after June 19, 1986~~ in the installation or repair of either of the following:

1) Any PWS; or

2) Any plumbing in a residential or nonresidential facility providing water for human consumption that is connected to a PWS. This subsection (a) does not apply to leaded joints necessary for the repair of cast iron pipes.

b) Definition of Lead Free ~~lead free~~. For purposes of this Section, the term "lead free" means as follows:

1) When used with respect to solders and flux, refers to solders and flux containing not more than 0.2 percent lead; and

2) When used with respect to pipes and pipe fittings, refers to pipes and pipe fittings containing not more than 0.25 ~~8.0~~ percent lead.~~; and~~

3) The weighted average lead content of a pipe, pipe fitting, plumbing fitting, or fixture must be calculated by using the following formula: For each wetted component, the percentage of lead in the component must be multiplied by the ratio of the wetted surface area of that component to the total wetted surface area of the entire product to arrive at the weighted percentage of lead of the component. The weighted percentage of lead of each wetted component must be added together, and the sum of these weighted percentages will constitute the weighted average lead content of the product. The lead content of the material used to produce wetted components is used to determine compliance with subsection (b)(2). For lead content of materials that are provided as a range, the maximum content of the range must be used.~~When used with respect to plumbing fittings and fixtures that are intended by the manufacturer to dispense water for human ingestion, refers to plumbing fittings and fixtures in compliance with NSF Standard 61, section 9, incorporated by reference in Section 611.102.~~

BOARD NOTE: Derived from 40 CFR 141.43(a) and (d) ~~(2016)~~, and section 1417 of SDWA, 42 USC 300g-6(a)(1), (d), and (e) ~~(2015)~~. Congress changed the lead standards for fittings and fixtures in for the Reduction of Lead in Drinking Water Act, P.A. 111-380, § 2(a)(2) and (b), 124 Stat. 4131 (Jan. 4, 2011). The Board incorporated the statutory changes into this Section. ~~USEPA has stated that NSF Standard 61 is the standard developed pursuant to 42 USC 300g-6(e). See 62 Fed. Reg. 44684 (Aug. 22, 1997).~~

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.130 Special Requirements for Certain Variances and Adjusted Standards

a) Relief from the Fluoride ~~fluoride~~ MCL~~.~~

1) In granting any variance or adjusted standard to a supplier that is a CWS from the maximum contaminant level for fluoride listed in Section 611.301(b), the Board will require application of the best available technology (BAT) identified at subsection (a)(4) for that constituent as a condition to the relief, unless the supplier has demonstrated through

comprehensive engineering assessments that application of BAT is not technically appropriate and technically feasible for that supplier.

2) The Board will require the following as a condition for relief from the fluoride MCL where it does not require the application of BAT:

A) That the supplier continue to investigate the following methods as an alternative means of significantly reducing the level of fluoride, according to a definite schedule:

i) A modification of lime softening;

ii) Alum coagulation;

iii) Electrodialysis;

iv) Anion exchange resins;

v) Well field management;

vi) The use of alternative sources of raw water; and

vii) Regionalization; and

B) That the supplier report results of that investigation to the Agency.

3) The Agency must petition the Board to reconsider or modify a variance or adjusted standard, under ~~pursuant to~~ Subpart I of 35 Ill. Adm. Code 101, if it determines that an alternative method identified by the supplier under ~~pursuant to~~ subsection (a)(2) is technically feasible and would result in a significant reduction in fluoride.

4) Best available technology for fluoride reduction is as follows:

A) Activated alumina absorption centrally applied; and

B) Reverse osmosis centrally applied.

BOARD NOTE: Subsection (a) derived from 40 CFR 142.61 ~~(2016)~~.

b) Relief from an IOC, VOC, or SOC MCL~~.~~

1) In granting to a supplier that is a CWS or NTNCWS any variance or adjusted standard from the maximum contaminant levels for any VOC or SOC, listed in Section 611.311(a) or (c), or for any IOC, listed in Section 611.301, the supplier must have first applied the best available technology (BAT) identified at Section 611.311(b) (VOCs and SOCs) or Section 611.301(c) (IOCs) for that constituent, unless the supplier has demonstrated through comprehensive engineering assessments that

application of BAT would achieve only a minimal and insignificant reduction in the level of contaminant.

BOARD NOTE: USEPA lists BAT for each SOC and VOC at 40 CFR 142.62(a), for the purposes of variances and exemptions (adjusted standards). That list is identical to the list at 40 CFR 141.61(b).

2) The Board may require any of the following as a condition for relief from an MCL listed in Section 611.301 or 611.311:

A) That the supplier continue to investigate alternative means of compliance according to a definite schedule; and

B) That the supplier report results of that investigation to the Agency.

3) The Agency must petition the Board to reconsider or modify a variance or adjusted standard, under ~~pursuant to~~ Subpart I of 35 Ill. Adm. Code 101, if it determines that an alternative method identified by the supplier under ~~pursuant to~~ subsection (b)(2) is technically feasible.

BOARD NOTE: Subsection (b) derived from 40 CFR 142.62(a) through (e) ~~(2016)~~.

c) Conditions Requiring Use ~~requiring use~~ of Bottled Water, ~~bottled water,~~ a Point-of-Use Treatment Device, ~~point-of-use treatment device,~~ or a Point-of-Entry Treatment Device ~~point-of-entry treatment device~~. In granting any variance or adjusted standard from the maximum contaminant levels for organic and inorganic chemicals or an adjusted standard from the treatment technique for lead and copper, the Board may impose certain conditions requiring the use of bottled water, a point-of-entry treatment device, or a point-of-use treatment device to avoid an unreasonable risk to health, limited as provided in subsections (d) and (e).

1) Relief from an MCL. The Board may, when granting any variance or adjusted standard from the MCL requirements of Sections 611.301 and 611.311, impose a condition that requires a supplier to use bottled water, a point-of-entry treatment device, a point-of-use treatment device, or other means to avoid an unreasonable risk to health.

2) Relief from Corrosion Control Treatment ~~corrosion control treatment~~. The Board may, when granting an adjusted standard from the corrosion control treatment requirements for lead and copper of Sections 611.351 and 611.352, impose a condition that requires a supplier to use bottled water, a point-of-use treatment device, or other means, but not a point-of-entry treatment device, to avoid an unreasonable risk to health.

3) Relief from Source Water Treatment ~~source water treatment~~ or Service Line Replacement ~~service line replacement~~. The Board may, when

granting an exemption from the source water treatment and lead service line replacement requirements for lead and copper under Sections 611.353 or 611.354, impose a condition that requires a supplier to use a point-of-entry treatment device to avoid an unreasonable risk to health.

BOARD NOTE: Subsection (c) derived from 40 CFR 142.62(f) ~~(2016)~~.

d) Use of Bottled Water ~~bottled water~~. Suppliers that propose to use or use bottled water as a condition for receiving a variance or an adjusted standard from the requirements of Section 611.301 or Section 611.311 or an adjusted standard from the requirements of Sections 611.351 through 611.354 must meet the requirements of either subsections (d)(1), (d)(2), (d)(3), and (d)(6) or (d)(4), (d)(5), and (d)(6).

1) The supplier must develop a monitoring program for Board approval that provides reasonable assurances that the bottled water meets all MCLs of Sections 611.301 and 611.311 and submit a description of this program as part of its petition. The proposed program must describe how the supplier will comply with each requirement of this subsection (d).

2) The supplier must monitor representative samples of the bottled water for all contaminants regulated under Sections 611.301 and 611.311 during the first three-month period that it supplies the bottled water to the public, and annually thereafter.

3) The supplier must annually provide the results of the monitoring program to the Agency.

4) The supplier must receive a certification from the bottled water company as to each of the following:

A) That the bottled water supplied has been taken from an approved source of bottled water, as such is defined in Section 611.101;

B) That the approved source of bottled water has conducted monitoring in accordance with 21 CFR 129.80(g)(1) through (g)(3); and

C) That the bottled water does not exceed any MCLs or quality limits as set out in 21 CFR 165.110, 110, and 129.

5) The supplier must provide the certification required by subsection (d)(4) to the Agency during the first quarter after it begins supplying bottled water and annually thereafter.

6) The supplier must assure the provision of sufficient quantities of bottled water to every affected person supplied by the supplier via door-to-door bottled water delivery.

BOARD NOTE: Subsection (d) derived from 40 CFR 142.62(g)~~ (2016)~~.

e) Use of a Point-of-Entry Treatment Device ~~point-of-entry treatment device~~. Before the Board grants any PWS a variance or adjusted standard from any NPDWR that includes a condition requiring the use of a point-of-entry treatment device, the supplier must demonstrate to the Board each of the following:

1) That the supplier will operate and maintain the device;

2) That the device provides health protection equivalent to that provided by central treatment;

3) That the supplier will maintain the microbiological safety of the water at all times;

4) That the supplier has established standards for performance, conducted a rigorous engineering design review, and field tested the device;

5) That the operation and maintenance of the device will account for any potential for increased concentrations of heterotrophic bacteria resulting through the use of activated carbon, by backwashing, post-contactor disinfection, and heterotrophic plate count monitoring;

6) That buildings connected to the supplier's distribution system have sufficient devices properly installed, maintained, and monitored to assure that all consumers are protected; and

7) That the use of the device will not cause increased corrosion of lead and copper bearing materials located between the device and the tap that could increase contaminant levels at the tap.

BOARD NOTE: Subsection (e) derived from 40 CFR 142.62(h)~~ (2016)~~.

f) Relief from the Maximum Contaminant Levels ~~maximum contaminant levels~~ for Radionuclides ~~radionuclides.~~

1) Relief from the Maximum Contaminant Levels ~~maximum contaminant levels~~ for Combined Radium-226 ~~combined radium-226~~ and Radium-228, Uranium, Gross Alpha Particle Activity (Excluding Radon ~~radium-228, uranium, gross alpha particle activity (excluding radon~~ and uranium), and Beta Particle ~~beta particle~~ and Photon Radioactivity ~~photon radioactivity.~~

A) Section 611.330(g) sets forth what USEPA has identified as the best available technology (BAT), treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the radionuclides listed in Section 611.330(b), (c), (d), and (e), for the purposes of issuing relief equivalent to a federal section 1415 variance or a section 1416 exemption.

B) In addition to the technologies listed in Section 611.330(g), Section 611.330(h) sets forth what USEPA has identified as the BAT, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the radionuclides listed in Section 611.330(b), (c), (d), and (e), for the purposes of issuing relief equivalent to a federal section 1415 variance or a section 1416 exemption to small drinking water systems, defined here as those serving 10,000 persons or fewer, as shown in the second table set forth at Section 611.330(h).

2) The Board will require a CWS supplier to install and use any treatment technology identified in Section 611.330(g), or in the case of small water systems (those serving 10,000 persons or fewer), listed in Section 611.330(h), as a condition for granting relief equivalent to a federal section 1415 variance or a section 1416 exemption, except as provided in subsection (f)(3). If, after the system's installation of the treatment technology, the system cannot meet the MCL, that system will be eligible for relief.

3) If a CWS supplier can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment technologies identified in this Section would only achieve a de minimus reduction in the contaminant level, the Board may issue a schedule of compliance that requires the system being granted relief equivalent to a federal section 1415 variance or a section 1416 exemption to examine other treatment technologies as a condition of obtaining the relief.

4) If the Agency determines that a treatment technology identified under subsection (f)(3) is technically feasible, it may request that the Board require the supplier to install and use that treatment technology in connection with a compliance schedule issued under ~~pursuant to~~ Section 36 of the Act. The Agency's determination must be based upon studies by the system and other relevant information.

5) The Board may require a CWS to use bottled water, point-of-use devices, point-of-entry devices, or other means as a condition of granting relief equivalent to a federal section 1415 variance or a section 1416 exemption from the requirements of Section 611.330, to avoid an unreasonable risk to health.

6) A CWS supplier that uses bottled water as a condition for receiving relief equivalent to a federal section 1415 variance or a section 1416 exemption from the requirements of Section 611.330 must meet the requirements specified in subsection (d)(6) and either subsections (d)(1) through (d)(3) or (d)(4) and (d)(5).

7) A CWS supplier that uses point-of-use or point-of-entry devices as a condition for obtaining relief equivalent to a federal section 1415 variance or a section 1416 exemption from the radionuclides NPDWRs must meet the conditions in subsections (e)(1) through (e)(6).

BOARD NOTE: Subsection (f) derived from 40 CFR 142.65~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.131 Relief Equivalent to SDWA Section 1415(e) Small System Variance

This Section is intended as a State equivalent of section 1415(e) of the federal SDWA (42 USC 300g-4(e)).

a) Variances may be obtained from the requirement to comply with an MCL or treatment technique to a PWS serving fewer than 10,000 persons in this Section. The PWS must file a variance petition under ~~pursuant to~~ Subpart B of 35 Ill. Adm. Code 104, except as modified or supplemented by this Section.

b) The Board will grant a small system variance to a PWS serving fewer than 3,300 persons. The Board will grant a small system variance to a PWS serving more than 3,300 persons but fewer than 10,000 persons with the approval of the USEPA. In determining the number of persons served by the PWS, the Board will include persons served by consecutive systems. A small system variance granted to a PWS also applies to any consecutive system served by it.

c) Availability of a Variance ~~variance.~~

1) A small system variance is not available under this Section for an NPDWR for a microbial contaminant (including a bacterium, virus, or other organism) or an indicator or treatment technique for a microbial contaminant.

2) A small system variance under this Section is available for compliance with a requirement specifying an MCL or treatment technique for a contaminant with respect to which the following is true:

A) An NPDWR was promulgated on or after January 1, 1986; and

B) The USEPA has published a small system variance technology under ~~pursuant to~~ section 1412(b)(15) of the federal SDWA (42 USC 300g-1(b)(15)).

BOARD NOTE: Small system variances are not available for PWSs above the pre-1986 MCL even if subsequently revised. If the USEPA revises a pre-1986 MCL and makes it more stringent, then a variance would be available for that contaminant, but only up to the pre-1986 maximum contaminant level.

d) No small system variance will be in effect until the later of the following:

1) 90 days after the Board proposes to grant the small system variance;

2) If the Board is proposing to grant a small system variance to a PWS serving fewer than 3,300 persons and the USEPA objects to the small system variance, the date on which the Board makes the recommended modifications or responds in writing to each objection; or

3) If the Board is proposing to grant a small system variance to a PWS serving a population of more than 3,300 and fewer than 10,000 persons, the date the USEPA approves the small system variance.

e) As part of the showing of arbitrary or unreasonable hardship, the PWS must prove and document the following to the Board:

1) That the PWS is eligible for a small system variance under ~~pursuant to~~ subsection (c);

2) That the PWS cannot afford to comply with the NPDWR for which a small system variance is sought, including by the following:

A) Treatment;

B) Alternative sources of water supply;

C) Restructuring or consolidation changes, including ownership change or physical consolidation with another PWS; or

D) Obtaining financial assistance under ~~pursuant to~~ section 1452 of the federal SDWA or any other federal or State program;

3) That the PWS meets the source water quality requirements for installing the small system variance technology developed under ~~pursuant to~~ guidance published under section 1412(b)(15) of the federal SDWA (42 USC 300g-1(b)(15));

4) That the PWS is financially and technically capable of installing, operating, and maintaining the applicable small system variance technology; and

5) That the terms and conditions of the small system variance ensure adequate protection of human health, considering the following:

A) The quality of the source water for the PWS; and

B) Removal efficiencies and expected useful life of the small system variance technology.

f) Terms and Conditions~~.~~

1) The Board will set the terms and conditions of a small system variance issued under this Section and will include, at a minimum, the following requirements:

   A) Proper and effective installation, operation, and maintenance of the applicable small system variance technology in accordance with guidance published by the USEPA, taking into consideration any relevant source water characteristics and any other site-specific conditions that may affect proper and effective operation and maintenance of the technology;

   B) Monitoring requirements for the contaminant for which a small system variance is sought; and

   C) Any other terms or conditions that are necessary to ensure adequate protection of public health, which may include the following:

      i) Public education requirements; and

      ii) Source water protection requirements.

2) The Board will establish a schedule for the PWS to comply with the terms and conditions of the small system variance that will include, at a minimum, the following requirements:

   A) Increments of progress, such as milestone dates for the PWS to apply for financial assistance and begin capital improvements;

   B) Quarterly reporting to the Agency of the PWSs compliance with the terms and conditions of the small system variance;

   C) Schedule for the Board to review the small system variance; and

   BOARD NOTE: Corresponding 40 CFR 142.307(d)~~ (2016)~~ provides that the states must review variances no less frequently than every five years. Section 36 of the Act provides that five ~~5~~ years is the maximum term of a variance.

   D) Compliance with the terms and conditions of the small system variance as soon as practicable, but not later than three years after the date on which the small system variance is granted. The Board may allow up to two additional years if the Board determines that additional time is necessary for the PWS to do the following:

      i) Complete necessary capital improvements to comply with the small system variance technology, secure an alternative source of water, or restructure or consolidate; or

ii) Obtain financial assistance provided under ~~pursuant to~~ section 1452 of the SDWA or any other federal or State program.

g) The Board will provide notice and opportunity for a public hearing as provided in Subpart B of 35 Ill. Adm. Code 104, except as modified or supplemented by this Section.

1) At least 30 days before the public hearing to discuss the proposed small system variance, the PWS must provide notice to all persons served by the PWS. For billed customers, this notice must include the information listed in subsection (g)(2). For other persons regularly served by the PWS, notice must provide sufficient information to alert readers to the proposed variance and direct them to where to receive additional information, and must be as provided in subsection (g)(1)(B). Notice must be by the following means:

A) Direct mail or other home delivery to billed customers or other service connections; and

B) Any other method reasonably calculated to notify, in a brief and concise manner, other persons regularly served by the PWS. Such methods may include publication in a local newspaper, posting in public places or delivery to community organizations.

2) The notice in subsection (g)(1)(A) must include, at a minimum, the following:

A) Identification of the contaminants for which a small system variance is sought;

B) A brief statement of the health effects associated with the contaminants for which a small system variance is sought, using language in Appendix H;

C) The address and telephone number at which interested persons may obtain further information concerning the contaminant and the small system variance;

D) A brief summary, in easily understandable terms, of the terms and conditions of the small system variance;

E) A description of the consumer petition process under subsection (h) and information on contacting the USEPA Regional Office;

F) A brief statement announcing the public meeting required under subsection (g)(3), including a statement of the purpose of the meeting, information regarding the time and location for the meeting, and the address and telephone number at which interested persons may obtain further information concerning the meeting; and

G) In communities with a large proportion of non-English-speaking residents, as determined by the Board, information in the appropriate language regarding the content and importance of the notice.

3) The Board will provide for at least one public hearing on the small system variance. The PWS must provide notice in the manner required under subsection (g)(1) at least 30 days prior to the public hearing.

4) Prior to promulgating the final variance, the Board will respond in writing to all significant public comments received relating to the small system variance. Response to public comment and any other documentation supporting the issuance of a variance will be made available to the public after final promulgation.

h) Any person served by the PWS may petition the USEPA to object to the granting of a small system variance within 30 days after the Board proposes to grant a small system variance for the PWS.

i) The Agency must promptly send the USEPA the Opinion and Order of the Board granting the proposed small system variance. The Board will make the recommended modifications, respond in writing to each objection, or withdraw the proposal to grant the small system variance if USEPA notifies the Board of a finding under ~~pursuant to~~ section 1415 of the SDWA (42 USC 300g-4).

j) In addition to the requirements of this Section, the provisions of Section 611.111, 611.112, or 611.130 may apply to relief granted under ~~pursuant to~~ this Section.

BOARD NOTE: Derived from 40 CFR 142, Subpart K ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART B: FILTRATION AND DISINFECTION

Section 611.211 Filtration Required

The Agency must determine that filtration is required unless the PWS meets the following criteria:

a) Source Water Quality Criteria ~~water quality criteria:~~

1) Coliforms, see Section 611.231(a)

2) Turbidity, see Section 611.231(b)

b) Site-Specific Criteria~~Site-specific criteria:~~

1) Disinfection, see Section 611.241(b)

2) Watershed control, see Section 611.232(b)

3) On-site inspection, see Section 611.232(c)

4) Absence of waterborne disease outbreaks, see Section 611.232(d)

5) Total coliform MCL, see Sections 611.232(e) and 611.325

BOARD NOTE: Derived from 40 CFR 141.71 ~~(2003)~~ and from the preamble discussion at 54 Fed. Reg. 27505 (June 29, 1989).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.212 Groundwater under Direct Influence of Surface Water

The Agency shall, under ~~pursuant to~~ Section 611.201, require all CWSs to demonstrate whether they are using "groundwater under the direct influence of surface water". The Agency must determine with information provided by the supplier whether a PWS uses "groundwater under the direct influence of surface water" on an individual basis. The Agency must determine that a groundwater source is under the direct influence of surface water based upon the following:

a) Physical Characteristics ~~characteristics~~ of the Source. ~~source:~~ whether the source is obviously a surface water source, such as a lake or stream. Other sources that may be subject to influence from surface waters include: springs, infiltration galleries, wells, or other collectors in subsurface aquifers.

b) Well Construction Characteristics ~~construction characteristics~~ and Geology ~~geology~~ with Field Evaluation ~~field evaluation.~~

1) The Agency may use the wellhead protection program's requirements, which include delineation of wellhead protection areas, assessment of sources of contamination and implementation of management control systems, to determine if the wellhead is under the influence of surface water.

2) Wells less than or equal to 50 feet in depth are likely to be under the influence of surface water.

3) Wells greater than 50 feet in depth are likely to be under the influence of surface water, unless they include the following:

A) A surface sanitary seal using bentonite clay, concrete, or similar material;

B) A well casing that penetrates consolidated (slowly permeable) material; and

C) A well casing that is only perforated or screened below consolidated (slowly permeable) material.

4) A source that is less than 200 feet from any surface water is likely to be under the influence of surface water.

c) Any structural modifications to prevent the direct influence of surface water and eliminate the potential for Giardia lamblia cyst contamination.

d) Source Water Quality Records~~ water quality records~~. The following are indicative that a source is under the influence of surface water:

1) A record of total coliform or fecal coliform contamination in untreated samples collected over the past three years;

2) A history of turbidity problems associated with the source; or

3) A history of known or suspected outbreaks of Giardia lamblia, Cryptosporidium or other pathogenic organisms associated with surface water that has been attributed to that source.

e) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH.

1) A variation in turbidity of 0.5 NTU or more over one year is indicative of surface influence.

2) A variation in temperature of nine Fahrenheit degrees or more over one year is indicative of surface influence.

f) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH that closely correlate to climatological or surface water conditions are indicative of surface water influence.

1) Evidence of particulate matter associated with the surface water; or

2) Turbidity or temperature data that correlates to that of a nearby surface water source.

g) Particulate Analysis.~~ analysis:~~ Significant occurrence of insects or other macroorganisms, algae, or large diameter pathogens such as Giardia lamblia is indicative of surface influence.

1) “Large diameter” particulates are those over seven micrometers.

2) Particulates must be measured as specified in the ~~“~~Guidance Manual for ~~Compliance with the ~~Filtration and Disinfection (91)~~ Requirements for~~

~~Public Water Systems using Surface Water Sources”~~, incorporated by reference in Section 611.102.

h) The potential for contamination by small-diameter pathogens, such as bacteria or viruses, does not alone render the source “under the direct influence of surface water”.

BOARD NOTE: Derived from the definition of “groundwater under the direct influence of surface water” in 40 CFR 141.2 ~~(2016)~~; from the Preamble at 54 Fed. Reg. 27489 (June 29, 1989); and from the USEPA ~~“~~Guidance Manual for ~~Compliance with the~~ Filtration and Disinfection (91) ~~Requirements for Public Water Systems using Surface Water Sources”, incorporated by reference in Section 611.102~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.220 General Requirements

a) The requirements of this Subpart B constitute NPDWRs. This Subpart B establishes criteria under which filtration is required as a treatment technique for PWSs supplied by a surface water source and PWSs supplied by a groundwater source under the direct influence of surface water. In addition, these regulations establish treatment technique requirements in lieu of MCLs for the following contaminants: Giardia lamblia, viruses, HPC bacteria, Legionella, and turbidity. Each supplier with a surface water source or a groundwater source under the direct influence of surface water must provide treatment of that source water that complies with these treatment technique requirements. The treatment technique requirements consist of installing and properly operating water treatment processes that reliably achieve the following:

1) At least 99.9 percent (3-log) removal or inactivation of Giardia lamblia cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and

2) At least 99.99 percent (4-log) removal or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

b) A supplier using a surface water source or a groundwater source under the direct influence of surface water is considered to be in compliance with the requirements of subsection (a) if either of the following is true:

1) The supplier meets the requirements for avoiding filtration in Sections 611.230 through 611.232 and the disinfection requirements in Section 611.241; or

2) The supplier meets the filtration requirements in Section 611.250 and the disinfection requirements in Section 611.242.

c) Each supplier using a surface water source or a groundwater source under the direct influence of surface water must have a certified operator under ~~pursuant to~~ 35 Ill. Adm. Code 603.103 and the Public Water Supply Operations Act [415 ILCS 45].

d) Additional Requirements ~~requirements~~ for PWSs Serving ~~serving~~ 10,000 or More Persons ~~more persons~~. In addition to complying with requirements in this Subpart B, PWSs serving 10,000 or more persons must also comply with the requirements in Subpart R ~~of this Part~~.

e) Additional Requirements ~~requirements~~ for Systems Serving Fewer Than ~~systems serving fewer than~~ 10,000 People ~~people~~. In addition to complying with requirements in this Subpart B, systems serving fewer than 10,000 people must also comply with the requirements in Subpart X ~~of this Part~~.

BOARD NOTE: Derived from 40 CFR 141.70 ~~(2002)~~. The Public Water Supply Operations Act ~~[415 ILCS 45]~~ applies only to CWSs, which are regulated by the Agency. It does not apply to non-CWSs, which are regulated by Public Health. Public Health has its own requirements for personnel operating water supplies that it regulates, e.g., 77 Ill. Adm. Code 900.40(e).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.232 Site-Specific Conditions

The Agency must consider the following site specific criteria in determining whether to require filtration under ~~pursuant to~~ Section 611.211:

a) Disinfection~~.~~

1) The supplier must meet the requirements of Section 611.241(a) at least 11 of the 12 previous months that the system served water to the public, on an ongoing basis, unless the system fails to meet the requirements during two ~~2~~ of the 12 previous months that the system served water to the public, and the Agency determines that at least one of these failures was caused by circumstances that were unusual and unpredictable.

2) The supplier must meet the following requirements at the times specified for each:

A) The requirements of Section 611.241(b)(1) at all times the system serves water to the public; and

B) The requirements of Section 611.241(b)(2) at all times the system serves water to the public, unless the Agency determines that any such failure was caused by circumstances that were unusual and unpredictable.

3) The supplier must meet the requirements of Section 611.241(c) at all times the system serves water to the public, unless the Agency determines that any such failure was caused by circumstances that were unusual and unpredictable.

4) The supplier must meet the requirements of Section 611.241(d) on an ongoing basis, unless the Agency determines that failure to meet these requirements was not caused by a deficiency in treatment of the source water.

b) Watershed Control Program ~~control program~~. The supplier must maintain a watershed control program that minimizes the potential for contamination by Giardia lamblia cysts and viruses in the source water.

1) The Agency must determine whether the watershed control program is adequate to meet this goal. The Agency must determine the adequacy of a watershed control program based on the following:

A) The comprehensiveness of the watershed review;

B) The effectiveness of the supplier's program to monitor and control detrimental activities occurring in the watershed; and

C) The extent to which the water supplier has maximized land ownership or controlled the land use within the watershed. At a minimum, the watershed control program must do the following:

i) Characterize the watershed hydrology and land ownership;

ii) Identify watershed characteristics and activities that may have an adverse effect on source water quality; and

iii) Monitor the occurrence of activities that may have an adverse effect on source water quality.

2) The supplier must demonstrate through ownership or written agreements with landowners within the watershed that it can control all human activities that may have an adverse impact on the microbiological quality of the source water. The supplier must submit an annual report to the Agency that identifies any special concerns about the watershed and how they are being handled; describes activities in the watershed that affect water quality; and projects what adverse activities are expected to occur in the future and describes how the supplier expects to address them. For systems using a groundwater source under the direct influence of surface water, an approved wellhead protection program may be used, if appropriate, to meet these requirements.

c) On-Site Inspection~~On-site inspection~~. The supplier must be subject to an annual on-site inspection to assess the watershed control program and disinfection treatment process. The Agency must conduct the inspection. A report of the on-site inspection summarizing all findings must be prepared every year. The on-site inspection must demonstrate that the watershed control program and disinfection treatment process are adequately designed and maintained. The on-site inspection must include the following:

1) A review of the effectiveness of the watershed control program;

2) A review of the physical condition of the source intake and how well it is protected;

3) A review of the supplier's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

4) An inspection of the disinfection equipment for physical deterioration;

5) A review of operating procedures;

6) A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

7) Identification of any improvements that are needed in the equipment, system maintenance, and operation or data collection.

d) Absence of Waterborne Disease Outbreaks ~~waterborne disease outbreaks~~. The PWS must not have been identified as a source of a waterborne disease outbreak, or if it has been so identified, the system must have been modified sufficiently to prevent another such occurrence.

e) Total Coliform ~~coliform~~ MCL. The supplier must comply with the MCL for total coliforms in Section 611.325(a) and (b) and the MCL for E. coli in Section 611.325(c) at least 11 months of the 12 previous months that the system served water to the public, on an ongoing basis, unless the Agency determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

f) TTHM. The supplier must comply with the requirements for total trihalomethanes, haloacetic acids (five), bromate, chlorite, chlorine, chloramines, and chlorine dioxide in Subpart I ~~of this Part~~.

BOARD NOTE: Derived from 40 CFR 141.71(b) ~~(2013)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.241 Unfiltered PWSs

Each supplier that does not provide filtration treatment must provide disinfection treatment as follows:

a) The disinfection treatment must be sufficient to ensure at least 99.9 percent (3-log) inactivation of Giardia lamblia cysts and 99.99 percent (4-log) inactivation of viruses, every day the system serves water to the public, except any one day each month. Each day a system serves water to the public, the supplier must calculate the $CT_{99.9}$ value from the system's treatment parameters using the procedure specified in Section 611.532(c) and determine whether this value is sufficient to achieve the specified inactivation rates for Giardia lamblia cysts and viruses.

1) If a system uses a disinfectant other than chlorine, the system may demonstrate to the Agency, through the use of an Agency-approved protocol for on-site disinfection challenge studies or other information, that $CT_{99.9}$ values other than those specified in Appendix B~~ of this Part~~, Tables 2.1 and 3.1 or other operational parameters are adequate to demonstrate that the system is achieving minimum inactivation rates required by this subsection.

2) The demonstration must be made by way of a SEP application.

b) The disinfection system must have either of the following:

1) Redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system; or

2) Automatic shut-off of delivery of water to the distribution system whenever there is less than 0.2 mg/ℓ of RDC in the water. If the Agency determines, by a SEP, that automatic shut-off would cause unreasonable risk to health or interfere with fire protection, the system must comply with subsection (b)(1).

c) The RDC in the water entering the distribution system, measured as specified in Sections 611.531(b) and 611.532(e), cannot be less than 0.2 mg/ℓ for more than four ~~4~~ hours.

d) RDC in the Distribution System~~ distribution system.~~

1) The RDC in the distribution system, measured as total chlorine, combined chlorine or chlorine dioxide, as specified in Sections 611.531(b) and 611.532(f), cannot be undetectable in more than 5 percent of the samples each month for any two consecutive months that the system serves water to the public. Water in the distribution system with HPC less than or equal to 500/ml, measured as specified in Section 611.531(a), is deemed to

have a detectable RDC for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 percent in one month, for any two consecutive months.

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

where the terms mean the following:

a = Number of instances where the RDC is measured;

b = Number of instances where the RDC is not measured, but HPC is measured;

c = Number of instances where the RDC is measured but not detected and no HPC is measured;

d = Number of instances where the RDC is measured but not detected, and where the HPC is greater than 500/ml; and

e = Number of instances where the RDC is not measured and HPC is greater than 500/ml.

2) Subsection (d)(1) does not apply if the Agency determines, under Section 611.213, that a supplier has no means for having a sample analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Section 611.531(a) and that the supplier is providing adequate disinfection in the distribution system.

BOARD NOTE: Derived from 40 CFR 141.72(a) ~~(2003)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.242 Filtered PWSs

Each supplier that provides filtration treatment must provide disinfection treatment as follows:

a) The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation or removal of Giardia lamblia cysts and at least 99.99 percent (4-log) inactivation or removal of viruses.

b) The RDC in the water entering the distribution system, measured as specified in Section 611.531(b) and 611.533(b), cannot be less than 0.2 mg/ℓ for more than four ~~4~~ hours.

c) RDC in the Distribution System ~~distribution system.~~

1) The RDC in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in Section 611.531(b) and 611.533(c), cannot be undetectable in more than 5 percent of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with HPC less than or equal to 500/ml, measured as specified in Section 611.531(a), is deemed to have a detectable RDC for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 percent in one month, for any two consecutive months.

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

where the terms mean the following:

a = Number of instances where the RDC is measured;

b = Number of instances where the RDC is not measured, but HPC is measured;

c = Number of instances where the RDC is measured but not detected and no HPC is measured;

d = Number of instances where the RDC is measured but not detected, and where HPC is greater than 500/ml; and

e = Number of instances where the RDC is not measured and HPC is greater than 500/ml.

2) Subsection (c)(1) does not apply if the Agency determines, under ~~pursuant to~~ Section 611.213, that a supplier has no means for having a sample analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Section 611.531(a) and that the supplier is providing adequate disinfection in the distribution system.

BOARD NOTE: Derived from 40 CFR 141.72(b) ~~(2003)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.250 Filtration

A supplier that uses a surface water source or a groundwater source under the direct influence of surface water, and does not meet all of the criteria in Sections 611.231 and 611.232 for avoiding filtration, must provide treatment consisting of both disinfection, as specified in Section 611.242, and filtration treatment that complies with the requirements of subsection (a), (b), (c), (d), or (e) within 18 months after the failure to meet any one of the criteria for avoiding filtration in Sections 611.231 and 611.232. Failure to meet any requirement after the date specified in this introductory paragraph is a treatment technique violation.

a) Conventional Filtration Treatment ~~filtration treatment~~ or Direct Filtration ~~direct filtration.~~

1) For a system using conventional filtration or direct filtration, the turbidity level of representative samples of the system's filtered water must be less than or equal to 0.5 NTU in at least 95 percent of the measurements taken each month, measured as specified in Section 611.531(a) and 611.533(a), except that if the Agency determines, by a SEP, that the system is capable of achieving at least 99.9 percent removal or inactivation of Giardia lamblia cysts at some turbidity level higher than 0.5 NTU in at least 95 percent of the measurements taken each month, the Agency must substitute this higher turbidity limit for that system. However, in no case may the Agency approve a turbidity limit that allows more than 1 NTU in more than five percent of the samples taken each month, measured as specified in Section 611.531(a) and 611.533(a).

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

3) A supplier serving at least 10,000 or more persons must meet the turbidity requirements of Section 611.743(a).

4) A supplier that serves fewer than 10,000 people must meet the turbidity requirements in Section 611.955.

b) Slow Sand Filtration ~~sand filtration.~~

1) For a system using slow sand filtration, the turbidity level of representative samples of the system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, measured as specified in Section 611.531(a) and 611.533(a), except that if the Agency determines, by a SEP, that there is no significant interference with disinfection at a higher level, the Agency must substitute the higher turbidity limit for that system.

2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU, measured as specified in Section 611.531(a) and 611.533(a).

c) Diatomaceous Earth Filtration ~~earth filtration.~~

1) For a system using diatomaceous earth filtration, the turbidity level of representative samples of the system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, measured as specified in Section 611.531(a) and 611.533(a).

2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU, measured as specified in Section 611.531(a) and 611.533(a).

d) Other Filtration Technologies ~~filtration technologies~~. A supplier may use a filtration technology not listed in subsections (a) through (c) if it demonstrates, by a SEP application, to the Agency, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of Section 611.242, consistently achieves 99.9 percent removal or inactivation of Giardia lamblia cysts and 99.99 percent removal or inactivation of viruses. For a supplier that makes this demonstration, the requirements of subsection (b) apply. A supplier serving 10,000 or more persons must meet the requirements for other filtration technologies in Section 611.743(b). A supplier that serves fewer than 10,000 people must meet the requirements for other filtration technologies in Section 611.955.

BOARD NOTE: Derived from 40 CFR 141.73 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.261 Unfiltered PWSs: Reporting and Recordkeeping

A supplier that uses a surface water source and does not provide filtration treatment must report monthly to the Agency the information specified in this Section, unless the Agency has determined that filtration is required, in which case the Agency must, by a SEP, specify alternative reporting requirements, as appropriate, until filtration is in place. A supplier that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment must report monthly to the Agency the information specified in this Section six months after the Agency determines that the groundwater source is under the direct influence of surface water, unless the Agency has determined that filtration is required, in which case the Agency must, by a SEP, specify alternative reporting requirements, as appropriate, until filtration is in place.

a) Source water quality information must be reported to the Agency within ten days after the end of each month the system serves water to the public. Information that must be reported includes the following:

1) The cumulative number of months for which results are reported.

2) The number of fecal or total coliform samples, whichever are analyzed during the month (if a system monitors for both, only fecal coliforms must be reported), the dates of sample collection, and the dates when the turbidity level exceeded 1 NTU.

3) The number of samples during the month that had equal to or fewer than 20/100 ml fecal coliforms or equal to or fewer than 100/100 ml total coliforms, whichever are analyzed.

4) The cumulative number of fecal or total coliform samples, whichever are analyzed, during the previous six months the system served water to the public.

5) The cumulative number of samples that had equal to or fewer than 20/100 ml fecal coliforms or equal to or fewer than 100/100 ml total coliforms, whichever are analyzed, during the previous six months the system served water to the public.

6) The percentage of samples that had equal to or fewer than 20/100 ml fecal coliforms or equal to or fewer than 100/100 ml total coliforms, whichever are analyzed, during the previous six months the system served water to the public.

7) The maximum turbidity level measured during the month, the dates of occurrence for any measurements that exceeded 5 NTU and the dates the occurrences were reported to the Agency.

8) For the first 12 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after one year of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 12 months the system served water to the public.

9) For the first 120 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after ten years of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 120 months the system served water to the public.

b) Disinfection information specified in Section 611.532 must be reported to the Agency within ten days after the end of each month the system serves water to the public. Information that must be reported includes the following:

1) For each day, the lowest measurement of RDC in mg/ℓ in water entering the distribution system.

2) The date and duration of each period when the RDC in water entering the distribution system fell below 0.2 mg/ℓ and when the Agency was notified of the occurrence.

3) The daily RDCs (in mg/ℓ) and disinfectant contact times (in minutes) used for calculating the CT values.

4) If chlorine is used, the daily measurements of pH of disinfected water following each point of chlorine disinfection.

5) The daily measurements of water temperature in degrees C following each point of disinfection.

6) The daily CTcalc and Ai values for each disinfectant measurement or sequence and the sum of all Ai values (B) before or at the first customer.

7) The daily determination of whether disinfection achieves adequate Giardia cyst and virus inactivation, i.e., whether Ai is at least 1.0 or, where disinfectants other than chlorine are used, other indicator conditions that the Agency, under Section 611.241(a)(1), determines are appropriate, are met.

8) The following information on the samples taken in the distribution system in conjunction with total coliform monitoring under ~~pursuant to~~ Section 611.240 through 611.242:

   A) Number of instances where the RDC is measured;

   B) Number of instances where the RDC is not measured but HPC is measured;

   C) Number of instances where the RDC is measured but not detected and no HPC is measured;

   D) Number of instances where no RDC is detected and where HPC is greater than 500/ml;

   E) Number of instances where the RDC is not measured and HPC is greater than 500/ml;

   F) For the current and previous month the system served water to the public, the value of "V" in the following formula:

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

   where the terms mean the following:

   a = Value in subsection (b)(8)(A);
   b = Value in subsection (b)(8)(B);
   c = Value in subsection (b)(8)(C);
   d = Value in subsection (b)(8)(D); and
   e = Value in subsection (b)(8)(E).

   G) The requirements of subsections (b)(8)(A) through (b)(8)(F) do not apply if the Agency determines, under Section 611.213, that a system has no means for having a sample analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Section 611.531(a) and that the supplier is providing adequate disinfection in the distribution system.

9) A system need not report the data listed in subsections (b)(1) and (b)(3) through (b)(6), if all data listed in subsections (b)(1) through (b)(8) remain on file at the system, and the Agency determines, by a SEP, that the following is true:

A) The system has submitted to the Agency all the information required by subsections (b)(1) through (b)(8) for at least 12 months; and

B) The Agency has determined that the system is not required to provide filtration treatment.

c) By October 10 of each year, each system must provide to the Agency a report that summarizes its compliance with all watershed control program requirements specified in Section 611.232(b).

d) By October 10 of each year, each system must provide to the Agency a report on the on-site inspection conducted during that year under Section 611.232(c), unless the on-site inspection was conducted by the Agency. If the inspection was conducted by the Agency, the Agency must provide a copy of its report to the supplier.

e) Reporting Health Threats ~~health threats.~~

1) Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, must report that occurrence to the Agency as soon as possible, but no later than by the end of the next business day.

2) If at any time the turbidity exceeds 5 NTU, the system must consult with the Agency as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under Section 611.903(b)(3).

3) If at any time the RDC falls below 0.2 mg/ℓ in the water entering the distribution system, the system must notify the Agency as soon as possible, but no later than by the end of the next business day. The system also must notify the Agency by the end of the next business day whether or not the RDC was restored to at least 0.2 mg/ℓ within four hours.

BOARD NOTE: Derived from 40 CFR 141.75(a) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.262 Filtered PWSs: Reporting and Recordkeeping

A supplier that uses a surface water source or a groundwater source under the direct influence of surface water and provides filtration treatment must report monthly to the Agency the information specified in this Section.

a) Turbidity measurements as required by Section 611.533(a) must be reported within ten days after the end of each month the supplier serves water to the public. Information that must be reported includes the following:

1) The total number of filtered water turbidity measurements taken during the month.

2) The number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits specified in Section 611.250 for the filtration technology being used.

3) The date and value of any turbidity measurements taken during the month that exceed 5 NTU.

b) Disinfection information specified in Section 611.533 must be reported to the Agency within ten days after the end of each month the supplier serves water to the public. Information that must be reported includes the following:

1) For each day, the lowest measurement of RDC in mg/ℓ in water entering the distribution system.

2) The date and duration of each period when the RDC in water entering the distribution system fell below 0.2 mg/ℓ and when the Agency was notified of the occurrence.

3) The following information on the samples taken in the distribution system in conjunction with total coliform monitoring under ~~pursuant to~~ Sections 611.240 through 611.242:

A) Number of instances where the RDC is measured;

B) Number of instances where the RDC is not measured but HPC is measured;

C) Number of instances where the RDC is measured but not detected and no HPC is measured;

D) Number of instances where no RDC is detected and where HPC is greater than 500/ml;

E) Number of instances where the RDC is not measured and HPC is greater than 500/ml;

F) For the current and previous month the supplier serves water to the public,the value of "V" in the following formula:

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

where the terms mean the following:

a = Value in subsection (b)(3)(A);
b = Value in subsection (b)(3)(B);
c = Value in subsection (b)(3)(C);
d = Value in subsection (b)(3)(D); and
e = Value in subsection (b)(3)(E).

G) Subsections (b)(3)(A) through (b)(3)(F) do not apply if the Agency determines, under ~~pursuant to~~ Section 611.213, that a supplier has no means for having a sample analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Section 611.531(a) and that the supplier is providing adequate disinfection in the distribution system.

c) Reporting Health Threats ~~health threats.~~

1) Each supplier, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, must report that occurrence to the Agency as soon as possible, but no later than by the end of the next business day.

2) If at any time the turbidity exceeds 5 NTU, the supplier must consult with the Agency as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under Section 611.903(b)(3).

3) If at any time the residual falls below 0.2 mg/ℓ in the water entering the distribution system, the supplier must notify the Agency as soon as possible, but no later than by the end of the next business day. The supplier also must notify the Agency by the end of the next business day whether or not the residual was restored to at least 0.2 mg/ℓ within four hours.

BOARD NOTE: Derived from 40 CFR 141.75(b) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.276 Recycle Provisions

a) Applicability. A Subpart B system supplier that employs conventional filtration or direct filtration treatment and which recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the requirements in subsections (b) through (d).

b) Reporting. A supplier must notify the Agency in writing if the supplier recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification must include, at a minimum, the information specified in subsections (b)(1) and (b)(2), as follows:

  1) A plant schematic showing the origin of all flows that are recycled (including, but not limited to, spent filter backwash water, thickener supernatant, and liquids from dewatering processes), the hydraulic conveyance used to transport them, and the location where they are re-introduced back into the treatment plant.

  2) Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and Agency-approved operating capacity for the plant where the Agency has made such a determination.

c) Treatment Technique Requirement ~~technique requirement~~. Any supplier that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must return these flows through the processes of the supplier's existing conventional or direct filtration system, as defined in Section 611.101, or at an alternative location approved by a permit issued by the Agency.

d) Recordkeeping. The supplier must collect and retain on file recycle flow information specified in subsections (d)(1) through (d)(6) for review and evaluation by the Agency, as follows:

  1) A copy of the recycle notification and information submitted to the State under subsection (b).

  2) A list of all recycle flows and the frequency with which they are returned.

  3) The average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

  4) The typical filter run length and a written summary of how filter run length is determined.

  5) The type of treatment provided for the recycle flow.

  6) Data on the physical dimensions of the equalization or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals

used and average dose and frequency of use, and frequency at which solids are removed, if applicable.

BOARD NOTE: Derived from 40 CFR 141.76 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART C: USE OF NON-CENTRALIZED TREATMENT DEVICES

Section 611.290 Use of Point-of-Use Devices or Bottled Water

a) Suppliers must not use bottled water to achieve compliance with an MCL.

b) Bottled water or point-of-use devices may be used on a temporary basis to avoid an unreasonable risk to health under ~~pursuant to~~ a SEP granted by the Agency.

c) Any use of bottled water must comply with the substantive requirements of Section 611.130(d), except that the supplier must submit its quality control plan for Agency review as part of its SEP request, rather than for Board review.

BOARD NOTE: Derived from 40 CFR 141.101 ~~(2003)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART F: MAXIMUM CONTAMINANT LEVELS (MCLs) AND
MAXIMUM RESIDUAL DISINFECTANT LEVELS (MRDLs)

Section 611.300 Old MCLs for Inorganic Chemical Contaminants

a) The old MCLs listed in subsection (b) for inorganic chemical contaminants (IOCs) are additional State requirements. The old MCLs apply only to CWS suppliers. Compliance with old MCLs for inorganic chemicals is calculated under Section 611.612.

BOARD NOTE: This ~~Formerly derived from 40 CFR 141.11(a), this~~ subsection (a) is ~~has become~~ an additional State requirement.

b) The following are the old MCLs for IOCs:

Contaminant	Level, mg/ℓ	~~Additional State Requirement (*)~~
Iron	1.0	~~*~~
Manganese	0.15	~~*~~
Zinc	5.	~~*~~

BOARD NOTE: This ~~Formerly derived from 40 CFR 141.11(a), this~~ subsection (b) is ~~has become~~ an additional State requirement.

c) This subsection corresponds with 40 CFR 141.11(c), marked as reserved by USEPA. This statement maintains structural parity with the federal rules.

d) Nitrate~~.~~

Non-CWSs may exceed the MCL for nitrate under the following circumstances:

1) The nitrate level must not exceed 20 mg/ℓ;

2) The water must not be available to children under six months of age;

3) The NCWS supplier is meeting the public notification requirements under Section 611.909, including continuous posting of the fact that the nitrate level exceeds 10 mg/ℓ together with the potential health effects of exposure;

4) The supplier will annually notify local public health authorities and the Department of Public Health of the nitrate levels that exceed 10 mg/ℓ; and

5) No adverse public health effects result.

BOARD NOTE: Derived from 40 CFR 141.11(d) ~~(2012)~~. The Department of Public Health regulations may impose a nitrate limitation requirement. Those regulations are at 77 Ill. Adm. Code 900.50.

e) The following supplementary condition applies to the MCLs listed in subsection (b) for iron and manganese:

1) CWS suppliers that serve a population of 1000 or fewer, or 300 service connections or fewer, are exempt from the standards for iron and manganese.

2) The Agency may, by a SEP, allow iron and manganese in excess of the MCL if sequestration tried on an experimental basis proves to be effective. If sequestration is not effective, positive iron or manganese reduction treatment as applicable must be provided. Experimental use of a sequestering agent may be tried only if approved by a SEP.

BOARD NOTE: This subsection (e) is an additional State requirement.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.311 Revised MCLs for Organic Chemical Contaminants

a) Volatile Organic Chemical Contaminants~~organic chemical contaminants~~. The following MCLs for volatile organic chemical contaminants (VOCs) apply to CWS suppliers and NTNCWS suppliers.

CAS No.	Contaminant	MCL (mg/ℓ)
71-43-2	Benzene	0.005
56-23-5	Carbon tetrachloride	0.005
95-50-1	o-Dichlorobenzene	0.6
106-46-7	p-Dichlorobenzene	0.075
107-06-2	1,2-Dichloroethane	0.005
75-35-4	1,1-Dichloroethylene	0.007
156-59-2	cis-1,2-Dichloroethylene	0.07
156-60-5	trans-1,2-Dichloroethylene	0.1
75-09-2	Dichloromethane (methylene chloride)	0.005
78-87-5	1,2-Dichloropropane	0.005
100-41-4	Ethylbenzene	0.7
108-90-7	Monochlorobenzene	0.1
100-42-5	Styrene	0.1
127-18-4	Tetrachloroethylene	0.005
108-88-3	Toluene	1
120-82-1	1,2,4-Trichlorobenzene	0.07
71-55-6	1,1,1-Trichloroethane	0.2
79-00-5	1,1,2-Trichloroethane	0.005
79-01-6	Trichloroethylene	0.005
75-01-4	Vinyl chloride	0.002
1330-20-7	Xylenes (total)	10

BOARD NOTE: See the definition of "initial compliance period" at Section 611.101.

b) USEPA has identified, as indicated below, granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) as BAT for achieving compliance with the MCLs for volatile organic chemical contaminants (VOCs) and synthetic organic chemical contaminants (SOCs) in subsections (a) and (c).

15972-60-8	Alachlor	GAC
116-06-3	Aldicarb*	GAC
1646-87-4	Aldicarb sulfone*	GAC
1646-87-3	Aldicarb sulfoxide*	GAC
1912-24-9	Atrazine	GAC
71-43-2	Benzene	GAC, PTA
50-32-8	Benzo(a)pyrene	GAC
1563-66-2	Carbofuran	GAC
56-23-5	Carbon tetrachloride	GAC, PTA

57-74-9	Chlordane	GAC
94-75-7	2,4-D	GAC
75-99-0	Dalapon	GAC
96-12-8	Dibromochloropropane	GAC, PTA
95-50-1	o-Dichlorobenzene	GAC, PTA
106-46-7	p-Dichlorobenzene	GAC, PTA
107-06-2	1,2-Dichloroethane	GAC, PTA
156-59-2	cis-1,2-Dichloroethylene	GAC, PTA
156-60-5	trans-1,2-Dichoroethylene	GAC, PTA
75-35-4	1,1-Dichloroethylene	GAC, PTA
75-09-2	Dichloromethane	PTA
78-87-5	1,2-Dichloropropane	GAC, PTA
103-23-1	Di(2-ethylhexyl)adipate	GAC, PTA
117-81-7	Di(2-ethylhexyl)phthalate	GAC
88-85-7	Dinoseb	GAC
85-00-7	Diquat	GAC
145-73-3	Endothall	GAC
72-20-8	Endrin	GAC
106-93-4	Ethylene dibromide (EDB)	GAC, PTA
100-41-4	Ethylbenzene	GAC, PTA
1071-53-6	Glyphosate	OX
76-44-8	Heptachlor	GAC
1024-57-3	Heptachlor epoxide	GAC
118-74-1	Hexachlorobenzene	GAC
77-47-3	Hexachlorocyclopentadiene	GAC, PTA
58-89-9	Lindane	GAC
72-43-5	Methoxychlor	GAC
108-90-7	Monochlorobenzene	GAC, PTA
23135-22-0	Oxamyl	GAC
87-86-5	Pentachlorophenol	GAC
1918-02-1	Picloram	GAC
1336-36-3	Polychlorinated biphenyls (PCB)	GAC
122-34-9	Simazine	GAC
100-42-5	Styrene	GAC, PTA
1746-01-6	2,3,7,8-TCDD	GAC
127-18-4	Tetrachloroethylene	GAC, PTA
108-88-3	Toluene	GAC
8001-35-2	Toxaphene	GAC
120-82-1	1,2,4-trichlorobenzene	GAC, PTA
71-55-6	1,1,1-Trichloroethane	GAC, PTA
79-00-5	1,1,2-trichloroethane	GAC, PTA
79-01-6	Trichloroethylene	GAC, PTA
93-72-1	2,4,5-TP	GAC
75-01-4	Vinyl chloride	PTA
1330-20-7	Xylene	GAC, PTA

* See the Board note appended to the end of this Section.

c) Synthetic Organic Chemical Contaminants ~~organic chemical contaminants~~. The following MCLs for SOCs apply to CWS and NTNCWS suppliers.

CAS Number	Contaminant	MCL (mg/ℓ)
15972-60-8	Alachlor	0.002
116-06-3	Aldicarb*	0.002
1646-87-4	Aldicarb sulfone*	0.002
1646-87-3	Aldicarb sulfoxide*	0.004
1912-24-9	Atrazine	0.003
50-32-8	Benzo(a)pyrene	0.0002
1563-66-2	Carbofuran	0.04
57-74-9	Chlordane	0.002
94-75-7	2,4-D	0.07
75-99-0	Dalapon	0.2
96-12-8	Dibromochloropropane	0.0002
103-23-1	Di(2-ethylhexyl)adipate	0.4
117-81-7	Di(2-ethylhexyl)phthalate	0.006
88-85-7	Dinoseb	0.007
85-00-7	Diquat	0.02
145-73-3	Endothall	0.1
72-20-8	Endrin	0.002
106-93-4	Ethylene dibromide	0.00005
1071-53-6	Glyphosate	0.7
76-44-8	Heptachlor	0.0004
1024-57-3	Heptachlor epoxide	0.0002
118-74-1	Hexachlorobenzene	0.001
77-47-4	Hexachlorocyclopentadiene	0.05
58-89-9	Lindane	0.0002
72-43-5	Methoxychlor	0.04
23135-22-0	Oxamyl (Vydate)	0.2
87-86-5	Pentachlorophenol	0.001
1918-02-1	Picloram	0.5
1336-36-3	Polychlorinated biphenyls (PCBs)	0.0005
122-34-9	Simazine	0.004
1746-01-6	2,3,7,8-TCDD (Dioxin)	0.00000003
8001-35-2	Toxaphene	0.003
93-72-1	2,4,5-TP	0.05

* See the Board note appended to the end of this Section.

BOARD NOTE: Derived from 40 CFR 141.61 ~~(2016)~~. See the definition of "initial compliance period" at Section 611.101. More stringent state MCLs for 2,4-D, heptachlor, and heptachlor epoxide appear at Section 611.310. See the Board Note at that provision. In 40 CFR 141.6(g), USEPA postponed the effectiveness of the MCLs for aldicarb, aldicarb sulfone, and aldicarb sulfoxide until it took further action on those MCLs. See 40 CFR 141.6(g) and 57 Fed. Reg. 22178 (May 27, 1992). USEPA has since stated that it anticipates taking no action until 2005 on a federal national primary drinking water regulation (NPDWR) applicable to the aldicarbs. 68 Fed. Reg. 31108 (May 27, 2003). In 2005, USEPA indicated no projected date for final action on the aldicarbs. *See* 70 Fed. Reg. 27501, 671 (May 16, 2005). An entry for the aldicarbs last appeared in USEPA's Spring 2007 semiannual regulatory agenda, indicating no projected dates for further action. *See* 72 Fed. Reg. 23156, 97 (Apr. 30, 2007); *see also* 72 Fed. Reg. 70118, 23 (Dec. 10, 2007) (the first USEPA regulatory agenda that included no entry for the aldicarbs). While the Board must maintain entries for aldicarb, aldicarb sulfoxide, and aldicarb sulfone to maintain consistency with the letter of the federal regulations (*see* Sections 7.2 and 17.5 of the Act; 42 USC 300g-2 (2016); 40 CFR 142.10 ~~(2016)~~), the Board intends that no aldicarb requirements apply in Illinois until after USEPA adopts such requirements, and the Board has removed this statement.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.312 Maximum Contaminant Levels (MCLs) for Disinfection Byproducts (DBPs)

a) Bromate and Chlorite ~~chlorite~~. The maximum contaminant levels (MCLs) for bromate and chlorite are as follows:

Disinfection Byproduct	MCL (mg/ℓ)
Bromate	0.010
Chlorite	1.0

1) Compliance dates for CWSs and NTNCWSs. A Subpart B system supplier that serves 10,000 or more persons must comply with this subsection (a). A Subpart B system supplier that serves fewer than 10,000 persons and systems using only groundwater not under the direct influence of surface water must comply with this subsection (a).

2) USEPA has identified the following as the best available technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for bromate and chlorite identified in this subsection (a):

Disinfection Byproduct	Best Available Technology
Bromate	Control of ozone treatment process to reduce production of bromate.
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

b) TTHM and HAA5~~.~~

~~1) Subpart I—Running annual average compliance.~~

~~A) Compliance dates. A Subpart B system supplier must comply with this subsection (b)(1). All systems must comply with these MCLs until the date specified for Subpart Y compliance in Section 611.980(c).~~

~~Disinfection Byproduct~~	~~MCL (mg/ℓ)~~
~~Total trihalomethanes (TTHM)~~	~~0.080~~
~~Haloacetic acids (five) (HAA5)~~	~~0.060~~

~~B) USEPA has identified the following as the best available technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this subsection (b)(1):~~

~~Disinfection Byproduct~~	~~Best Available Technology~~
~~Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)~~	~~Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant.~~

~~2) Subpart Y—Locational running annual average compliance.~~

1~~A~~) Compliance Dates ~~dates~~. The Subpart Y MCLs for TTHM and HAA5 must be complied with as a locational running annual average at each monitoring location as required ~~beginning the date specified for Subpart Y compliance~~ in Section 611.970(c) ~~611.980(c)~~.

Disinfection Byproduct	MCL (mg/ℓ)
Total trihalomethanes (TTHM)	0.080
Haloacetic acids (five) (HAA5)	0.060

2~~B~~) USEPA has identified the following as the best available technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this subsection (b)(2) for any supplier that disinfects its source water:

Disinfection Byproduct	Best Available Technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)	Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight

cutoff ≤1000 Daltons; or
GAC20.

3~~C~~) USEPA has identified the following as the best available technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this subsection (b)(2) for consecutive systems and applies only to the disinfected water that a consecutive system buys or otherwise receives from a wholesale system:

Disinfection Byproduct	Best Available Technology
Total trihalomethanes (TTHM) and Haloacetic acids (five) (HAA5)	Any system that serves 10,000 or more persons: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance; or Any system that serves fewer than 10,000 persons: Improved distribution system and storage tank management to reduce residence time.

BOARD NOTE: Derived from 40 CFR 141.64~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.313 Maximum Residual Disinfectant Levels (MRDLs)

a) Maximum residual disinfectant levels (MRDLs) are as follows:

Disinfectant residual	MRDL (mg/ℓ)
Chlorine	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)

b) Compliance Dates~~ dates.~~

1) CWSs and NTNCWSs. A Subpart B system supplier serving 10,000 or more persons must comply with this Section. A Subpart B system supplier serving fewer than 10,000 persons or a supplier using only groundwater not under the direct influence of surface water must comply with this Section.

2) Transient NCWSs. A Subpart B system supplier serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL. A Subpart B system supplier serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant or a supplier using only groundwater not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL.

c) The following are identified as the best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in subsection (a): control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels.

BOARD NOTE: Derived from 40 CFR 141.65 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.330 Maximum Contaminant Levels for Radionuclides

a) This subsection corresponds with 40 CFR 141.66(a), marked reserved by USEPA. This statement maintains structural consistency with USEPA rules.

b) MCL for Combined Radium-226 ~~combined radium-226~~ and –228. The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/ℓ. The combined radium-226 and radium-228 value is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228.

c) MCL for Gross Alpha Particle Activity ~~gross alpha particle activity~~ (excluding radon and uranium). The maximum contaminant level for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/ℓ.

d) MCL for Beta Particle ~~beta particle~~ and Photon Radioactivity ~~photon radioactivity.~~

1) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year (mrem/year).

2) Except for the radionuclides listed in the following table, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of two liters per day drinking water intake, using the 168-hour data list set forth in NBS Handbook 69 (63), incorporated by reference in Section 611.102. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ must not exceed 4 mrem/year.

Average Annual Concentrations Assumed to Produce a Total Body or Organ Dose of 4 mrem/yr

Radionuclide	Critical organ	pCi per liter
1. Tritium	Total body	20,000
2. Strontium-90	Bone Marrow	8

e) MCL for Uranium ~~uranium~~. The maximum contaminant level for uranium is 30 µg/ℓ.

f) Compliance Dates ~~dates~~ for Combined Radium-226 ~~combined radium-226~~ and -228, Gross Alpha Particle Activity, Gross Beta Particle ~~gross alpha particle activity, gross beta particle~~ and Photon Radioactivity, ~~photon radioactivity,~~ and Uranium ~~uranium:~~ A CWS supplier must comply with the MCLs listed in subsections (b) through (e), and compliance must be determined in accordance with the requirements of Subpart Q.

g) Best Available Technologies ~~available technologies~~ (BATs) for Radionuclides ~~radionuclides~~. USEPA has identified the technologies indicated in the following table as the BAT for achieving compliance with the MCLs for combined radium-226 and -228, uranium, gross alpha particle activity, and beta particle and photon radioactivity.

BAT for Combined Radium-226 and Radium-228, Uranium, Gross Alpha Particle Activity, and Beta Particle and Photon Radioactivity

Contaminant	BAT
1. Combined radium-226 and radium-228	Ion exchange, reverse osmosis, lime softening.
2. Uranium	Ion exchange, reverse osmosis, lime softening, coagulation/filtration.
3. Gross alpha particle activity (excluding Radon and Uranium)	Reverse osmosis.
4. Beta particle and photon radioactivity	Ion exchange, reverse osmosis.

h) Small Systems Compliance Technologies List ~~systems compliance technologies list~~ for Radionuclides ~~radionuclides.~~

List of Small Systems Compliance Technologies for Radionuclides and Limitations to Use

Unit technologies	Limitations (see footnotes)	Operator skill level required[1]	Raw water quality range and considerations[1]
1. Ion exchange (IE)	(a)	Intermediate	All ground waters.
2. Point of use (POU[2]) IE	(b)	Basic	All ground waters.
3. Reverse osmosis (RO)	(c)	Advanced	Surface waters usually require pre-filtration.
4. POU[2] RO	(b)	Basic	Surface waters usually require pre-filtration.
5. Lime softening	(d)	Advanced	All waters.
6. Green sand filtration	(e)	Basic	
7. Co-precipitation with Barium sulfate	(f)	Intermediate to Advanced	Ground waters with suitable water quality.
8. Electrodialysis/ electrodialysis reversal		Basic to Intermediate	All ground waters.
9. Pre-formed hydrous Manganese oxide filtration	(g)	Intermediate	All ground waters.
10. Activated alumina	(a), (h)	Advanced	All ground waters; competing anion concentrations may affect regeneration frequency.
11. Enhanced coagulation/ filtration	(i)	Advanced	Can treat a wide range of water qualities.

[1] National Research Council (NRC). "Safe Water from Every Tap: Improving Water Service to Small Communities", National Academy Press, Washington, D.C. 1997.

[2] A POU, or "point-of-use" technology is a treatment device installed at a single tap used for the purpose of reducing contaminants in drinking water at that one tap. POU devices are typically installed at the kitchen tap.
BOARD NOTE: USEPA refers the reader to the notice of data availability (NODA) at 66 Fed. Reg. 21576 (April 21, 2000) for more details.

Limitations Footnotes: Technologies for Radionuclides:

(a) The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.

(b) When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance.

(c) Reject water disposal options should be carefully considered before choosing this technology.

BOARD NOTE: In corresponding 40 CFR 141.66, Table C, footnote c states in part as follows: "See other RO limitations described in the SWTR Compliance Technologies Table." Table C was based in significant part on "Table 13.—Technologies for Radionuclides" that appears at 63 Fed. Reg. 42032, 42043 (Aug. 6, 1998). Table 13 refers to "Table 2.—SWTR Compliance Technology Table: Filtration". That Table 2, at 63 Fed. Reg. at 42036, lists the limitations on RO as follows:

> [d] Blending (combining treated water with untreated raw water) cannot be practiced at risk of increasing microbial concentrations in finished water.
> [e] Post-disinfection recommended as a safety measure and for residual maintenance.
> [f] Post-treatment corrosion control will be needed prior to distribution.

(d) The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small surface water systems.

(e) Removal efficiencies can vary depending on water quality.

(f) This technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.

(g) This technology is most applicable to small systems that already have filtration in place.

(h) Handling of chemicals required during regeneration and pH adjustment may be too difficult for small systems without an adequately trained operator.

(i) Assumes modification to a coagulation/filtration process already in place.

Compliance Technologies by System Size Category for Radionuclide NPDWRs

	Compliance Technologies[1] ~~technologies[1]~~ for System Size Categories (Population Served) ~~system size categories (population served)~~		
Contaminant	25-500	501-3,300	3,300-10,000
1. Combined radium-226 and radium-228	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7, 8, 9
2. Gross alpha particle activity	3, 4	3, 4	3, 4
3. Beta particle activity and photon activity	1, 2, 3, 4	1, 2, 3, 4	1, 2, 3, 4
4. Uranium	1, 2, 4, 10, 11	1, 2, 3, 4, 5, 10, 11	1, 2, 3, 4, 5, 10, 11

Note:

[1] Numbers correspond to those technologies found listed in the table, "List of Small Systems Compliance Technologies for Radionuclides and Limitations to Use", set forth above.

BOARD NOTE: Derived from 40 CFR 141.66 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART G: LEAD AND COPPER

Section 611.350 General Requirements

a) Applicability and Scope~~.~~

1) Applicability. The requirements of this Subpart G constitute national primary drinking water regulations for lead and copper. This Subpart G applies to all community water systems (CWSs) and non-transient, non-community water systems (NTNCWSs).

2) Scope. This Subpart G establishes a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

b) Definitions. For the purposes of only this Subpart G, the following terms have the following meanings:

"Action level" means that concentration of lead or copper in water computed under subsection (c) that determines, in some cases, the treatment requirements of this Subpart G that a supplier must complete. The action level for lead is 0.015 mg/ℓ. The action level for copper is 1.3 mg/ℓ.

"Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

"Effective corrosion inhibitor residual" means a concentration of inhibitor in the drinking water sufficient to form a passivating film on the interior walls of a pipe.

"Exceed", as this term is applied to either the lead or the copper action level, means that the 90th percentile level of the supplier's samples collected during a six-month monitoring period is greater than the action level for that contaminant.

"First draw sample" means a one-liter sample of tap water, collected in accordance with Section 611.356(b)(2), that has been standing in plumbing pipes for at least six hours and which is collected without flushing the tap.

"Large system" means a water system that regularly serves water to more than 50,000 persons.

"Lead service line" means a service line made of lead that connects the water main to the building inlet, including any lead pigtail, gooseneck, or other fitting that is connected to such lead line.

"Maximum permissible concentration" or "MPC" means that concentration of lead or copper for finished water entering the supplier's

distribution system, designated by the Agency by a SEP that reflects the contaminant removal capability of the treatment properly operated and maintained.
BOARD NOTE: Derived from 40 CFR 141.83(b)(4)~~ (2016)~~. (See Section 611.353(b)(4)(B).)

"Medium-sized system" means a water system that regularly serves water to more than 3,300 up to 50,000 or fewer persons.

"Meet", as this term is applied to either the lead or the copper action level, means that the 90th percentile level of the supplier's samples collected during a six-month monitoring period is less than or equal to the action level for that contaminant.

"Method detection limit" or "MDL" is as defined at Section 611.646(a). The MDL for lead is 0.001 mg/ℓ. The MDL for copper is 0.001 mg/ℓ, or 0.020 mg/ℓ by atomic absorption direct aspiration method.
BOARD NOTE: Derived from 40 CFR 141.89(a)(1)(iii)~~ (2016)~~.

"Monitoring period" means any of the six-month periods of time during which a supplier must complete a cycle of monitoring under this Subpart G.
BOARD NOTE: USEPA refers to these as "monitoring periods". The Board uses "six-month monitoring period" to avoid confusion with "compliance period", as used elsewhere in this Part and defined at Section 611.101.

"Multiple-family residence" means a building that is currently used as a multiple-family residence, but not one that is also a "single-family structure".

"90th percentile level" means that concentration of lead or copper contaminant exceeded by ten percent or fewer of all samples collected during a six-month monitoring period under Section 611.356 (i.e., that concentration of contaminant greater than or equal to the results obtained from 90 percent of the samples). The 90th percentile levels for copper and lead must be determined under subsection (c)(3).
BOARD NOTE: Derived from 40 CFR 141.80(c)~~ (2016)~~.

"Optimal corrosion control treatment" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while ensuring that the treatment does not cause the water system to violate any national primary drinking water regulations.

"Practical quantitation limit" or "PQL" means the lowest concentration of a contaminant that a well-operated laboratory can reliably achieve within specified limits of precision and accuracy during routine laboratory

operating conditions. The PQL for lead is 0.005 mg/ℓ. The PQL for copper is 0.050 mg/ℓ.
BOARD NOTE: Derived from 40 CFR 141.89(a)(1)(ii) and (a)(1)(iv) ~~(2016)~~.

"Service line sample" means a one-liter sample of water, collected in accordance with Section 611.356(b)(3), that has been standing for at least six hours in a service line.

"Single-family structure" means a building that was constructed as a single-family residence and which is currently used as either a residence or a place of business.

"Small system" means a water system that regularly serves water to 3,300 or fewer persons.

BOARD NOTE: Derived from 40 CFR 141.2 ~~(2016)~~.

c) Lead and Copper Action Levels~~.~~

1) The lead action level is exceeded if the 90th percentile lead level is greater than 0.015 mg/ℓ.

2) The copper action level is exceeded if the 90th percentile copper level is greater than 1.3 mg/ℓ.

3) Suppliers must compute the 90th percentile lead and copper levels as follows:

A) List the results of all lead or copper samples taken during a six-month monitoring period in ascending order, ranging from the sample with the lowest concentration first to the sample with the highest concentration last. Assign each sampling result a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level must be equal to the total number of samples taken.

B) Determine the number for the 90th percentile sample by multiplying the total number of samples taken during the six-month monitoring period by 0.9.

C) The contaminant concentration in the sample with the number yielded by the calculation in subsection (c)(3)(B) is the 90th percentile contaminant level.

D) For suppliers that collect five samples per six-month monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

E) For a supplier that has been allowed by the Agency to collect fewer than five samples in accordance with Section 611.356(c), the sample result with the highest concentration is considered the 90th percentile value.

d) Corrosion Control Treatment Requirements~~.~~

1) All suppliers must install and operate optimal corrosion control treatment.

2) Any supplier that complies with the applicable corrosion control treatment requirements specified by the Agency under Sections 611.351 and 611.352 is deemed in compliance with the treatment requirement of subsection (d)(1).

e) Source Water Treatment Requirements. Any supplier whose system exceeds the lead or copper action level must implement all applicable source water treatment requirements specified by the Agency under Section 611.353.

f) Lead Service Line Replacement Requirements. Any supplier whose system exceeds the lead action level after implementation of applicable corrosion control and source water treatment requirements must complete the lead service line replacement requirements contained in Section 611.354.

g) Public Education Requirements. Under Section 611.355, the supplier must provide a consumer notice of the lead tap water monitoring results to the persons served at each site (tap) that is tested. Any supplier whose system exceeds the lead action level must implement the public education requirements.

h) Monitoring and Analytical Requirements. Suppliers must complete all tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results under this Subpart G in compliance with Sections 611.356, 611.357, 611.358, and 611.359.

i) Reporting Requirements. Suppliers must report to the Agency any information required by the treatment provisions of this Subpart G and Section 611.360.

j) Recordkeeping Requirements. Suppliers must maintain records in accordance with Section 611.361.

k) Violation of National Primary Drinking Water Regulations. Failure to comply with the applicable requirements of this Subpart G, including conditions imposed by the Agency by SEP, will constitute a violation of the national primary drinking water regulations for lead or copper.

BOARD NOTE: Derived from 40 CFR 141.80 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.351 Applicability of Corrosion Control

a) Corrosion Control Required ~~control required~~. Suppliers must complete the applicable corrosion control treatment requirements described in Section 611.352 on or before the deadlines set forth in this Section.

1) Large Systems ~~systems~~. Each large system supplier (one regularly serving more than 50,000 persons) must complete the corrosion control treatment steps specified in subsection (d), unless it is deemed to have optimized corrosion control under subsection (b)(2) or (b)(3).

2) Medium-Sized ~~Medium-sized~~ and Small Systems ~~small systems~~. Each small system supplier (one regularly serving 3,300 or fewer persons) and each medium-sized system (one regularly serving more than 3,300 up to 50,000 persons) must complete the corrosion control treatment steps specified in subsection (e), unless it is deemed to have optimized corrosion control under one of subsections (b)(1), (b)(2), or (b)(3).

b) Suppliers Deemed ~~deemed~~ to Have Optimized Corrosion Control ~~have optimized corrosion control~~. A supplier is deemed to have optimized corrosion control, and is not required to complete the applicable corrosion control treatment steps identified in this Section, if the supplier satisfies one of the criteria specified in subsections (b)(1) through (b)(3). Any such system deemed to have optimized corrosion control under this subsection, and which has treatment in place, must continue to operate and maintain optimal corrosion control treatment and meet any requirements that the Agency determines are appropriate to ensure optimal corrosion control treatment is maintained.

1) Small- or Medium-Sized System Meeting Action Levels ~~medium-sized system meeting action levels~~. A small system or medium-sized system supplier is deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods with monitoring conducted in accordance with Section 611.356.

2) SEP for Equivalent Activities ~~equivalent activities~~ to Corrosion Control ~~corrosion control~~. The Agency must, by a SEP, deem any supplier to have optimized corrosion control treatment if it determines that the supplier has conducted activities equivalent to the corrosion control steps applicable under this Section. In making this determination, the Agency must specify the water quality control parameters representing optimal corrosion control in accordance with Section 611.352(f). A water supplier that is deemed to have optimized corrosion control under this subsection (b)(2) must operate in compliance with the Agency-designated optimal water

quality control parameters in accordance with Section 611.352(g) and must continue to conduct lead and copper tap and water quality parameter sampling in accordance with Sections 611.356(d)(3) and 611.357(d), respectively. A supplier must provide the Agency with the following information in order to support an Agency SEP determination under this subsection (b)(2):

A) The results of all test samples collected for each of the water quality parameters in Section 611.352(c)(3);

B) A report explaining the test methods the supplier used to evaluate the corrosion control treatments listed in Section 611.352(c)(1), the results of all tests conducted, and the basis for the supplier's selection of optimal corrosion control treatment;

C) A report explaining how the supplier has installed corrosion control and how the supplier maintains it to insure minimal lead and copper concentrations at consumer's taps; and

D) The results of tap water samples collected in accordance with Section 611.356 at least once every six months for one year after corrosion control has been installed.

3) Results Less Than Practical Quantitation Level ~~less than practical quantitation level~~ (PQL) for Lead ~~lead~~. Any supplier is deemed to have optimized corrosion control if it submits results of tap water monitoring conducted in accordance with Section 611.356 and source water monitoring conducted in accordance with Section 611.358 that demonstrate that for two consecutive six-month monitoring periods the difference between the 90th percentile tap water lead level, computed under Section 611.350(c)(3), and the highest source water lead concentration is less than the practical quantitation level for lead specified in Section 611.359(a)(1)(B)(i).

A) Those systems whose highest source water lead level is below the method detection limit (MDL) may also be deemed to have optimized corrosion control under this subsection (b) if the 90th percentile tap water lead level is less than or equal to the PQL for lead for two consecutive six-month monitoring periods.

B) Any water system deemed to have optimized corrosion control in accordance with this subsection (b) must continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in Section 611.356(c) and collecting the samples at times and locations specified in Section 611.356(d)(4)(D).

C) Any water system deemed to have optimized corrosion control usnder this subsection (b) must notify the Agency in writing under Section 611.360(a)(3) of any upcoming long-term change in treatment or the addition of a new source, as described in that Section. The Agency must review and approve the addition of a new source or any long-term change in water treatment before the addition or long-term change is implemented by the water system.

D) A supplier is not deemed to have optimized corrosion control under this subsection (b), and must implement corrosion control treatment under subsection (b)(3)(E), unless it meets the copper action level.

E) Any supplier triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this subsection must implement corrosion control treatment in accordance with the deadlines in subsection (e). Any such large system supplier must adhere to the schedule specified in that subsection (e) for a medium-sized system supplier, with the time periods for completing each step being triggered by the date the supplier is no longer deemed to have optimized corrosion control under this subsection (b).

c) Suppliers Not Required ~~not required~~ to Complete Corrosion Control Steps ~~complete corrosion control steps~~ for Having Met Both Action Levels ~~having met both action levels.~~

1) Any small system or medium-sized system supplier, otherwise required to complete the corrosion control steps due to its exceedance of the lead or copper action level, may cease completing the treatment steps after the supplier has fulfilled both of the following conditions:

A) It has met both the copper action level and the lead action level during each of two consecutive six-month monitoring periods conducted under Section 611.356; and

B) The supplier has submitted the results for those two consecutive six-month monitoring periods to the Agency.

2) A supplier that has ceased completing the corrosion control steps under subsection (c)(1) (or the Agency, if appropriate) must resume completion of the applicable treatment steps, beginning with the first treatment step that the supplier previously did not complete in its entirety, if the supplier thereafter exceeds the lead or copper action level during any monitoring period.

3) The Agency may, by SEP, require a supplier to repeat treatment steps previously completed by the supplier where it determines that this is

necessary to properly implement the treatment requirements of this Section. Any such SEP must explain the basis for this decision.

4) The requirement for any small- or medium-sized system supplier to implement corrosion control treatment steps in accordance with subsection (e) (including systems deemed to have optimized corrosion control under subsection (b)(1)) is triggered whenever any small- or medium-sized system supplier exceeds the lead or copper action level.

d) Treatment Steps ~~steps~~ for Large Systems ~~large systems~~. Except as provided in subsections (b)(2) and (b)(3), large system suppliers must have completed the following corrosion control treatment steps (described in the referenced portions of Sections 611.352, 611.356, and 611.357).

1) Step 1: Initial monitoring (Sections 611.356(d)(1) and 611.357(b)) during two consecutive six-month monitoring periods.

2) Step 2: Corrosion control studies (Section 611.352(c)).

3) Step 3: Agency approval of optimal corrosion control treatment (Section 611.352(d)) by a SEP.

4) Step 4: Installing optimal corrosion control treatment (Section 611.352(e)).

5) Step 5: Completing follow-up sampling (Sections 611.356(d)(2) and 611.357(c)).

6) Step 6: Agency review of installation of treatment and approval of optimal water quality control parameters (Section 611.352(f)).

7) Step 7: Operating in compliance with the Agency-specified optimal water quality control parameters (Section 611.352(g)) and continue to conduct tap sampling (Sections 611.356(d)(3) and 611.357(d)).

e) Treatment Steps ~~steps~~ and Deadlines ~~deadlines~~ for Small- ~~small-~~ and Medium-Sized System Suppliers ~~medium-sized system suppliers~~. Except as provided in subsection (b), small- and medium-sized system suppliers must complete the following corrosion control treatment steps (described in the referenced portions of Sections 611.352, 611.356, and 611.357) by the indicated time periods.

1) Step 1: The supplier must conduct initial tap sampling (Sections 611.356(d)(1) and 611.357(b)) until the supplier either exceeds the lead action level or the copper action level or it becomes eligible for reduced monitoring under Section 611.356(d)(4). A supplier exceeding the lead action level or the copper action level must recommend optimal corrosion control treatment (Section 611.352(a)) within six months after the end of the monitoring period during which it exceeds one of the action levels.

2) Step 2: Within 12 months after the end of the monitoring period during which a supplier exceeds the lead action level or the copper action level, the Agency may require the supplier to perform corrosion control studies (Section 611.352(b)). If the Agency does not require the supplier to perform such studies, the Agency must, by a SEP, specify optimal corrosion control treatment (Section 611.352(d)) within the appropriate of the following timeframes:

   A) For medium-sized systems, within 18 months after the end of the monitoring period during which such supplier exceeds the lead action level or the copper action level; or

   B) For small systems, within 24 months after the end of the monitoring period during which such supplier exceeds the lead action level or the copper action level.

3) Step 3: If the Agency requires a supplier to perform corrosion control studies under step 2 (subsection (e)(2)), the supplier must complete the studies (Section 611.352(c)) within 18 months after the Agency requires that such studies be conducted.

4) Step 4: If the supplier has performed corrosion control studies under step 2 (subsection (e)(2)), the Agency must, by a SEP, approve optimal corrosion control treatment (Section 611.352(d)) within six months after completion of step 3 (subsection (e)(3)).

5) Step 5: The supplier must install optimal corrosion control treatment (Section 611.352(e)) within 24 months after the Agency approves that treatment.

6) Step 6: The supplier must complete follow-up sampling (Sections 611.356(d)(2) and 611.357(c)) within 36 months after the Agency approves optimal corrosion control treatment.

7) Step 7: The Agency must review the supplier's installation of treatment and, by a SEP, approve optimal water quality control parameters (Section 611.352(f)) within six months after completion of step 6 (subsection (e)(6)).

8) Step 8: The supplier must operate in compliance with the Agency-approved optimal water quality control parameters (Section 611.352(g)) and continue to conduct tap sampling (Sections 611.356(d)(3) and 611.357(d)).

BOARD NOTE: Derived from 40 CFR 141.81~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.352 Corrosion Control Treatment

Each supplier must complete the corrosion control treatment requirements described below that are applicable to such supplier under Section 611.351.

a) System Recommendation Regarding Corrosion Control Treatment ~~recommendation regarding corrosion control treatment.~~

1) Based on the results of lead and copper tap monitoring and water quality parameter monitoring, small- and medium-sized system suppliers exceeding the lead action level or the copper action level must recommend to the Agency installation of one or more of the corrosion control treatments listed in subsection (c)(1) that the supplier believes constitutes optimal corrosion control for its system.

2) The Agency may, by a SEP, require the supplier to conduct additional water quality parameter monitoring in accordance with Section 611.357(b) to assist it in reviewing the supplier's recommendation.

b) Agency-Required Studies ~~Agency-required studies~~ of Corrosion Control Treatment ~~corrosion control treatment~~. The Agency may, by a SEP, require any small- or medium-sized system supplier that exceeds the lead action level or the copper action level to perform corrosion control studies under subsection (c) to identify optimal corrosion control treatment for its system.

c) Performance of Studies ~~studies.~~

1) Any supplier performing corrosion control studies must evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments, to identify the optimal corrosion control treatment for its system:

A) Alkalinity and pH adjustment;

B) Calcium hardness adjustment; and

C) The addition of a phosphate- or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

2) The supplier must evaluate each of the corrosion control treatments using pipe rig/loop tests; metal coupon tests; partial-system tests; or analyses based on documented analogous treatments in other systems of similar size, water chemistry, and distribution system configuration.

3) The supplier must measure the following water quality parameters in any tests conducted under this subsection (c) before and after evaluating the corrosion control treatments listed above:

A) Lead;

B) Copper;

C) pH;

D) Alkalinity;

E) Calcium;

F) Conductivity;

G) Orthophosphate (when an inhibitor containing a phosphate compound is used);

H) Silicate (when an inhibitor containing a silicate compound is used); and

I) Water temperature.

4) The supplier must identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment, and document such constraints with at least one of the following:

A) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another supplier with comparable water quality characteristics; or

B) Data and documentation demonstrating that the supplier has previously attempted to evaluate a particular corrosion control treatment, finding either that the treatment is ineffective or that it adversely affects other water quality treatment processes.

5) The supplier must evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

6) On the basis of an analysis of the data generated during each evaluation, the supplier must recommend to the Agency, in writing, that treatment option the corrosion control studies indicate constitutes optimal corrosion control treatment for its system. The supplier must provide a rationale for its recommendation, along with all supporting documentation specified in subsections (c)(1) through (c)(5).

d) Agency Approval of Treatment ~~treatment.~~

1) Based on consideration of available information including, where applicable, studies performed under subsection (c) and a supplier's

recommended treatment alternative, the Agency must, by a SEP, either approve the corrosion control treatment option recommended by the supplier, or deny and require investigation and recommendation of alternative corrosion control treatments from among those listed in subsection (c)(1). When approving optimal treatment, the Agency must consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes.

2) The Agency must, in any SEP issued under subsection (d)(1), notify the supplier of the basis for this determination.

e) Installation of Optimal Corrosion Control ~~optimal corrosion control~~. Each supplier must properly install and operate, throughout its distribution system, that optimal corrosion control treatment approved by the Agency under subsection (d).

f) Agency Review ~~review~~ of Treatment ~~treatment~~ and Specification ~~specification~~ of Optimal Water Quality Control Parameters ~~optimal water quality control parameters~~. The Agency must evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the supplier and determine whether it has properly installed and operated the optimal corrosion control treatment approved under ~~pursuant to~~ subsection (d).

1) Upon reviewing the results of tap water and water quality parameter monitoring by the supplier, both before and after the installation of optimal corrosion control treatment, the Agency must, by a SEP, specify the following:

A) A minimum value or a range of values for pH measured at each entry point to the distribution system;

B) A minimum pH value, measured in all tap samples. Such value must be equal to or greater than 7.0, unless the Agency determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the supplier to optimize corrosion control;

C) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, that the Agency determines is necessary to form a passivating film on the interior walls of the pipes of the distribution system;

D) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples;

E) If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

2) The values for the applicable water quality control parameters listed in subsection (f)(1) must be those that the Agency determines reflect optimal corrosion control treatment for the supplier.

3) The Agency may, by a SEP, approve values for additional water quality control parameters determined by the Agency to reflect optimal corrosion control for the supplier's system.

4) The Agency must, in issuing a SEP, explain these determinations to the supplier, along with the basis for its decisions.

g) Continued Operation and Monitoring. All suppliers optimizing corrosion control must continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameter values at or above minimum values or within ranges approved by the Agency under subsection (f), in accordance with this subsection (g) for all samples collected under Section 611.357(d) through (f). Compliance with the requirements of this subsection (g) must be determined every six months, as specified under Section 611.357(d). A water system is out of compliance with the requirements of this subsection for a six-month period if it has excursions for any Agency-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the Agency. Daily values are calculated as provided in subsections (g)(1) through (g)(3). The Agency must delete results that it determines are obvious sampling errors from this calculation.

1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value must be the average of all results collected during the day regardless of whether the samples are collected through continuous monitoring, grab sampling, or a combination of both.

BOARD NOTE: Corresponding 40 CFR 141.82(g)(1) further provides as follows: If USEPA approves an alternative formula under 40 CFR 142.16 in the State's application for a program revision submitted under ~~pursuant to~~ 40 CFR 142.12, the State's formula must be used to aggregate multiple measurements taken at a sampling point for the water quality parameter in lieu of the formula in this subsection (g).

2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value must be the result of that measurement.

3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value must be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

h) Modification of Agency Treatment Decisions ~~treatment decisions.~~

1) On its own initiative, or in response to a request by a supplier, the Agency may, by a SEP, modify its determination of the optimal corrosion control treatment under subsection (d) or of the optimal water quality control parameters under subsection (f).

2) A request for modification must be in writing, explain why the modification is appropriate, and provide supporting documentation.

3) The Agency may modify its determination where it determines that such change is necessary to ensure that the supplier continues to optimize corrosion control treatment. A revised determination must set forth the new treatment requirements, explain the basis for the Agency's decision, and provide an implementation schedule for completing the treatment modifications.

4) Any interested person may submit information to the Agency bearing on whether the Agency should, within its discretion, issue a SEP to modify its determination under subsection (h)(1). An Agency determination not to act on a submission of such information by an interested person is not an Agency determination for the purposes of Sections 39 and 40 of the Act.

i) Treatment Decisions ~~decisions~~ by USEPA. Under the procedures in 40 CFR 142.19, the USEPA Regional Administrator has reserved the prerogative to review treatment determinations made by the Agency under subsections (d), (f), or (h) and issue federal treatment determinations consistent with the requirements of 40 CFR 141.82(d), (e), or (h), where the Regional Administrator finds that the following is true:

1) The Agency has failed to issue a treatment determination by the applicable deadlines contained in Section 611.351 (40 CFR 141.81);

2) The Agency has abused its discretion in a substantial number of cases or in cases affecting a substantial population; or

3) The technical aspects of the Agency's determination would be indefensible in an expected federal enforcement action taken against a supplier.

BOARD NOTE: Derived from 40 CFR 141.82 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.353 Source Water Treatment

Suppliers must complete the applicable source water monitoring and treatment requirements (described in the referenced portions of subsection (b), and in Sections 611.356 and 611.358) by the following deadlines.

a) Deadlines for Completing Source Water Treatment Steps ~~completing source water treatment steps.~~

1) Step 1: A supplier exceeding the lead action level or the copper action level must complete lead and copper and source water monitoring (Section 611.358(b)) and make a treatment recommendation to the Agency (subsection (b)(1)) within 180 days after the end of the monitoring period during which the supplier exceeded the pertinent action level.

2) Step 2: The Agency must, by a SEP, make a determination regarding source water treatment (subsection (b)(2)) within six months after submission of monitoring results under step 1.

3) Step 3: If the Agency requires installation of source water treatment, the supplier must install that treatment (subsection (b)(3)) within 24 months after completion of step 2.

4) Step 4: The supplier must complete follow-up tap water monitoring (Section 611.356(d)(2)) and source water monitoring (Section 611.358(c)) within 36 months after completion of step 2.

5) Step 5: The Agency must, by a SEP, review the supplier's installation and operation of source water treatment and specify MPCs for lead and copper (subsection (b)(4)) within six months after completion of step 4.

6) Step 6: The supplier must operate in compliance with the Agency-specified lead and copper MPCs (subsection (b)(4)) and continue source water monitoring (Section 611.358(d)).

b) Description of Source Water Treatment Requirements~~.~~

1) System Treatment Recommendation ~~treatment recommendation~~. Any supplier that exceeds the lead action level or the copper action level must recommend in writing to the Agency the installation and operation of one of the source water treatments listed in subsection (b)(2). A supplier may recommend that no treatment be installed based on a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

2) Agency Determination Regarding Source Water Treatment ~~determination regarding source water treatment.~~

A) The Agency must complete an evaluation of the results of all source water samples submitted by the supplier to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps.

B) If the Agency determines that treatment is needed, the Agency must, by a SEP, either require installation and operation of the source water treatment recommended by the supplier (if any) or require the installation and operation of another source water treatment from among the following:

i) ion exchange;

ii) reverse osmosis;

iii) lime softening; or

iv) coagulation/filtration.

C) The Agency may request and the supplier must submit such additional information, on or before a certain date, as the Agency determines is necessary to aid in its review.

D) The Agency must notify the supplier in writing of its determination and set forth the basis for its decision.

3) Installation of Source Water Treatment ~~source water treatment~~. Each supplier must properly install and operate the source water treatment approved by the Agency under subsection (b)(2).

4) Agency Review ~~review~~ of Source Water Treatment ~~source water treatment~~ and Specification ~~specification~~ of Maximum Permissible Source Water Levels ~~maximum permissible source water levels~~ (MPCs)~~.~~

A) The Agency must review the source water samples taken by the supplier both before and after the supplier installs source water treatment, and determine whether the supplier has properly installed and operated the approved source water treatment.

B) Based on its review, the Agency must, by a SEP, approve the lead and copper MPCs for finished water entering the supplier's distribution system. Such levels must reflect the contaminant removal capability of the treatment properly operated and maintained.

C) The Agency must explain the basis for its decision under subsection (b)(4)(B).

5) Continued Operation and Maintenance ~~maintenance~~. Each supplier must maintain lead and copper levels below the MPCs approved by the Agency at each sampling point monitored in accordance with Section 611.358. The supplier is out of compliance with this subsection if the level of lead or copper at any sampling point is greater than the MPC approved by the Agency under subsection (b)(4)(B).

6) Modification of Agency Treatment Decisions ~~treatment decisions.~~

A) On its own initiative, or in response to a request by a supplier, the Agency may, by a SEP, modify its determination of the source water treatment under subsection (b)(2) ~~of this Section~~, or the lead and copper MPCs under subsection (b)(4).

B) A request for modification by a supplier must be in writing, explain why the modification is appropriate, and provide supporting documentation.

C) The Agency may, by a SEP, modify its determination where it concludes that such change is necessary to ensure that the supplier continues to minimize lead and copper concentrations in source water.

D) A revised determination made under subsection (b)(6)(C) must set forth the new treatment requirements, explain the basis for the Agency's decision, and provide an implementation schedule for completing the treatment modifications.

E) Any interested person may submit information to the Agency, in writing, that bears on whether the Agency should, within its discretion, issue a SEP to modify its determination under ~~pursuant to~~ subsection (h)(1). An Agency determination not to act on a submission of such information by an interested person is not an Agency determination for the purposes of Sections 39 and 40 of the Act.

7) Treatment Decisions ~~decisions~~ by USEPA. Under the procedures in 40 CFR 142.19, the USEPA Regional Administrator reserves the prerogative to review treatment determinations made by the Agency under subsections (b)(2), (b)(4), or (b)(6) and issue federal treatment determinations consistent with the requirements of 40 CFR 141.83(b)(2), (b)(4), and (b)(6), where the Administrator finds that the following is true:

A) the Agency has failed to issue a treatment determination by the applicable deadline contained in subsection (a);

B) the Agency has abused its discretion in a substantial number of cases or in cases affecting a substantial population; or

C) the technical aspects of the Agency's determination would be indefensible in an expected federal enforcement action taken against a supplier.

BOARD NOTE: Derived from 40 CFR 141.83 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.354 Lead Service Line Replacement

a) Suppliers Required ~~required~~ to Replace Lead Service Lines ~~replace lead service lines.~~

1) If the results from tap samples taken under Section 611.356(d)(2) exceed the lead action level after the supplier has installed corrosion control or source water treatment (whichever sampling occurs later), the supplier must recommence replacing lead service lines in accordance with the requirements of subsection (b).

2) If a supplier is in violation of Section 611.351 or Section 611.353 for failure to install source water or corrosion control treatment, the Agency may, by a SEP, require the supplier to commence lead service line replacement under this Section after the date by which the supplier was required to conduct monitoring under Section 611.356(d)(2) has passed.

b) Annual Replacement ~~replacement~~ of Lead Service Lines ~~lead service lines.~~

1) Initiation of a lead service line replacement program.

A) A supplier that is required to commence lead service line replacement under subsection (a) must annually replace at least seven percent of the initial number of lead service lines in its distribution system.

B) The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins.

C) The supplier must identify the initial number of lead service lines in its distribution system, including an identification of the portions of the system owned by the supplier, based on a materials evaluation, including the evaluation required under Section 611.356(a) and relevant legal authorities (e.g., contracts, local ordinances) regarding the portion owned by the system.

D) The first year of lead service line replacement must begin on the first day following the end of the monitoring period in which the supplier exceeded the action level under subsection (a).

E) If monitoring is required annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs.

F) If the Agency has established an alternate monitoring period by a SEP, then the end of the monitoring period will be the last day of that period.

2) Resumption of a Lead Service Line Replacement Program ~~lead service line replacement program~~ after Cessation ~~cessation.~~

A) A supplier that is resuming a program after cessation of its lead service line replacement program, as allowed under subsection (f), must update its inventory of lead service lines to include those sites that it had previously determined did not require replacement under the sampling provision of subsection (c).

B) The supplier will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that must be replaced per year (seven percent lead service line replacement is based on a 15-year replacement program, so that, for example, a supplier resuming lead service line replacement after previously conducting two years of replacement would divide the updated inventory by 13).

C) For a supplier that has completed a 15-year lead service line replacement program, the Agency must, by a SEP, determine a schedule for replacing or retesting lines that were previously tested out under the completed replacement program, whenever the supplier has re-exceeded the action level.

c) Service Lines Not Needing Replacement ~~lines not needing replacement~~. A supplier is not required to replace any individual lead service line for which the lead concentrations in all service line samples taken from that line under Section 611.356(b)(3) are less than or equal to 0.015 mg/ℓ.

d) A water supplier must replace that portion of the lead service line that it owns. In cases where the supplier does not own the entire lead service line, the supplier must notify the owner of the line, or the owner's authorized agent, that the supplier will replace the portion of the service line that it owns and must offer to replace the owner's portion of the line. A supplier is not required to bear the cost of replacing the privately-owned portion of the line, nor is it required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately-owned portion would be precluded by State, local, or common law. A water supplier that does not replace the entire length of the service line also must complete the following tasks:

1) Notice Prior to Commencement of Work~~.~~

A) At least 45 days prior to commencing the partial replacement of a lead service line, the water supplier must provide notice to the residents of all buildings served by the line explaining that they may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers can take to minimize their exposure to lead.

B) The Agency, by issuing an appropriate SEP, may allow the water supplier to provide notice under the previous sentence less than 45 days prior to commencing partial lead service line replacement where it determines that such replacement is in conjunction with emergency repairs.

C) In addition, the water supplier must inform the residents served by the line that the supplier will, at the supplier's expense, collect a sample from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed by Section 611.356(b)(3), within 72 hours after the completion of the partial replacement of the service line. The supplier must collect the sample and report the results of the analysis to the owner and the residents served by the line within three business days after ~~of~~ receiving the results.

D) Mailed notices post-marked within three business days after ~~of~~ receiving the results must be considered "on time".

2) The water supplier must provide the information required by subsection (d)(1) to the residents of individual dwellings by mail or by other methods approved by the Agency by a SEP. In instances where multi-family dwellings are served by the service line, the water supplier must have the option to post the information at a conspicuous location.

e) Agency Determination ~~determination~~ of Shorter Replacement Schedule ~~shorter replacement schedule.~~

1) The Agency must, by a SEP, require a supplier to replace lead service lines on a shorter schedule than that otherwise required by this Section if it determines, taking into account the number of lead service lines in the system, that such a shorter replacement schedule is feasible.

2) The Agency must notify the supplier of its finding under subsection (e)(1) within six months after the supplier is triggered into lead service line replacement based on monitoring, as referenced in subsection (a).

f) Cessation of Service Line Replacement ~~service line replacement.~~

1) Any supplier may cease replacing lead service lines whenever it fulfills both of the following conditions:

   A) First draw tap samples collected under ~~pursuant to~~ Section 611.356(b)(2) meet the lead action level during each of two consecutive six-month monitoring periods; and

   B) The supplier has submitted those results to the Agency.

2) If any of the supplier's first draw tap samples thereafter exceed the lead action level, the supplier must recommence replacing lead service lines under subsection (b)(2).

g) To demonstrate compliance with subsections (a) through (d), a supplier must report to the Agency the information specified in Section 611.360(e).

BOARD NOTE: Derived from 40 CFR 141.84 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.355 Public Education and Supplemental Monitoring

A supplier that exceeds the lead action level based on tap water samples collected in accordance with Section 611.356 must deliver the public education materials required by subsection (a) in accordance with the requirements of subsection (b). A supplier that exceeds the lead action level must sample the tap water of any customer who requests it in accordance with subsection (c). A supplier must deliver a consumer notice of lead tap water monitoring results to persons who are served by the supplier at each site that the supplier has tested, as specified in subsection (d).

a) Content of Written Public Education Materials ~~written public education materials.~~

1) Community Water Systems ~~water systems~~ and Non-Transient Non-Community Water Systems ~~non-transient non-community water systems~~. A CWS or NTNCWS supplier must include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed in subsections (a)(1)(A) through (a)(1)(F). In addition, the supplier must include the language set forth in subsections (a)(1)(A), (a)(1)(B), and (a)(1)(F) in the materials, exactly as written, except for the text in brackets in these subsections, for which the supplier must include system-specific information. Any additional information presented by a supplier must be consistent with the information set forth in subsections (a)(1)(A) through (a)(1)(F), and the supplier must present the additional information in plain language that can be understood by the general public. The supplier must submit all written public education materials to the Agency.

   A) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [INSERT NAME OF SUPPLIER] found elevated levels of lead in drinking water in some homes/buildings.

Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

BOARD NOTE: The supplier must use the verbatim text set forth in this subsection (a)(1)(A), with the exception that the supplier must insert its name in place of the bracketed text.

B) Health Effects ~~effects~~ of Lead ~~lead~~. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

BOARD NOTE: The supplier must use the verbatim text set forth in this subsection (a)(1)(B).

C) Sources of Lead~~.~~

i) Explain what lead is.

ii) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home and building plumbing materials and service lines that may contain lead.

iii) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

BOARD NOTE: The supplier must use text that provides the information described in this subsection (a)(1)(C).

D) Discuss the steps the consumer can take to reduce his or her exposure to lead in drinking water.

i) Encourage running the water to flush out the lead.

ii) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

iii) Explain that boiling water does not reduce lead levels.

iv) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

v) Suggest that parents have their child's blood tested for lead.

BOARD NOTE: The supplier must use text that provides the information described in this subsection (a)(1)(D).

E) Explain why there are elevated levels of lead in the supplier's drinking water (if known) and what the supplier is doing to reduce the lead levels in homes and buildings in this area.

BOARD NOTE: The supplier must use text that provides the information described in this subsection (a)(1)(E).

F) For more information, call us at [INSERT THE SUPPLIER'S NUMBER] [(IF APPLICABLE), or visit our Web site at [INSERT THE SUPPLIER'S WEB SITE HERE]]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit USEPA's Web site at *http://www.epa.gov/lead* or contact your health care provider.

BOARD NOTE: The supplier must use the verbatim text set forth in this subsection (a)(1)(F), with the exception that the supplier must insert its name in place of the first segment of bracketed text, and it must add the second segment of bracketed text and substitute its Web address for the internal bracketed text.

2) Community Water Systems ~~water systems~~. In addition to including the elements specified in subsection (a)(1), a CWS supplier must do both of the following:

A) It must tell consumers how to get their water tested; and

B) It must discuss lead in plumbing components and the difference between low-lead and lead-free components.

BOARD NOTE: At corresponding 40 CFR 141.85(a)(1) ~~(2016)~~, USEPA allowed the State to require prior approval of written public information materials. Rather than require prior Agency approval, the Board has chosen to allow the Agency to raise any deficiencies that it may perceive using its existing procedure for review of public education materials. The Agency has outlined its standard practice for review of public information materials as follows: The Agency provides a comprehensive public education packet to the supplier together with the notice that the supplier has exceeded the lead action level. That packet includes guidance and templates for the supplier to use in preparing and distributing its public education materials. The supplier must send a copy of the public education materials that it distributes to the Agency, and the Agency reviews the copy of the materials after their distribution to the public. The Agency directly communicates to the supplier any perceived defects in the materials. The Agency will request correction when it perceives minor defects in future distributions of the public education materials, or the Agency will request a redistribution of corrected public education materials when it perceives major defects in the materials already distributed.

b) Delivery of Public Education Materials ~~public education materials.~~

1) The public education materials of a supplier that serves a large proportion of non-English-speaking consumers must contain information in the appropriate languages regarding the importance of the notice, or it must contain a telephone number or address where a person served may contact the supplier to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

2) A CWS supplier that exceeds the lead action level on the basis of tap water samples collected in accordance with Section 611.356 and which is not already conducting public education tasks under this Section must, within 60 days after the end of the monitoring period in which the exceedance occurred, complete the public education tasks according to the following requirements:

A) The CWS supplier must deliver printed materials that meet the content requirements of subsection (a) to all of its bill-paying customers.

B) Methods of Delivery ~~delivery~~ for a CWS Supplier ~~supplier.~~

i) The CWS supplier must contact customers who are most at risk by delivering education materials that meet the content requirements of subsection (a) to local public health agencies, even if the agencies are not located within the supplier's service area, along with an informational notice that encourages distribution to all of the agencies' potentially affected customers or the supplier's users. The supplier must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community-based organizations that serve the target populations, which may include organizations outside the service area of the supplier. If such lists are provided, the supplier must deliver education materials that meet the content requirements of subsection (a) to each of the organizations on the provided lists.

ii) The CWS supplier must contact customers who are most at risk by delivering materials that meet the content requirements of subsection (a) to the organizations listed in subsections (b)(2)(H)(i) through (b)(2)(H)(vi) that are located within the supplier's service area, along with an informational notice that encourages distribution to all the organization's potentially affected customers or supplier's users.

BOARD NOTE: The Board found it necessary to move the text of 40 CFR 141.85(b)(2)(ii)(B)(*1*) through (b)(2)(ii)(B)(*6*) ~~(2007), as added at 72 Fed. Reg. 57782 (Oct. 10, 2007)~~, to appear as subsection (b)(2)(H)(i) through subsection (b)(2)(H)(vi), in order to comport with Illinois Administrative Code codification requirements relating to allowed indent levels in rules.

iii) The CWS supplier must make a good faith effort to locate the organizations listed in subsections (b)(2)(I)(i) through (b)(2)(I)(iii) that are located within the service area and deliver materials that meet the content requirements of subsection (a) to them, along with an informational notice that encourages distribution to all potentially affected customers or users. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the supplier's service area.

BOARD NOTE: The Board found it necessary to move the text of 40 CFR 141.85(b)(2)(ii)(C)(*1*) through (b)(2)(ii)(C)(*3*) ~~(2007), as added at 72 Fed. Reg. 57782 (Oct. 10, 2007)~~, to appear as subsection (b)(2)(I)(i) through subsection (b)(2)(I)(iii), in order to comport with Illinois Administrative Code codification requirements relating to allowed indent levels in rules.

C) No less often than quarterly, the CWS supplier must provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written, except for the text in brackets for which the supplier must include system-specific information:

[INSERT NAME OF SUPPLIER] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call [INSERT NAME OF SUPPLIER] [or visit (INSERT SUPPLIER'S WEB SITE HERE)]. The message or delivery mechanism can be modified in consultation with the Illinois Environmental Protection Agency, Division of Public Water Supply; specifically, the Agency may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

D) The CWS supplier must post material meeting the content requirements of subsection (a) on the supplier's Web site if the CWS supplier serves a population greater than 100,000.

E) The CWS supplier must submit a press release to newspaper, television, and radio stations.

F) In addition to subsections (b)(2)(A) through (b)(2)(E), the CWS supplier must implement at least three activities from one or more of the categories listed below. The educational content and selection of these activities must be determined in consultation with the Agency.

i) Public Service Announcements.

ii) Paid advertisements.

iii) Public Area Information Displays.

iv) E-mails to customers.

v) Public Meetings.

vi) Household Deliveries.

vii) Targeted Individual Customer Contact.

viii) Direct material distribution to all multi-family homes and institutions.

ix) Other methods approved by the State.

G) For a CWS supplier that is required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the Agency has established an alternate monitoring period, by a SEP, the last day of that period.

H) Organizations that the CWS Supplier Must Contact When Required ~~supplier must contact when required~~ to Do So under Subsection ~~subsection~~ (b)(2)(B)(iii)~~.~~

i) Public and private schools or school boards.

ii) Women, Infants and Children (WIC) and Head Start programs.

iii) Public and private hospitals and medical clinics.

vi) Pediatricians.

v) Family planning clinics.

vi) Local welfare agencies.

BOARD NOTE: This subsection (b)(2)(H) corresponds with 40 CFR 141.85(b)(2)(ii)(B)(*1*) through (b)(2)(ii)(B)(*6*) ~~(2016)~~. The Board found it necessary to move the text of those federal provisions to comport with Illinois Administrative Code codification requirements relating to allowed indent levels in rules.

I) Organizations that the CWS Supplier Must Contact When Required ~~supplier must contact when required~~ to Do So Under Subsection ~~do so under subsection~~ (b)(2)(B)(iii)~~.~~

i) Licensed childcare centers.

ii) Public and private preschools.

iii) Obstetricians-gynecologists and midwives.

BOARD NOTE: This subsection (b)(2)(H) corresponds with 40 CFR 141.85(b)(2)(ii)(C)(*1*) through (b)(2)(ii)(C)(*3*) ~~(2007), as added at 72 Fed. Reg. 57782 (Oct. 10, 2007)~~. The Board found it necessary to move the text of those federal provisions to comport with Illinois Administrative Code codification requirements relating to allowed indent levels in rules.

3) As long as a CWS supplier exceeds the action level, it must repeat the activities described in subsection (b)(2), as described in subsections (b)(3)(A) through (b)(3)(D).

A) A CWS supplier must repeat the tasks contained in subsections (b)(2)(A), (b)(2)(B), and (b)(2)(D) every 12 months.

B) A CWS supplier must repeat tasks contained in subsection (b)(2)(C) with each billing cycle.

C) A CWS supplier serving a population greater than 100,000 must post and retain material on a publicly accessible Web site under subsection (b)(2)(D).

D) The CWS supplier must repeat the task in subsection (b)(2)(E) twice every 12 months on a schedule agreed upon with the Agency by a SEP. The Agency must, on a case-by-case basis, by a SEP, extend the time for the supplier to complete the public education tasks set forth in subsection (b)(2) beyond the 60-day limit if it determines that the extended time is needed for implementation purposes; however, the Agency must issue the SEP granting any extension prior to expiration of the 60-day deadline.

4) Within 60 days after the end of the monitoring period in which a NTNCWS supplier exceeds the lead action level (unless it already is repeating public education tasks under subsection (b)(5)), it must deliver the public education materials specified by subsection (a).

A) The public education materials must be delivered as follows:

i) The NTNCWS supplier must post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the supplier; and

ii) The NTNCWS supplier must distribute informational pamphlets or brochures on lead in drinking water to each person served by the NTNCWS supplier. The Agency may, by a SEP, allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as it achieves at least the same coverage.

B) For a NTNCWS supplier that is required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the Agency has established an alternate monitoring period, by a SEP, the last day of that period.

5) A NTNCWS supplier must repeat the tasks set forth in subsection (b)(4) at least once during each calendar year in which the supplier exceeds the lead action level. The Agency must, on a case-by-case basis, by a SEP, extend the time for the supplier to complete the public education tasks set forth in subsection (b)(2) beyond the 60-day limit if it determines that the

extended time is needed for implementation purposes; however, the Agency must issue the SEP granting any extension prior to expiration of the 60-day deadline.

6) A supplier may discontinue delivery of public education materials after it has met the lead action level during the most recent six-month monitoring period conducted under Section 611.356. Such a supplier must begin public education anew in accordance with this Section if it subsequently exceeds the lead action level during any six-month monitoring period.

7) A CWS supplier may apply to the Agency, in writing, to use only the text specified in subsection (a)(1) in lieu of the text in subsections (a)(1) and (a)(2) and to perform the tasks listed in subsections (b)(4) and (b)(5) in lieu of the tasks in subsections (b)(2) and (b)(3) if the following are true:

A) The supplier is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

B) The system provides water as part of the cost of services provided, and it does not separately charge for water consumption.

8) A CWS supplier that serves 3,300 or fewer people may limit certain aspects of its public education programs as follows:

A) With respect to the requirements of subsection (b)(2)(F), a supplier that serves 3,300 or fewer people must implement at least one of the activities listed in that subsection.

B) With respect to the requirements of subsection (b)(2)(B), a supplier that serves 3,300 or fewer people may limit the distribution of the public education materials required under that subsection to facilities and organizations that it serves which are most likely to be visited regularly by pregnant women and children.

C) With respect to the requirements of subsection (b)(2)(E), the Agency may, by a SEP, waive this requirement for a supplier that serves 3,300 or fewer persons, as long as the supplier distributes notices to every household that it serves.

c) Supplemental Monitoring ~~monitoring~~ and Notification ~~notification~~ of Results ~~results~~. A supplier that fails to meet the lead action level on the basis of tap samples collected in accordance with Section 611.356 must offer to sample the tap water of any customer who requests it. The supplier is not required to pay for collecting or analyzing the sample, nor is the supplier required to collect and analyze the sample itself.

d) Requirement for Consumer Notice ~~consumer notice~~ of Tap Water Monitoring Results ~~tap water monitoring results.~~

1) Consumer Notice Requirement ~~notice requirement~~. A supplier must provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of Section 611.356 to the persons served by the water system at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

2) Timing of Consumer Notice ~~consumer notice~~. The supplier must provide the consumer notice as soon as practical, but no later than 30 days after it learns of the tap monitoring results.

3) Content of Consumer Notice ~~consumer notice~~. The consumer notice must include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, a list of steps that consumers can take to reduce exposure to lead in drinking water, and contact information for the water utility. The notice must also provide the maximum contaminant level goal and the action level for lead and the definitions for these two terms from Section 611.883(c).

4) Delivery of Consumer Notice ~~consumer notice~~. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the Agency, by a SEP. For example, upon approval by the Agency, a NTNCWS supplier could post the results on a bulletin board in the facility to allow users to review the information. The supplier must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

BOARD NOTE: Derived from 40 CFR 141.85 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.356 Tap Water Monitoring for Lead and Copper

a) Sampling Site Location ~~site location.~~

1) Selecting a Pool ~~pool~~ of Targeted Sampling Sites ~~targeted sampling sites.~~

A) By the applicable date for commencement of monitoring under subsection (d)(1), each supplier must complete a materials evaluation of its distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this Section.

B) The pool of targeted sampling sites must be sufficiently large to ensure that the supplier can collect the number of lead and copper tap samples required by subsection (c).

C) The supplier must select the sites for collection of first draw samples from this pool of targeted sampling sites.

D) The supplier must not select as sampling sites any faucets that have point-of-use or point-of-entry treatment devices designed to remove or capable of removing inorganic contaminants.

2) Materials Evaluation ~~evaluation.~~

A) A supplier must use the information on lead, copper, and galvanized steel collected under 40 CFR 141.42(d) (special monitoring for corrosivity characteristics) when conducting a materials evaluation.

B) When an evaluation of the information collected under 40 CFR 141.42(d) is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in subsection (a), the supplier must review the following sources of information in order to identify a sufficient number of sampling sites:

i) All plumbing codes, permits, and records in the files of the building departments that indicate the plumbing materials that are installed within publicly- and privately-owned structures connected to the distribution system;

ii) All inspections and records of the distribution system that indicate the material composition of the service connections which connect a structure to the distribution system;

iii) All existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations; and

iv) The supplier must seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities).

3) Tiers of Sampling Sites ~~sampling sites~~. Suppliers must categorize the sampling sites within their pool according to the following tiers:

A) CWS Tier 1 Sampling Sites ~~sampling sites~~. "CWS Tier 1 sampling sites" must include the following single-family structures:

i) Those that contain copper pipes with lead solder installed after 1982 or which contain lead pipes; or

ii) Those that are served by a lead service line.

BOARD NOTE: Subsection (a)(3)(A) was derived from segments of 40 CFR 141.86(a)(3)~~ (2016)~~. This allows the pool of CWS tier 1 sampling sites to consist exclusively of structures served by lead service lines.

B) CWS Tier 2 Sampling Sites~~ sampling sites~~. "CWS Tier 2 sampling sites" must include the following buildings, including multiple-family structures:

i) Those that contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

ii) Those that are served by a lead service line.

BOARD NOTE: Subsection (a)(3)(B) was derived from segments of 40 CFR 141.86(a)(4)~~ (2016)~~. This allows the pool of CWS tier 2 sampling sites to consist exclusively of structures served by lead service lines.

C) CWS Tier 3 Sampling Sites~~ sampling sites~~. "CWS Tier 3 sampling sites" must include the following single-family structures: those that contain copper pipes with lead solder installed before 1983.

BOARD NOTE: Subsection (a)(3)(C) was derived from segments of 40 CFR 141.86(a)(5)~~ (2016)~~.

D) NTNCWS Tier 1 Sampling Sites~~ sampling sites~~. "NTNCWS Tier 1 sampling sites" must include the following buildings:

i) Those that contain copper pipes with lead solder installed after 1982 or which contain lead pipes; or

ii) Those that are served by a lead service line.

BOARD NOTE: Subsection (a)(3)(D) was derived from segments of 40 CFR 141.86(a)(6)~~ (2016)~~. This allows the pool of NTNCWS tier 1 sampling sites to consist exclusively of buildings served by lead service lines.

E) Alternative NTNCWS Sampling Sites~~ sampling sites~~. "Alternative NTNCWS sampling sites" must include the following buildings: those that contain copper pipes with lead solder installed before 1983.

BOARD NOTE: Subsection (a)(3)(E) was derived from segments of 40 CFR 141.86(a)(7) ~~(2016)~~.

4) Selection of Sampling Sites ~~sampling sites~~. Suppliers must select sampling sites for their sampling pool as follows:

A) CWS Suppliers. CWS suppliers must use CWS tier 1 sampling sites, except that the supplier may include CWS tier 2 or CWS tier 3 sampling sites in its sampling pool as follows:

i) If multiple-family residences comprise at least 20 percent of the structures served by a supplier, the supplier may use CWS tier 2 sampling sites in its sampling pool; or

BOARD NOTE: Subsection (a)(4)(A)(i) was derived from a segment of 40 CFR 141.86(a)(3)(ii) ~~(2016)~~.

ii) If the CWS supplier has an insufficient number of CWS tier 1 sampling sites on its distribution system, the supplier may use CWS tier 2 sampling sites in its sampling pool; or

BOARD NOTE: Subsection (a)(4)(A)(ii) was derived from a segment of 40 CFR 141.86(a)(4) ~~(2016)~~.

iii) If the CWS supplier has an insufficient number of CWS tier 1 and CWS tier 2 sampling sites on its distribution system, the supplier may complete its sampling pool with CWS tier 3 sampling sites.

BOARD NOTE: Subsection (a)(4)(A)(iii) was derived from a segment of 40 CFR 141.86(a)(5) ~~(2016)~~.

iv) If the CWS supplier has an insufficient number of CWS tier 1 sampling sites, CWS tier 2 sampling sites, and CWS tier 3 sampling sites, the supplier must use those CWS tier 1 sampling sites, CWS tier 2 sampling sites, and CWS tier 3 sampling sites that it has and complete its sampling pool with representative sites throughout its distribution system for the balance of its sampling sites. For the purpose of this subsection (a)(4)(A)(iv), a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

BOARD NOTE: Subsection (a)(4)(A)(iv) was derived from segments of 40 CFR 141.86(a)(5) ~~(2016)~~.

B) NTNCWS Suppliers ~~suppliers.~~

i) An NTNCWS supplier must select NTNCWS tier 1 sampling sites for its sampling pool.

BOARD NOTE: Subsection (a)(4)(B)(i) was derived from segments of 40 CFR 141.86(a)(6) ~~(2016)~~.

ii) If the NTNCWS supplier has an insufficient number of NTNCWS tier 1 sampling sites, the supplier may complete its sampling pool with alternative NTNCWS sampling sites.

BOARD NOTE: Subsection (a)(4)(B)(ii) was derived from segments of 40 CFR 141.86(a)(7) ~~(2016)~~.

iii) If the NTNCWS supplier has an insufficient number of NTNCWS tier 1 sampling sites and NTNCWS alternative sampling sites, the supplier must use representative sites throughout its distribution system. For the purpose of this subsection (a)(4)(B)(ii), a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

BOARD NOTE: Subsection (a)(4)(B)(iii) was derived from segments of 40 CFR 141.86(a)(7) ~~(2016)~~.

C) Suppliers with Lead Service Lines ~~lead service lines~~. Any supplier whose distribution system contains lead service lines must draw samples during each six-month monitoring period from sampling sites as follows:

i) 50 percent of the samples from sampling sites that contain lead pipes or from sampling sites that have copper pipes with lead solder; and

ii) 50 percent of those samples from sites served by a lead service line.

iii) A supplier that cannot identify a sufficient number of sampling sites served by a lead service line must collect first-draw samples from all of the sites identified as being served by such lines.

BOARD NOTE: Subsection (a)(4)(C) was derived from segments of 40 CFR 141.86(a)(8) ~~(2016)~~. This allows the pool of sampling sites to consist exclusively of structures or buildings served by lead service lines.

b) Sample Collection Methods ~~collection methods.~~

1) All tap samples for lead and copper collected in accordance with this Subpart G, with the exception of lead service line samples collected under Section 611.354(c) and samples collected under subsection (b)(5), must be first-draw samples.

2) First-Draw Tap Samples~~First-draw tap samples.~~

   A) Each first-draw tap sample for lead and copper must be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours.

   B) First-draw samples from residential housing must be collected from the cold water kitchen tap or bathroom sink tap.

   C) First-draw samples from a non-residential building must be one liter in volume and must be collected at an interior tap from which water is typically drawn for consumption.

   D) Non-first-draw samples collected in lieu of first-draw samples under subsection (b)(5) must be one liter in volume and must be collected at an interior tap from which water is typically drawn for consumption.

   E) First-draw samples may be collected by the supplier or the supplier may allow residents to collect first-draw samples after instructing the residents of the sampling procedures specified in this subsection (b).

      i) To avoid problems of residents handling nitric acid, acidification of first-draw samples may be done up to 14 days after the sample is collected.

      ii) After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved USEPA method before the sample can be analyzed.

   F) If a supplier allows residents to perform sampling under subsection (b)(2)(D), the supplier may not challenge the accuracy of sampling results based on alleged errors in sample collection.

3) Service Line Samples~~ line samples.~~

   A) Each service line sample must be one liter in volume and have stood motionless in the lead service line for at least six hours.

   B) Lead service line samples must be collected in one of the following three ways:

i) At the tap after flushing that volume of water calculated as being between the tap and the lead service line based on the interior diameter and length of the pipe between the tap and the lead service line;

ii) Tapping directly into the lead service line; or

iii) If the sampling site is a single-family structure, allowing the water to run until there is a significant change in temperature that would be indicative of water that has been standing in the lead service line.

4) Follow-Up First-Draw Tap Samples~~Follow-up first-draw tap samples.~~

A) A supplier must collect each follow-up first-draw tap sample from the same sampling site from which it collected the previous samples.

B) If, for any reason, the supplier cannot gain entry to a sampling site in order to collect a follow-up tap sample, the supplier may collect the follow-up tap sample from another sampling site in its sampling pool, as long as the new site meets the same targeting criteria and is within reasonable proximity of the original site.

5) Substitute Non-First-Draw Samples ~~non-first-draw samples.~~

A) A NTNCWS supplier or a CWS supplier that meets the criteria of Sections 611.355(b)(7)(A) and (b)(7)(B), that does not have enough taps that can supply first-draw samples, as defined in Section 611.102, may apply to the Agency in writing to substitute non-first-draw samples by a SEP.

B) A supplier approved to substitute non-first-draw samples must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites.

C) The Agency may grant a SEP that waives the requirement for prior Agency approval of non-first-draw sampling sites selected by the system.

c) Number of Samples ~~samples.~~

1) Suppliers must collect at least one sample from the number of sites listed in the first column of Table D (labelled "standard monitoring") during each six-month monitoring period specified in subsection (d).

2) A supplier conducting reduced monitoring under subsection (d)(4) must collect one sample from the number of sites specified in the second column of Table D (labelled "reduced monitoring") during each reduced monitoring period specified in subsection (d)(4). Such reduced monitoring sites must be representative of the sites required for standard monitoring. A supplier whose system has fewer than five drinking water taps that can be used for human consumption and which can meet the sampling site criteria of subsection (a) to reach the required number of sampling sites listed in this subsection (c) must collect multiple samples from individual taps. To accomplish this, the supplier must collect at least one sample from each tap, then it must collect additional samples from those same taps on different days during the monitoring period, in order to collect a total number of samples that meets the required number of sampling sites. Alternatively, the Agency must, by a SEP, allow a supplier whose system has fewer than five drinking water taps to collect a number of samples that is fewer than the number of sites specified in this subsection (c) if it determines that 100 percent of all taps that can be used for human consumption are sampled and that the reduced number of samples will produce the same results as would the collection of multiple samples from some taps. Any Agency approval of a reduction of the minimum number of samples must be based on a request from the supplier or on on-site verification by the Agency. The Agency may, by a SEP, specify sampling locations when a system is conducting reduced monitoring.

d) Timing of Monitoring ~~monitoring.~~

1) Six-Month Sampling Periods. Six-month sampling periods begin on January 1 and July 1 of each year.

A) All large system suppliers must monitor during each consecutive six-month period, except as provided in subsection (d)(4)(B).

B) All small- and medium-sized system suppliers must monitor during each consecutive six-month monitoring period until the following is true:

i) The supplier exceeds the lead action level or the copper action level and is therefore required to implement the corrosion control treatment requirements under Section 611.351, in which case the supplier must continue monitoring in accordance with subsection (d)(2); or

ii) The supplier meets the lead action level and the copper action level during each of two consecutive six-month monitoring periods, in which case the supplier may reduce monitoring in accordance with subsection (d)(4).

2) Monitoring after Installation ~~installation~~ of Corrosion Control ~~corrosion control~~ and Source Water Treatment ~~source water treatment.~~

A) Any large system supplier that installs optimal corrosion control treatment under Section 611.351(d)(4) must monitor during two consecutive six-month monitoring periods.

B) Any small- or medium-sized system supplier that installs optimal corrosion control treatment under Section 611.351(e)(5) must monitor during two consecutive six-month monitoring periods before 36 months after the Agency approves optimal corrosion control treatment, as specified in Section 611.351(e)(6).

C) Any supplier that installs source water treatment under Section 611.353(a)(3) must monitor during two consecutive six-month monitoring periods before 36 months after completion of step 2, as specified in Section 611.353(a)(4).

3) Monitoring after the Agency Specification ~~specification~~ of Water Quality Parameter Values ~~water quality parameter values~~ for Optimal Corrosion Control ~~optimal corrosion control~~. After the Agency specifies the values for water quality control parameters under Section 611.352(f), the supplier must monitor during each subsequent six-month monitoring period, with the first six-month monitoring period to begin on the date the Agency specifies the optimal values.

4) Reduced Monitoring ~~monitoring.~~

A) Reduction to Annual ~~annual~~ for Small- ~~small-~~ and Medium-Sized System Suppliers Meeting ~~medium-sized system suppliers meeting~~ the Lead ~~lead~~ and Copper Action Levels ~~copper action levels~~. A small- or medium-sized system supplier that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of samples in accordance with subsection (c), and reduce the frequency of sampling to once per year. A small- or medium-sized system supplier that collects fewer than five samples as specified in subsection (c) and which meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce its frequency of sampling to once per year. In no case can the supplier reduce the number of samples required below the minimum of one sample per available tap. This reduced sampling may only begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

B) SEP Allowing Reduction ~~allowing reduction~~ to Annual ~~annual~~ for Suppliers Maintaining Water Quality Control Parameters ~~suppliers maintaining water quality control parameters.~~

i) Any supplier that meets the lead action level and which maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Agency under Section 611.352(f) during each of two consecutive six-month monitoring periods may reduce the frequency of monitoring to once per year and the number of lead and copper samples to that specified by subsection (c) if it receives written approval from the Agency in the form of a SEP. This reduced sampling may only begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

ii) The Agency must review monitoring, treatment, and other relevant information submitted by the water system in accordance with Section 611.360, and must notify the system in writing by a SEP when it determines the system is eligible to reduce its monitoring frequency to once every three years under this subsection (d)(4).

iii) The Agency must review, and where appropriate, revise its determination under subsection (d)(4)(B)(i) when the supplier submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available to the Agency.

C) Reduction to Triennial ~~triennial~~ for Small- ~~small-~~ and Medium-Sized System Suppliers ~~medium-sized system suppliers.~~

i) Small- and Medium-Sized System Suppliers Meeting Lead ~~medium-sized system suppliers meeting lead~~ and Copper Action Levels ~~copper action levels~~. A small- or medium-sized system supplier that meets the lead action level and which meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years.

ii) SEP for Suppliers Meeting Optimal Corrosion Control Treatment ~~suppliers meeting optimal corrosion control treatment~~. Any supplier that maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the Agency under

Section 611.352(f) during three consecutive years of monitoring may reduce its monitoring frequency from annual to once every three years if it receives written approval from the Agency in the form of a SEP. Samples collected once every three years must be collected no later than every third calendar year.

iii) The Agency must review, and where appropriate, revise its determination under subsection (d)(4)(C)(ii) when the supplier submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available to the Agency.

D) Sampling at a Reduced Frequency ~~reduced frequency~~. A supplier that reduces the number and frequency of sampling must collect these samples from representative sites included in the pool of targeted sampling sites identified in subsection (a), preferentially selecting those sampling sites from the highest tier first. Suppliers sampling annually or less frequently must conduct the lead and copper tap sampling during the months of June, July, August, or September, unless the Agency has approved a different sampling period in accordance with subsection (d)(4)(D)(i).

i) The Agency may grant a SEP that approves a different period for conducting the lead and copper tap sampling for systems collecting a reduced number of samples. Such a period must be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. For a NTNCWS supplier that does not operate during the months of June through September and for which the period of normal operation where the highest levels of lead are most likely to occur is not known, the Agency must designate a period that represents a time of normal operation for the system. This reduced sampling may only begin during the period approved or designated by the Agency in the calendar year immediately following the end of the second consecutive six-month monitoring period for systems initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for a supplier initiating triennial monitoring.

ii) A supplier monitoring annually that has been collecting samples during the months of June through September and which receives Agency approval to alter its sample collection period under subsection (d)(4)(D)(i) must collect its next round of samples during a time period that ends no later than 21 months after the previous round of sampling. A supplier monitoring once every three years that has been collecting samples during the months of June through September and which receives Agency approval to alter the sampling collection period as provided in subsection (d)(4)(D)(i) must collect its next round of samples during a time period that ends no later than 45 months after the previous round of sampling. Subsequent rounds of sampling must be collected annually or once every three years, as required by this Section. A small system supplier with a waiver granted under subsection (g) that has been collecting samples during the months of June through September and which receives Agency approval to alter its sample collection period under subsection (d)(4)(D)(i) must collect its next round of samples before the end of the nine-year compliance cycle (as that term is defined in Section 611.101).

E) Any water system that demonstrates for two consecutive six-month monitoring periods that the tap water lead level computed under Section 611.350(c)(3) is less than or equal to 0.005 mg/ℓ and that the tap water copper level computed under Section 611.350(c)(3) is less than or equal to 0.65 mg/ℓ may reduce the number of samples in accordance with subsection (c) and reduce the frequency of sampling to once every three calendar years.

F) Resumption of Standard Monitoring ~~standard monitoring.~~

i) Small- or Medium-Sized Suppliers Exceeding Lead ~~medium-sized suppliers exceeding lead~~ or Copper Action Level ~~copper action level~~. A small- or medium-sized system supplier subject to reduced monitoring that exceeds the lead action level or the copper action level must resume sampling in accordance subsection (d)(3) and collect the number of samples specified for standard monitoring under subsection (c). Such a supplier must also conduct water quality parameter monitoring in accordance with Section 611.357 (b), (c), or (d) (as appropriate) during the six-month monitoring period in which it exceeded the action level. Any such supplier may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subsection (c) after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of subsection (d)(4)(A). Any such supplier may resume monitoring once every three years for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (d)(4)(C) or (d)(4)(E).

ii) Suppliers Failing ~~failing~~ to Operate ~~operate~~ within Water Quality Control Parameters ~~water quality control parameters~~. Any supplier subject to reduced monitoring frequency that fails to meet the lead action level during any four-month monitoring period or that fails to operate within the range of values for the water quality control parameters specified under Section 611.352(f) for more than nine days in any six-month period specified in Section 611.357(d) must conduct tap water sampling for lead and copper at the frequency specified in subsection (d)(3), must collect the number of samples specified for standard monitoring under subsection (c), and must resume monitoring for water quality parameters within the distribution system in accordance with Section 611.357(d). This standard tap water sampling must begin no later than the six-month period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion. A supplier may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system only if it fulfills the conditions set forth in subsection (d)(4)(H).

BOARD NOTE: The Board moved the material from the last sentence of 40 CFR 141.86(d)(4)(vi)(B) and 40 CFR 141.86(d)(4)(vi)(B)(*1*) through (d)(4)(vi)(B)(*3*) ~~(2007)~~ to subsections (d)(4)(H) and (d)(4)(H)(i) through (d)(4)(H)(iii), since Illinois Administrative Code codification requirements allow subsections only to four indent levels.

G) Any water supplier subject to a reduced monitoring frequency under subsection (d)(4) must notify the Agency in writing in accordance with Section 611.360(a)(3) of any upcoming long-term change in treatment or addition of a new source as described in that Section. The Agency must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the supplier. The Agency may, by a SEP, require the system to resume sampling in accordance with subsection (d)(3) and collect the number of samples specified for standard monitoring under subsection (c) or take other appropriate steps such as increased water quality parameter monitoring or re-evaluation of its corrosion control treatment given the potentially different water quality considerations.

H) A supplier required under subsection (d)(4)(F) to resume monitoring in accordance with Section 611.357(d) may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

i) The supplier may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subsection (c) after it has completed two subsequent six-month rounds of monitoring that meet the criteria of subsection (d)(4)(B) and the supplier has received written approval from the Agency by a SEP that it is appropriate to resume reduced monitoring on an annual frequency. This sampling must begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

ii) The supplier may resume monitoring for lead and copper once every three years at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (d)(4)(C) or (d)(4)(E) and the system has received a SEP from the Agency that it is appropriate to resume monitoring once every three years.

iii) The supplier may reduce the number of water quality parameter tap water samples required in accordance with Section 611.357(e)(1) and the frequency with which it collects such samples in accordance with Section 611.357(e)(2). Such a system may not resume monitoring once every three years for water quality parameters at the tap until it demonstrates, in accordance with the requirements of Section 611.357(e)(2), that it has re-qualified for monitoring once every three years.

BOARD NOTE: Subsections (d)(4)(H) and (d)(4)(H)(i) through (d)(4)(H)(iii) are derived from the last sentence of 40 CFR 141.86(d)(4)(vi)(B) and 40 CFR 141.86(d)(4)(vi)(B)(*1*) through (d)(4)(vi)(B)(*3*) ~~(2016)~~, since Illinois Administrative Code codification requirements allow only four indent levels of subsections.

e) Additional Monitoring ~~monitoring~~. The results of any monitoring conducted in addition to the minimum requirements of this Section must be considered by the supplier and the Agency in making any determinations (i.e., calculating the 90th percentile lead action level or the copper level) under this Subpart G.

f) Invalidation of Lead ~~lead~~ or Copper Tap Water Samples ~~copper tap water samples~~. A sample invalidated under this subsection does not count toward determining lead or copper 90th percentile levels under Section 611.350(c)(3) or toward meeting the minimum monitoring requirements of subsection (c).

1) The Agency must invalidate a lead or copper tap water sample if it determines that one of the following conditions exists:

A) The laboratory establishes that improper sample analysis caused erroneous results;

B) The sample was taken from a site that did not meet the site selection criteria of this Section;

C) The sample container was damaged in transit; or

D) There is substantial reason to believe that the sample was subject to tampering.

2) The supplier must report the results of all samples to the Agency and all supporting documentation for samples the supplier believes should be invalidated.

3) To invalidate a sample under subsection (f)(1), the decision and the rationale for the decision must be documented in writing. The Agency may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

4) The water supplier must collect replacement samples for any samples invalidated under this Section if, after the invalidation of one or more samples, the supplier has too few samples to meet the minimum requirements of subsection (c). Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the Agency invalidates the sample or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period must not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples must be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

g) Monitoring Waivers ~~waivers~~ for Small System Suppliers ~~small system suppliers~~. Any small system supplier that meets the criteria of this subsection (g) may apply to the Agency to reduce the frequency of monitoring for lead and copper under this Section to once every nine years (i.e., a "full waiver") if it meets all of the materials criteria specified in subsection (g)(1) and all of the monitoring criteria specified in subsection (g)(2). Any small system supplier that meets the criteria in subsections (g)(1) and (g)(2) only for lead, or only for copper, may apply to the

State for a waiver to reduce the frequency of tap water monitoring to once every nine years for that contaminant only (i.e., a "partial waiver").

1) Materials Criteria ~~criteria~~. The supplier must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials or copper-containing materials, as those terms are defined in this subsection (g)(1), as follows:

   A) Lead. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for lead (i.e., a "lead waiver"), the water supplier must provide certification and supporting documentation to the Agency that the system is free of all lead-containing materials, as follows:

      i) It contains no plastic pipes that contain lead plasticizers, or plastic service lines that contain lead plasticizers; and

      ii) It is free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the requirements ~~specifications~~ of Section 611.126(b) ~~Standard 61, section 9, incorporated by reference in Section 611.102~~.

      BOARD NOTE: Corresponding 40 CFR 141.86(g)(1)(i)(B) specifies "any standard established pursuant to 42 USC 300g-6(e) (SDWA section 1417(e))". Congress changed the lead standards for fittings and fixtures in for the Reduction of Lead in Drinking Water Act, P.A. 111-380, § 2(a)(2) and (b), 124 Stat. 4131 (Jan. 4, 2011). The Board incorporated the statutory changes into this Section by referencing Section 611.126(b). ~~USEPA has stated that the NSF standard is that standard. See 62 Fed. Reg. 44684 (Aug. 22, 1997).~~

   B) Copper. To qualify for a full waiver, or a waiver of the tap water monitoring requirements for copper (i.e., a "copper waiver"), the water supplier must provide certification and supporting documentation to the Agency that the system contains no copper pipes or copper service lines.

2) Monitoring Criteria ~~criteria~~ for Waiver Issuance ~~waiver issuance~~. The supplier must have completed at least one six-month round of standard tap water monitoring for lead and copper at sites approved by the Agency and from the number of sites required by subsection (c) and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted

since the system became free of all lead-containing or copper-containing materials, as appropriate, meet the following criteria:

A) Lead Levels ~~levels~~. To qualify for a full waiver, or a lead waiver, the supplier must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/ℓ.

B) Copper Levels ~~levels~~. To qualify for a full waiver, or a copper waiver, the supplier must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/ℓ.

3) State Approval ~~approval~~ of Waiver Application ~~waiver application~~. The Agency must notify the supplier of its waiver determination by a SEP, in writing, setting forth the basis of its decision and any condition of the waiver. As a condition of the waiver, the Agency may require the supplier to perform specific activities (e.g., limited monitoring, periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead or copper concentration of concern in tap water. The small system supplier must continue monitoring for lead and copper at the tap as required by subsections (d)(1) through (d)(4), as appropriate, until it receives written notification from the Agency that the waiver has been approved.

4) Monitoring Frequency ~~frequency~~ for Suppliers ~~suppliers~~ with Waivers ~~waivers.~~

A) A supplier with a full waiver must conduct tap water monitoring for lead and copper in accordance with subsection (d)(4)(D) at the reduced number of sampling sites identified in subsection (c) at least once every nine years and provide the materials certification specified in subsection (g)(1) for both lead and copper to the Agency along with the monitoring results. Samples collected every nine years must be collected no later than every ninth calendar year.

B) A supplier with a partial waiver must conduct tap water monitoring for the waived contaminant in accordance with subsection (d)(4)(D) at the reduced number of sampling sites specified in subsection (c) at least once every nine years and provide the materials certification specified in subsection (g)(1) pertaining to the waived contaminant along with the monitoring results. Such a supplier also must continue to monitor for the non-waived contaminant in accordance with requirements of subsections (d)(1) through (d)(4), as appropriate.

C) Any supplier with a full or partial waiver must notify the Agency in writing in accordance with Section 611.360(a)(3) of any upcoming long-term change in treatment or addition of a new source, as described in that Section. The Agency must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the supplier. The Agency has the authority to require the supplier to add or modify waiver conditions (e.g., require recertification that the supplier's system is free of lead-containing or copper-containing materials, require additional rounds of monitoring), if it deems such modifications are necessary to address treatment or source water changes at the system.

D) If a supplier with a full or partial waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate (e.g., as a result of new construction or repairs), the supplier must notify the Agency in writing no later than 60 days after becoming aware of such a change.

5) Continued Eligibility ~~eligibility~~. If the supplier continues to satisfy the requirements of subsection (g)(4), the waiver will be renewed automatically, unless any of the conditions listed in subsections (g)(5)(A) through (g)(5)(C) occur. A supplier whose waiver has been revoked may re-apply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of subsections (g)(1) and (g)(2).

A) A supplier with a full waiver or a lead waiver no longer satisfies the materials criteria of subsection (g)(1)(A) or has a 90th percentile lead level greater than 0.005 mg/ℓ.

B) A supplier with a full waiver or a copper waiver no longer satisfies the materials criteria of subsection (g)(1)(B) or has a 90th percentile copper level greater than 0.65 mg/ℓ.

C) The State notifies the supplier, in writing, that the waiver has been revoked, setting forth the basis of its decision.

6) Requirements Following Waiver Revocation ~~following waiver revocation~~. A supplier whose full or partial waiver has been revoked by the Agency is subject to the corrosion control treatment and lead and copper tap water monitoring requirements, as follows:

A) If the supplier exceeds the lead or copper action level, the supplier must implement corrosion control treatment in accordance with the deadlines specified in Section 611.351(e), and any other applicable requirements of this Subpart G.

B) If the supplier meets both the lead and the copper action level, the supplier must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sampling sites specified in subsection (c).

7) Pre-Existing Waivers~~Pre-existing waivers~~. Small system supplier waivers approved by the Agency in writing prior to April 11, 2000 must remain in effect under the following conditions:

A) If the supplier has demonstrated that it is both free of lead-containing and copper-containing materials, as required by subsection (g)(1) and that its 90th percentile lead levels and 90th percentile copper levels meet the criteria of subsection (g)(2), the waiver remains in effect so long as the supplier continues to meet the waiver eligibility criteria of subsection (g)(5). The first round of tap water monitoring conducted under subsection (g)(4) must be completed no later than nine years after the last time the supplier monitored for lead and copper at the tap.

B) If the supplier has met the materials criteria of subsection (g)(1) but has not met the monitoring criteria of subsection (g)(2), the supplier must conduct a round of monitoring for lead and copper at the tap demonstrating that it met the criteria of subsection (g)(2). Thereafter, the waiver must remain in effect as long as the supplier meets the continued eligibility criteria of subsection (g)(5). The first round of tap water monitoring conducted under subsection (g)(4) must be completed no later than nine years after the round of monitoring conducted under subsection (g)(2).

BOARD NOTE: Derived from 40 CFR 141.86~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.357 Monitoring for Water Quality Parameters

All large system suppliers, and all small- and medium-sized system suppliers that exceed the lead action level or the copper action level, must monitor water quality parameters in addition to lead and copper in accordance with this Section. The requirements of this Section are summarized in Table G~~ of this Part~~.

a) General Requirements~~.~~

1) Sample Collection Methods~~ collection methods.~~

A) Use of Tap Samples~~ tap samples~~. The totality of all tap samples collected by a supplier must be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the supplier, and seasonal variability. Although a supplier may conveniently conduct tap sampling for water quality parameters at sites used for coliform sampling performed under ~~pursuant to~~ Subpart L, it is not required to do so, and a supplier is not required to perform tap sampling under ~~pursuant to~~ this Section at taps targeted for lead and copper sampling under Section 611.356(a).

B) Use of Entry Point Samples ~~entry point samples~~. Each supplier must collect samples at entry points to the distribution system from locations representative of each source after treatment. If a supplier draws water from more than one source and the sources are combined before distribution, the supplier must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

2) Number of Samples ~~samples.~~

A) Tap Samples ~~samples~~. Each supplier must collect two tap samples for applicable water quality parameters during each six-month monitoring period specified under subsections (b) through (e) from the number of sites indicated in the first column of Table E ~~of this Part~~.

B) Entry Point Samples ~~point samples.~~

i) Initial Monitoring ~~monitoring~~. Except as provided in subsection (c)(3), each supplier must collect two samples for each applicable water quality parameter at each entry point to the distribution system during each six-month monitoring period specified in subsection (b).

ii) Subsequent Monitoring ~~monitoring~~. Each supplier must collect one sample for each applicable water quality parameter at each entry point to the distribution system during each six-month monitoring period specified in subsections (c) through (e).

b) Initial Sampling~~.~~

1) Large Systems ~~systems~~. Each large system supplier must measure the applicable water quality parameters specified in subsection (b)(3) at taps and at each entry point to the distribution system during each six-month monitoring period specified in Section 611.356(d)(1).

2) Small- and Medium-Sized Systems ~~medium-sized systems~~. Each small- and medium-sized system supplier must measure the applicable water quality parameters specified in subsection (b)(3) at the locations specified in this subsection during each six-month monitoring period

specified in Section 611.356(d)(1) during which the supplier exceeds the lead action level or the copper action level.

3) Water Quality Parameters ~~quality parameters.~~

A) pH;

B) Alkalinity;

C) Orthophosphate, when an inhibitor containing a phosphate compound is used;

D) Silica, when an inhibitor containing a silicate compound is used;

E) Calcium;

F) Conductivity; and

G) Water temperature.

c) Monitoring after Installation ~~installation~~ of Corrosion Control ~~corrosion control.~~

1) Large Systems ~~systems~~. Each large system supplier that installs optimal corrosion control treatment under ~~pursuant to~~ Section 611.351(d)(4) must measure the water quality parameters at the locations and frequencies specified in subsections (c)(4) and (c)(5) during each six-month monitoring period specified in Section 611.356(d)(2)(A).

2) Small- and Medium-Sized Systems ~~medium-sized systems~~. Each small- or medium-sized system that installs optimal corrosion control treatment under ~~pursuant to~~ Section 611.351(e)(5) must measure the water quality parameters at the locations and frequencies specified in subsections (c)(4) and (c)(5) during each six-month monitoring period specified in Section 611.356(d)(2)(B) in which the supplier exceeds the lead action level or the copper action level.

3) Any groundwater system can limit entry point sampling described in subsection (c)(2) to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated groundwater sources mixes with water from treated groundwater sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this subsection, the system must provide to the Agency written information identifying the selected entry points and documentation, including information on seasonal variability, sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

4) Tap water samples, two samples at each tap for each of the following water quality parameters:

A) pH;

B) Alkalinity;

C) Orthophosphate, when an inhibitor containing a phosphate compound is used;

D) Silica, when an inhibitor containing a silicate compound is used; and

E) Calcium, when calcium carbonate stabilization is used as part of corrosion control.

5) Entry point samples, except as provided in subsection (c)(3), one sample at each entry point to the distribution system every two weeks (bi-weekly) for each of the following water quality parameters:

A) pH;

B) When alkalinity is adjusted as part of optimal corrosion control, a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

C) When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable).

d) Monitoring after the Agency Specifies Water Quality Parameter Values ~~specifies water quality parameter values~~ for Optimal Corrosion Control ~~optimal corrosion control.~~

1) Large System Suppliers ~~system suppliers~~. After the Agency has specified the values for applicable water quality control parameters reflecting optimal corrosion control treatment under ~~pursuant to~~ Section 611.352(f), each large system supplier must measure the applicable water quality parameters in accordance with subsection (c) and determine compliance with the requirements of Section 611.352(g) every six months with the first six-month period to begin on either January 1 or July 1, whichever comes first, after the Agency specifies the optimal values under Section 611.352(f).

2) Small- and Medium-Sized System Suppliers ~~medium-sized system suppliers~~. Each small- or medium-sized system supplier must conduct such monitoring during each six-month monitoring period specified in this subsection (d) in which the supplier exceeds the lead action level or the

copper action level. For any such small and medium-size system that is subject to a reduced monitoring frequency under ~~pursuant to~~ Section 611.356(d)(4) at the time of the action level exceedance, the start of the applicable six-month monitoring period under this subsection (d) must coincide with the start of the applicable monitoring period under Section 611.356(d)(4).

3) Compliance with Agency-designated optimal water quality parameter values must be determined as specified under Section 611.352(g).

e) Reduced Monitoring ~~monitoring.~~

1) Reduction in Tap Monitoring ~~tap monitoring~~. A supplier that has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under subsection (d) must continue monitoring at the entry points to the distribution system as specified in subsection (c)(4). Such a supplier may collect two samples from each tap for applicable water quality parameters from the reduced number of sites indicated in the second column of Table E ~~of this Part~~ during each subsequent six-month monitoring period.

2) Reduction in Monitoring Frequency ~~monitoring frequency.~~

A) Staged Reductions ~~reductions~~ in Monitoring Frequency ~~monitoring frequency.~~

i) Annual Monitoring ~~monitoring~~. A supplier that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified under ~~pursuant to~~ Section 611.352(f) during three consecutive years of monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (e)(1) from every six months to annually. This reduced sampling may only begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs.

ii) Triennial Monitoring ~~monitoring~~. A supplier that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified under ~~pursuant to~~ Section 611.352(f) during three consecutive years of annual monitoring under subsection (e)(2)(A)(i) may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in subsection (e)(1) from annually to once every three years. This reduced sampling may only begin no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

B) A water supplier may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in subsection (e)(1) to every three years if it demonstrates that it has fulfilled the conditions set forth in subsections (e)(2)(B)(i) through (e)(2)(B)(iii) during two consecutive monitoring periods, subject to the limitation of subsection (e)(2)(B)(iv).

i) The supplier must demonstrate that its tap water lead level at the 90th percentile is less than or equal to the PQL for lead specified in Section 611.359(a)(1)(B).

ii) The supplier must demonstrate that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/ℓ for copper in Section 611.350(c)(2).

iii) The supplier must demonstrate that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the Agency under Section 611.352(f).

iv) Monitoring conducted every three years must be done no later than every third calendar year.

3) A supplier that conducts sampling annually or every three years must collect these samples evenly throughout the calendar year so as to reflect seasonal variability.

4) Any supplier subject to a reduced monitoring frequency under ~~pursuant to~~ this subsection that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified under ~~pursuant to~~ Section 611.352(f) for more than nine days in any six-month period specified in Section 611.352(g) must resume tap water sampling in accordance with the number and frequency requirements of subsection (d). Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in subsection (e)(1) after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that subsection or may resume monitoring once every three years for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either subsection (e)(2)(A) or (e)(2)(B).

f) Additional Monitoring ~~monitoring~~ by Suppliers ~~suppliers~~. The results of any monitoring conducted in addition to the minimum requirements of this Section must be considered by the supplier and the Agency in making any determinations (i.e., determining concentrations of water quality parameters) under this Section or Section 611.352.

BOARD NOTE: Derived from 40 CFR 141.87 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.358 Monitoring for Lead and Copper in Source Water

a) Sample Location, Collection Methods, ~~location, collection methods,~~ and Number ~~number~~ of Samples ~~samples.~~

1) A supplier that fails to meet the lead action level or the copper action level on the basis of tap samples collected in accordance with Section 611.356 must collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

A) A groundwater supplier must take a minimum of one sample at every entry point to the distribution system that is representative of each well after treatment (hereafter called a sampling point). The supplier must take one sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

B) A surface water supplier must take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point that is representative of each source after treatment (hereafter called a sampling point). The system must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

BOARD NOTE: For the purposes of this subsection (a)(1)(B), surface water systems include systems with a combination of surface and ground sources.

C) If a supplier draws water from more than one source and the sources are combined before distribution, the supplier must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

D) The Agency may, by a SEP, reduce the total number of samples that must be analyzed by allowing the use of compositing.

Compositing of samples must be done by certified laboratory personnel. Composite samples from a maximum of five samples are allowed, provided that if the lead concentration in the composite sample is greater than or equal to 0.001 mg/ℓ or the copper concentration is greater than or equal to 0.160 mg/ℓ, then the supplier must do either of the following:

i) The supplier must take and analyze a follow-up sample within 14 days at each sampling point included in the composite; or

ii) If duplicates of or sufficient quantities from the original samples from each sampling point used in the composite are available, the supplier may use these instead of resampling.

2) SEP Requiring ~~requiring~~ an Additional Sample ~~additional sample.~~

A) When the Agency determines that the results of sampling indicate an exceedance of the lead or copper MPC established under Section 611.353(b)(4), it must, by a SEP, require the supplier to collect one additional sample as soon as possible after the initial sample at the same sampling point, but no later than two weeks after the supplier took the initial sample.

B) If a supplier takes an Agency-required confirmation sample for lead or copper, the supplier must average the results obtained from the initial sample with the results obtained from the confirmation sample in determining compliance with the Agency-specified lead and copper MPCs.

i) Any analytical result below the MDL must be considered as zero for the purposes of averaging.

ii) Any value above the MDL but below the PQL must either be considered as the measured value or be considered one-half the PQL.

b) Monitoring Frequency ~~frequency~~ after System Exceeds Tap Water Action Level ~~system exceeds tap water action level~~. A supplier that exceeds the lead action level or the copper action level in tap sampling must collect one source water sample from each entry point to the distribution system no later than six months after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the Agency has established an alternate monitoring period by a SEP, the last day of that period.

c) Monitoring Frequency ~~frequency~~ after Installation ~~installation~~ of Source Water Treatment ~~source water treatment~~. A supplier that installs source water treatment under Section 611.353(a)(3) must collect an additional source water sample from each entry point to the distribution system during each of two consecutive six-month monitoring periods on or before 36 months after completion of step 2, as specified in Section 611.353(a)(4).

d) Monitoring Frequency ~~frequency~~ after the Agency Has Specified ~~has specified~~ the Lead ~~lead~~ and Copper ~~copper~~ MPCs or Has Determined That Source Water Treatment Is Not Needed ~~has determined that source water treatment is not needed.~~

1) A supplier must monitor at the frequency specified by subsection (d)(1)(A) or (d)(1)(B) where the Agency has specified the MPCs under Section 611.353(b)(4) or has determined that the supplier is not required to install source water treatment under ~~pursuant to~~ Section 611.353(b)(2).

A) GWS Suppliers ~~suppliers.~~

i) A GWS supplier required to sample by subsection (d)(1) must collect samples once during the three-year compliance period (as that term is defined in Section 611.101) during which the Agency makes its determination under Section 611.353(b)(4) or 611.353(b)(2).

ii) A GWS supplier required to sample by subsection (d)(1) must collect samples once during each subsequent compliance period.

iii) Triennial samples must be collected every third calendar year.

B) A SWS or mixed system supplier must collect samples once during each calendar year, the first annual monitoring period to begin during the year in which the Agency makes its determination under Section 611.353(b)(4) or 611.353(b)(2).

2) A supplier is not required to conduct source water sampling for lead or copper if the supplier meets the action level for the specific contaminant in all tap water samples collected during the entire source water sampling period applicable under subsection (d)(1)(A) or (d)(1)(B).

e) Reduced Monitoring Frequency ~~monitoring frequency.~~

1) A GWS supplier may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle (as that term is defined in Section 611.101), provided that the samples are

collected no later than every ninth calendar year, and only if the supplier meets one of the following criteria:

A) The supplier demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the State in Section 611.353(b)(4) during at least three consecutive compliance periods under subsection (d)(1); or

B) The Agency has determined, by a SEP, that source water treatment is not needed and the system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under subsection (d)(1), the concentration of lead in source water was less than or equal to 0.005 mg/ℓ and the concentration of copper in source water was less than or equal to 0.65 mg/ℓ.

2) A SWS or mixed system supplier may reduce the monitoring frequency in subsection (d)(1) to once during each nine-year compliance cycle (as that term is defined in Section 611.101), provided that the samples are collected no later than every ninth calendar year, and only if the supplier meets one of the following criteria:

A) The supplier demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the Agency under Section 611.353(b)(4) for at least three consecutive years; or

B) The Agency has determined, by a SEP, that source water treatment is not needed and the supplier demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/ℓ and the concentration of copper in source water was less than or equal to 0.65 mg/ℓ.

3) A supplier that uses a new source of water is not eligible for reduced monitoring for lead or copper until it demonstrates by samples collected from the new source during three consecutive monitoring periods, of the appropriate duration provided by subsection (d)(1), that lead or copper concentrations are below the MPC as specified by the Agency under Section 611.353(a)(4).

BOARD NOTE: Derived from 40 CFR 141.88~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.359 Analytical Methods

Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature must be conducted using the methods set forth in Section 611.611(a).

a) Analyses for lead and copper performed for the purposes of compliance with this Subpart G must only be conducted by a certified laboratory in one of the categories listed in Section 611.490(a). To obtain certification to conduct analyses for lead and copper, laboratories must do the following:

1) Analyze performance evaluation samples that include lead and copper provided by USEPA Environmental Monitoring and Support Laboratory or equivalent samples provided by the Agency;

2) Achieve quantitative acceptance limits as follows:

A) For lead: ±30 percent of the actual amount in the performance evaluation sample when the actual amount is greater than or equal to 0.005 mg/ℓ (the PQL for lead is 0.005 mg/ℓ);

B) For copper: ±10 percent of the actual amount in the performance evaluation sample when the actual amount is greater than or equal to 0.050 mg/ℓ (the PQL for copper is 0.050 mg/ℓ);

3) Achieve the method detection limit (MDL) for lead (0.001 mg/ℓ, as defined in Section 611.350(a)) according to the procedures in 35 Ill. Adm. Code 186 and appendix B to 40 CFR 136: "Definition and Procedure for the Determination of the Method Detection Limit—Revision 1.11", incorporated by reference in Section 611.102(c). This need only be accomplished if the laboratory will be processing source water composite samples under Section 611.358(a)(1)(D); and

4) Be currently certified to perform analyses to the specifications described in subsection (a)(1).

BOARD NOTE: Subsection (a) is derived from 40 CFR 141.89(a) and (a)(1) ~~(2016)~~.

b) The Agency must, by a SEP, allow a supplier to use previously collected monitoring data for the purposes of monitoring under this Subpart G if the data were collected and analyzed in accordance with the requirements of this Subpart G.

BOARD NOTE: Subsection (b) is derived from 40 CFR 141.89(a)(2) ~~(2016)~~.

c) Reporting Lead ~~lead~~ and Copper Levels ~~copper levels.~~

1) All lead and copper levels greater than or equal to the lead and copper PQL ($\text{Pb} \geq 0.005$ mg/ℓ and $\text{Cu} \geq 0.050$ mg/ℓ) must be reported as measured.

2) All lead and copper levels measured less than the PQL and greater than the MDL (0.005 mg/ℓ $> \text{Pb} > \text{MDL}$ and 0.050 mg/ℓ $> \text{Cu} > \text{MDL}$) must be either reported as measured or as one-half the PQL set forth in subsection (a) (i.e., reported as 0.0025 mg/ℓ for lead or 0.025 mg/ℓ for copper).

3) All lead and copper levels below the lead and copper MDL ($\text{MDL} > \text{Pb}$) must be reported as zero.

BOARD NOTE: Subsection (c) is derived from 40 CFR 141.89(a)(3) and (a)(4) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.360 Reporting

A supplier must report all of the following information to the Agency in accordance with this Section.

a) Reporting for Tap, Lead, ~~tap, lead,~~ and Copper, ~~copper,~~ and Water Quality Parameter Monitoring ~~water quality parameter monitoring.~~

1) Except as provided in subsection (a)(1)(H), a supplier must report the following information for all samples specified in Section 611.356 and for all water quality parameter samples specified in Section 611.357 within ten days after ~~of~~ the end of each applicable sampling period specified in Sections 611.356 and 611.357 (i.e., every six months, annually, every three years, or every nine years). For a monitoring period with a duration less than six months, the end of the monitoring period is the last date on which samples can be collected during that period, as specified in Sections 611.356 and 611.357.

A) The results of all tap samples for lead and copper, including the location of each site and the criteria under Section 611.356(a)(3) through (a)(7) under which the site was selected for the supplier's sampling pool;

B) Documentation for each tap water lead or copper sample for which the water supplier requests invalidation under Section 611.356(f)(2);

C) This subsection (a)(1)(C) corresponds with 40 CFR 141.90(a)(1)(iii), a provision that USEPA removed and marked "reserved". This statement preserves structural parity with the federal rules;

D) The 90th percentile lead and copper concentrations measured from among all lead and copper tap samples collected during each sampling period (calculated in accordance with Section 611.350(c)(3)), unless the Agency calculates the system's 90th percentile lead and copper levels under subsection (h);

E) With the exception of initial tap sampling conducted under Section 611.356(d)(1), the supplier must designate any site that was not sampled during previous sampling periods, and include an explanation of why sampling sites have changed;

F) The results of all tap samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under Section 611.357(b) through (e);

G) The results of all samples collected at entry points for applicable water quality parameters under Section 611.357(b) through (e); and

H) A water supplier must report the results of all water quality parameter samples collected under Section 611.357(c) through (f) during each six-month monitoring period specified in Section 611.357(d) within the first ten ~~10~~ days following the end of the monitoring period, unless the Agency has specified, by a SEP, a more frequent reporting requirement.

2) For a NTNCWS supplier, or a CWS supplier meeting the criteria of Sections 611.355(b)(7)(A) and (b)(7)(B), that does not have enough taps which can provide first-draw samples, the supplier must do either of the following:

A) Provide written documentation to the Agency that identifies standing times and locations for enough non-first-draw samples to make up its sampling pool under Section 611.356(b)(5), unless the Agency has waived prior Agency approval of non-first-draw sampling sites selected by the supplier under ~~pursuant to~~ Section 611.356(b)(5); or

B) If the Agency has waived prior approval of non-first-draw sampling sites selected by the supplier, identify, in writing, each site that did not meet the six-hour minimum standing time and the length of standing time for that particular substitute sample collected under Section 611.356(b)(5) and include this information with the lead and copper tap sample results required to be submitted under subsection (a)(1)(A).

3) At a time specified by the Agency, by a SEP, or if no specific time is designated by the Agency, then as early as possible prior to the addition of

a new source or any change in water treatment, a water supplier deemed to have optimized corrosion control under Section 611.351(b)(3), a water supplier subject to reduced monitoring under Section 611.356(d)(4), or a water supplier subject to a monitoring waiver under Section 611.356(g), must submit written documentation to the Agency describing the change or addition.

4) Any small system supplier applying for a monitoring waiver under Section 611.356(g), or subject to a waiver granted under Section 611.356(g)(3), must provide the following information to the Agency in writing by the specified deadline:

A) By the start of the first applicable monitoring period in Section 611.356(d), any small water system supplier applying for a monitoring waiver must provide the documentation required to demonstrate that it meets the waiver criteria of Sections 611.356(g)(1) and (g)(2).

B) No later than nine years after the monitoring previously conducted under Section 611.356(g)(2) or Section 611.356(g)(4)(A), each small system supplier desiring to maintain its monitoring waiver must provide the information required by Sections 611.356(g)(4)(A) and (g)(4)(B).

C) No later than 60 days after it becomes aware that it is no longer free of lead-containing or copper-containing material, as appropriate, each small system supplier with a monitoring waiver must provide written notification to the Agency, setting forth the circumstances resulting in the lead-containing or copper-containing materials being introduced into the system and what corrective action, if any, the supplier plans to remove these materials.

D) Any small system supplier with a waiver granted prior to April 11, 2000 and that had not previously met the requirements of Section 611.356(g)(2) must have provided the information required by that Section.

5) Each GWS supplier that limits water quality parameter monitoring to a subset of entry points under Section 611.357(c)(3) must provide, by the commencement of such monitoring, written correspondence to the Agency that identifies the selected entry points and includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

b) Reporting for Source Water Monitoring ~~source water monitoring.~~

1) A supplier must report the sampling results for all source water samples collected in accordance with Section 611.358 within ten days after ~~of~~ the

end of each source water sampling period (i.e., annually, per compliance period, per compliance cycle) specified in Section 611.358.

2) With the exception of the first round of source water sampling conducted under Section 611.358(b), a supplier must specify any site that was not sampled during previous sampling periods, and include an explanation of why the sampling point has changed.

c) Reporting for Corrosion Control Treatment ~~corrosion control treatment~~. By the applicable dates under Section 611.351, a supplier must report the following information:

1) For a supplier demonstrating that it has already optimized corrosion control, the information required by Section 611.352(b)(2) or (b)(3).

2) For a supplier required to optimize corrosion control, its recommendation regarding optimal corrosion control treatment under Section 611.352(a).

3) For a supplier required to evaluate the effectiveness of corrosion control treatments under Section 611.352(c), the information required by Section 611.352(c).

4) For a supplier required to install optimal corrosion control approved by the Agency under ~~pursuant to~~ Section 611.352(d), a copy of the Agency permit letter, which acts as certification that the supplier has completed installing the permitted treatment.

d) Reporting for Source Water Treatment ~~source water treatment~~. On or before the applicable dates in Section 611.353, a supplier must provide the following information to the Agency:

1) If required by Section 611.353(b)(1), its recommendation regarding source water treatment; or

2) For suppliers required to install source water treatment under Section 611.353(b)(2), a copy of the Agency permit letter, which acts as certification that the supplier has completed installing the treatment approved by the Agency within 24 months after the Agency approved the treatment.

e) Reporting for Lead Service Line Replacement ~~lead service line replacement~~. A supplier must report the following information to the Agency to demonstrate compliance with the requirements of Section 611.354:

1) No later than 12 months after the end of a monitoring period in which a supplier exceeds the lead action level in sampling referred to in Section 611.354(a), the supplier must submit each of the following to the Agency in writing:

A) The material evaluation conducted as required by Section 611.356(a);

B) Identify the initial number of lead service lines in its distribution system at the time the supplier exceeds the lead action level; and

C) Provide the Agency with the supplier's schedule for annually replacing at least seven percent of the initial number of lead service lines in its distribution system.

2) No later than 12 months after the end of a monitoring period in which a supplier exceeds the lead action level in sampling referred to in Section 611.354(a), and every 12 months thereafter, the supplier must demonstrate to the Agency in writing that the supplier has done either of the following:

A) That the supplier has replaced, in the previous 12 months, at least seven percent of the initial number of lead service lines in its distribution system (or any greater number of lines specified by the Agency under Section 611.354(e)); or

B) That the supplier has conducted sampling that demonstrates that the lead concentration in all service line samples from individual lines, taken under Section 611.356(b)(3), is less than or equal to 0.015 mg/ℓ. This demonstration requires that the total number of lines that the supplier has replaced, combined with the total number that meet the criteria of Section 611.354(c), must equal at least seven percent of the initial number of lead lines identified under ~~pursuant to~~ subsection (e)(1) (or the percentage specified by the Agency under Section 611.354(e)).

3) The annual letter submitted to the Agency under subsection (e)(2) must contain the following information:

A) The number of lead service lines originally scheduled to be replaced during the previous year of the supplier's replacement schedule;

B) The number and location of each lead service line actually replaced during the previous year of the supplier's replacement schedule; and

C) If measured, the water lead concentration from each lead service line sampled under Section 611.356(b)(3) and the location of each lead service line sampled, the sampling method used, and the date of sampling.

4) Any supplier that collects lead service line samples following partial lead service line replacement required by Section 611.354 must report the

results to the Agency within the first ten days after the month following the month in which the supplier receives the laboratory results, or as specified by the Agency. The Agency may, by a SEP, eliminate this requirement to report these monitoring results. A supplier must also report any additional information as specified by the Agency, and in a time and manner prescribed by the Agency, to verify that all partial lead service line replacement activities have taken place.

f) Reporting for Public Education Program ~~public education program.~~

1) Any water supplier that is subject to the public education requirements in Section 611.355 must, within ten days after the end of each period in which the supplier is required to perform public education in accordance with Section 611.355(b), send written documentation to the Agency that contains the following:

A) A demonstration that the supplier has delivered the public education materials that meet the content requirements in Sections 611.355(a) and the delivery requirements in Section 611.355(b); and

B) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the supplier delivered public education materials during the period in which the supplier was required to perform public education tasks.

2) Unless required by the Agency, by a SEP, a supplier that previously has submitted the information required by subsection (f)(1)(B) need not resubmit the information required by subsection (f)(1)(B), as long as there have been no changes in the distribution list and the supplier certifies that the public education materials were distributed to the same list submitted previously.

3) No later than three months following the end of the monitoring period, each supplier must mail a sample copy of the consumer notification of tap results to the Agency, along with a certification that the notification has been distributed in a manner consistent with the requirements of Section 611.355(d).

g) Reporting of Additional Monitoring Data ~~additional monitoring data~~. Any supplier that collects sampling data in addition to that required by this Subpart G must report the results of that sampling to the Agency within the first ten days following the end of the applicable sampling periods specified by Sections 611.356 through 611.358 during which the samples are collected.

h) Reporting of 90th Percentile Lead ~~percentile lead~~ and Copper Concentrations Where ~~copper concentrations where~~ the Agency Calculates ~~calculates~~ a System's ~~system's~~ 90th Percentile Concentrations ~~percentile concentrations~~. A water supplier is not required to report the 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period, as required by subsection (a)(1)(D) if the following is true:

1) The Agency has previously notified the water supplier that it will calculate the water system's 90th percentile lead and copper concentrations, based on the lead and copper tap results submitted under subsection (h)(2)(A), and has specified a date before the end of the applicable monitoring period by which the supplier must provide the results of lead and copper tap water samples;

2) The supplier has provided the following information to the Agency by the date specified in subsection (h)(1):

   A) The results of all tap samples for lead and copper including the location of each site and the criteria under Section 611.356(a)(3), (a)(4), (a)(5), (a)(6), or (a)(7) under which the site was selected for the system's sampling pool, under subsection (a)(1)(A); and

   B) An identification of sampling sites utilized during the current monitoring period that were not sampled during previous monitoring periods, and an explanation why sampling sites have changed; and

3) The Agency has provided the results of the 90th percentile lead and copper calculations, in writing, to the water supplier before the end of the monitoring period.

BOARD NOTE: Derived from 40 CFR 141.90~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART I: DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS

Section 611.380 General Requirements

a) The Requirements ~~requirements~~ of This ~~this~~ Subpart I Constitute ~~constitute~~ NPDWRs~~.~~

   1) The regulations in this Subpart I establish standards under which a CWS supplier or an NTNCWS supplier that adds a chemical disinfectant to the water in any part of the drinking water treatment process must modify its practices to meet MCLs and MRDLs in Sections 611.312 and 611.313, respectively, and must meet the treatment technique requirements for DBP precursors in Section 611.385.

2) The regulations in this Subpart I establish standards under which a transient non-CWS supplier that uses chlorine dioxide as a disinfectant or oxidant must modify its practices to meet the MRDL for chlorine dioxide in Section 611.313.

3) The Board has established MCLs for TTHM and HAA5 and treatment technique requirements for DBP precursors to limit the levels of known and unknown DBPs that may have adverse health effects. These DBPs may include chloroform, bromodichloromethane, dibromochloromethane, bromoform, dichloroacetic acid, and trichloroacetic acid.

b) This subsection (b) corresponds with 40 CFR 141.130(b), which recites past implementation deadlines. This statement maintains structural consistency with the corresponding federal rules.

c) Each CWS or NTNCWS supplier regulated under subsection (a) must be operated by qualified personnel who meet the requirements specified in 35 Ill. Adm. Code 680.

d) Control of Disinfectant Residuals ~~disinfectant residuals~~. Notwithstanding the MRDLs in Section 611.313, a supplier may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

BOARD NOTE: Derived from 40 CFR 141.130 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.381 Analytical Requirements

a) A supplier must use only the analytical methods specified in this Section, each of which is incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480 to demonstrate compliance with the requirements of this Subpart I and with the requirements of Subparts W and Y.

b) Disinfection Byproducts ~~byproducts~~ (DBPs)~~.~~

1) A supplier must measure disinfection byproducts (DBPs) by the appropriate of the following methods:

A) TTHM~~.~~

i) By Purge ~~purge~~ and Trap ~~trap~~, Gas Chromatography ~~gas chromatography~~, Electrolytic Conductivity Detector ~~electrolytic conductivity detector~~, and Photoionization

Detector. ~~photoionization detector:~~ USEPA ~~Organic Methods, Method~~ 502.2 (95) ~~(rev. 2.1)~~. If TTHMs are the only analytes being measured in the sample, then a photoionization detector is not required.

ii) By Purge ~~purge~~ and Trap ~~trap~~, Gas Chromatography-Mass Spectrometer. ~~gas chromatography-mass spectrometer:~~ USEPA ~~Organic Methods, Method~~ 524.2 (95) or USEPA 524.3 (09), or USEPA 524.4 (13) ~~(rev. 4.1)~~.

iii) By Liquid-Liquid Extraction, Gas Chromatography, Electron Capture Detector. ~~liquid-liquid extraction, gas chromatography, electron capture detector:~~ USEPA ~~Organic Methods, Method~~ 551.1 (95) ~~(rev. 1.0)~~.

~~iv) By purge and trap, gas chromatography-mass spectrometry: USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4.~~

~~BOARD NOTE: USEPA added USEPA OGWDW Methods, Method 524.3 (rev. 1.0) as an approved alternative method on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added USEPA OGWDW Methods, Method 524.4 as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558).~~

B) HAA5~~:~~

i) Liquid-Liquid Extraction (Diazomethane), Gas Chromatography, Electron Capture Detector. ~~By liquid-liquid extraction (diazomethane), gas chromatography, electron capture detector:~~ SM ~~Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 6251 B (94) or SM 6251 B (07).

ii) Solid Phase Extractor (Acidic Methanol), Gas Chromatography, Electron Capture Detector. ~~By solid phase extractor (acidic methanol), gas chromatography, electron capture detector:~~ USEPA ~~Organic Methods, Method~~ 552.1 (92) ~~(rev. 1.0)~~.

iii) Liquid-Liquid Extraction (Acidic Methanol), Gas Chromatography, Electron Capture Detector. ~~By liquid-liquid extraction (acidic methanol), gas chromatography, electron capture detector:~~ USEPA ~~Organic Methods, Method~~ 552.2 (95) ~~(rev. 1.0)~~ or ~~USEPA OGWDW Methods, Method~~ 552.3 (03) ~~(rev. 1.0)~~.

iv) Ion Chromatography, Electrospray Ionization, Tandem

Mass Spectrometry. ~~By ion chromatography, electrospray ionization, tandem mass spectrometry:~~ USEPA ~~OGWDW Methods, Method~~ 557 (09).

v) Two-Dimensional Ion Chromatography (IC) with Suppressed Conductivity Detection. ~~Two-dimensional ion chromatography (IC) with suppressed conductivity detection:~~ Thermo-Fisher ~~Method~~ 557.1 (17).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 6251 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA OGWDW Methods, Method 557 as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Method 6251 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 6251 B-07 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added Thermo-Fisher Method 557.1 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 6251 B is the same version as Standard Methods Online, Method 6251 B-07, the Board has not listed the Standard Methods Online versions separately.~~

C) Bromate~~:~~

i) Ion Chromatography. ASTM D6581-00 or ~~By ion chromatography:~~ USEPA ~~Organic and Inorganic Methods, Method~~ 300.1 (97) ~~(rev. 1.0) or ASTM Method D6581-00~~.

ii) Ion Chromatography and Post-Column Reaction. ~~By ion chromatography and post-column reaction:~~ USEPA ~~OGWDW Methods, Method~~ 317.0 (01) ~~(rev. 2.0)~~ or USEPA 326.0 (02) ~~(rev. 1.0)~~.

iii) Inductively Coupled Plasma-Mass Spectrometer. ~~By inductively coupled plasma-mass spectrometer:~~ USEPA ~~Organic and Inorganic Methods, Method~~ 321.8 (97) ~~(rev. 1.0)~~.

iv) Two-Dimensional Ion Chromatography. ~~By two-dimensional ion chromatography:~~ USEPA ~~OGWDW Methods, Method~~ 302.0 (09).

v) Ion Chromatography, Electrospray Ionization, Tandem Mass Spectrometry. ~~By ion chromatography, electrospray ionization, tandem mass spectrometry:~~ USEPA ~~OGWDW~~

~~Methods, Method~~ 557 (09).

vi) Chemically Suppressed Chromatography. ~~By chemically suppressed chromatography:~~ ASTM ~~Method~~ D6581-08 A.

vii) Electrolytically Suppressed Chromatography. ~~By electrolytically suppressed chromatography:~~ ASTM ~~Method~~ D6581-08 B.

BOARD NOTE: Ion chromatography and post column reaction or inductively coupled plasma-mass spectrometry must be used for monitoring of bromate for purposes of demonstrating eligibility of reduced monitoring, as prescribed in Section 611.382(b)(3)(B). For inductively coupled plasma-mass spectrometry, samples must be preserved at the time of sampling with 50 mg ethylenediamine (EDA) per liter of sample, and the samples must be analyzed within 28 days.

~~BOARD NOTE: USEPA added USEPA OGWDW Methods, Methods 302.0 and 557 and ASTM Methods D6581-08 A and B as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908).~~

D) Chlorite~~:~~

i) Amperometric Titration ~~By amperometric titration~~ for Daily Monitoring Under ~~daily monitoring under~~ Section 611.382(b)(2)(A)(i). SM ~~: Standard Methods, 19th, 21st, or 22nd ed., Method~~ 4500-ClO_2 E (93) or 4500-ClO_2 E (00).

ii) Amperometric Sensor ~~By amperometric sensor~~ for Daily Monitoring Under ~~daily monitoring under~~ Section 611.382(b)(2)(A)(i).~~:~~ Palintest ChlordioX Plus (13) ~~Test~~.

iii) Spectrophotometry. ~~By spectrophotometry:~~ USEPA ~~OGWDW Methods, Method~~ 327.0 (05) ~~(rev. 1.1)~~.

iv) Ion Chromatography. ~~By ion chromatography:~~ USEPA Environmental Inorganic Methods, Method 300.0 (09), ~~(rev. 2.1);~~ USEPA ~~Organic and Inorganic Methods, Method~~ 300.1 (97), ~~(rev. 1.0);~~ USEPA ~~OGWDW Methods, Method~~ 317.0 (01) ~~(rev. 2.0)~~, USEPA ~~or~~ 326.0 (02), ~~(rev. 1.0);~~ or ASTM ~~Method~~ D6581-00.

v) Chemically Suppressed Chromatography. ~~By chemically suppressed chromatography:~~ ASTM ~~Method~~ D6581-08 A.

vi) Electrolytically Suppressed Chromatography. ~~By electrolytically suppressed chromatography:~~ ASTM ~~Method~~ D6581-08 B.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 4500-ClO_2 E as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D6581-08 A and B as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Method 4500-ClO_2 E as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added ChlordioX Plus Test as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081).~~

BOARD NOTE: Amperometric titration or spectrophotometry may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in Section 611.382(b)(2)(A)(i). Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in Section 611.382(b)(2)(A)(ii) and (b)(2)(B).

2) Analyses under this Section for DBPs must be conducted by a certified laboratory in one of the categories listed in Section 611.490(a) except as specified under subsection (b)(3). To receive certification to conduct analyses for the DBP contaminants listed in Sections 611.312 and 611.381 and Subparts W and Y, the laboratory must fulfill the requirements of subsections (b)(2)(A), (b)(2)(C), and (b)(2)(D).

A) The laboratory must analyze performance evaluation (PE) samples that are acceptable to USEPA or the Agency at least once during each consecutive 12-month period by each method for which the laboratory desires certification.

B) This subsection corresponds with 40 CFR 141.131(b)(2)(ii), which has expired by its own terms. This statement maintains structural consistency with the corresponding federal rule.

C) The laboratory must achieve quantitative results on the PE sample analyses that are within the acceptance limits set forth in subsections (b)(2)(C)(i) through (b)(2)(B)(xi), subject to the conditions of subsections (b)(2)(C)(xii) and (b)(2)(C)(xiii):

i) Chloroform (a THM): ±20% of true value;

ii) Bromodichloromethane (a THM): ±20% of true value;

iii) Dibromochloromethane (a THM): ±20% of true value;

iv) Bromoform (a THM): ±20% of true value;

v) Monochloroacetic Acid (an HAA5): ±40% of true value;

vi) Dichloroacetic Acid (an HAA5): ±40% of true value;

vii) Trichloroacetic Acid (an HAA5): ±40% of true value;

viii) Monobromoacetic Acid (an HAA5): ±40% of true value;

ix) Dibromoacetic Acid (an HAA5): ±40% of true value;

x) Chlorite: ±30% of true value; and

xi) Bromate: ±30% of true value.

xii) The laboratory must meet all four of the individual THM acceptance limits set forth in subsections (b)(2)(B)(i) through (b)(2)(B)(iv) in order to successfully pass a PE sample for TTHM.

xiii) The laboratory must meet the acceptance limits for four out of the five HAA5 compounds set forth in subsections (b)(2)(B)(v) through (b)(2)(B)(ix) in order to successfully pass a PE sample for HAA5.

D) The laboratory must report quantitative data for concentrations at least as low as the minimum reporting levels (MRLs) listed in subsections (b)(2)(D)(i) through (b)(2)(D)(xi), subject to the limitations of subsections (b)(2)(D)(xii) and (b)(2)(D)(xiii), for all DBP samples analyzed for compliance with Sections 611.312 and 611.385 and Subparts W and Y:

i) Chloroform (a THM): 0.0010 mg/ℓ;

ii) Bromodichloromethane (a THM): 0.0010 mg/ℓ;

iii) Dibromochloromethane (a THM): 0.0010 mg/ℓ;

iv) Bromoform (a THM): 0.0010 mg/ℓ;

v) Monochloroacetic Acid (an HAA5): 0.0020 mg/ℓ;

vi) Dichloroacetic Acid (an HAA5): 0.0010 mg/ℓ;

vii) Trichloroacetic Acid (an HAA5): 0.0010 mg/ℓ;

viii) Monobromoacetic Acid (an HAA5): 0.0010 mg/ℓ;

ix) Dibromoacetic Acid (an HAA5): 0.0010 mg/ℓ;

x) Chlorite: 0.020 mg/ℓ, applicable to monitoring as required by Section 611.382(b)(2)(A)(ii) and (b)(2)(B); and

xi) Bromate: 0.0050, or 0.0010 mg/ℓ if the laboratory uses USEPA ~~OGWDW Methods, Method~~ 317.0 (01), USEPA 321.8 (97), or USEPA 326.0 (02) ~~or USEPA 321.8~~.

xii) The calibration curve must encompass the regulatory MRL concentration. Data may be reported for concentrations lower than the regulatory MRL as long as the precision and accuracy criteria are met by analyzing an MRL check standard at the lowest reporting limit chosen by the laboratory. The laboratory must verify the accuracy of the calibration curve at the MRL concentration by analyzing an MRL check standard with a concentration less than or equal to 110% of the MRL with each batch of samples. The measured concentration for the MRL check standard must be ±50% of the expected value, if any field sample in the batch has a concentration less than five times the regulatory MRL. Method requirements to analyze higher concentration check standards and meet tighter acceptance criteria for them must be met in addition to the MRL check standard requirement.

xiii) When adding the individual trihalomethane or haloacetic acid concentrations, for the compounds listed in subsections (b)(2)(D)(v) through (b)(2)(D)(ix), to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical result that is less than the MRL concentration for that DBP, unless otherwise specified by the Agency.

3) A party approved by USEPA or the Agency must measure daily chlorite samples at the entrance to the distribution system.

c) Disinfectant Residuals ~~residuals.~~

1) A supplier must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the appropriate of the methods listed in subsections (c)(1)(A) through (c)(1)(D), subject to the provisions of subsection (c)(1)(E):

A) Free Chlorine~~:~~

i) Amperometric Titration. ASTM D1253-86, ASTM D1253-96, ASTM D 1253-03, ASTM D1253-08, ASTM D1253-

14, SM ~~titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl D (93), or SM 4500-Cl D (00). ~~or ASTM Method D1253-86, D1253-96, D1253-03, D1253-08, or D1253-14;~~

ii) DPD Ferrous Titration. SM ~~ferrous titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl F (93) or SM 4500-Cl F (00).~~;~~

iii) DPD Colorimetric. ~~colorimetric:~~ Hach 10260 (13), SM ~~Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl G (93), or SM 4500-Cl G (00). ~~or Hach Method 10260;~~

iv) Syringaldazine (FACTS).~~:~~ SM ~~Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl H (93) or SM 4500-Cl H (00).~~;~~

v) Test Strips. ~~strips:~~ ITS ~~Method~~ D99-003 (03) if approved by the Agency under subsection (c)(2).~~;~~

vi) Amperometric Sensor. ~~sensor:~~ Palintest ChloroSense (09).~~;~~

vii) On-Line Chlorine Analyzer. ~~On-line chlorine analyzer:~~ USEPA ~~OGWDW Methods, Method~~ 334.0 (09).~~; or~~

viii) Indenophenol Colorimetric. ~~colorimetric:~~ Hach ~~Method~~ 10241 (15).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-Cl D, F, G, and H as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D1253-08, USEPA OGWDW Methods, Method 334.0, and Palintest ChloroSense as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 4500-Cl D, F, G, and H as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10260 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D1253-14 and Hach Method 10241 as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839).~~

B) Combined Chlorine~~:~~

i) Amperometric Titration. ASTM D1253-86, ASTM D1253-96, ASTM D1253-03, ASTM D1253-08, or ASTM D1253-

14, SM ~~titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl D (93), or SM 4500-CL D (00).~~, or ASTM Method D1253-86, ASTM D1253-96, ASTM D1253-03, ASTM D1253-08, ASTM D1253-14;~~

ii) DPD Ferrous Titration. SM ~~ferrous titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl F (93) or SM 4500-Cl F (00).~~; or~~

iii) DPD Colorimetric. Hach 10260 (13), SM ~~colorimetric: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl G (93), or SM 4500-Cl G (00) ~~or Hach Method 10260~~.

~~BOARD NOTE: USEPA added Standard Methods, Methods 4500-Cl D, F, and G as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D1253-08 as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 4500-Cl D, F, and G as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10260 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D1253-14 as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

C) Total Chlorine~~:~~

i) Amperometric Titration: ASTM D1253-86, ASTM D1253-96, ASTM D1253-03, ASTM D1253-08, or ASTM D1253-14, SM ~~titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl D (93), or SM 4500-Cl D (00).~~, or ASTM Method D1253-86, D1253-96, D1253-03, D1253-08, or D1253-14;~~

ii) Low-Level Amperometric Titration. SM ~~Low-level amperometric titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl E (93) or SM 4500-Cl E (00).~~;~~

iii) DPD Ferrous Titration. SM ~~ferrous titration: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl F (93) or SM 4500-Cl F (00).~~;~~

iv) DPD Colorimetric. Hach 10260 (13), SM ~~colorimetric: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl G (93), or SM 4500-Cl G (00). ~~or Hach Method 10260;~~

v) Iodometric Electrode. ~~electrode:~~ SM ~~Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl I (93) or SM 4500-Cl I (00).~~;~~

vi) Amperometric Sensor. ~~sensor:~~ Palintest ChloroSense (09).~~; or~~

vii) On-Line Chlorine Analyzer. ~~On-line chlorine analyzer:~~ USEPA ~~OGWDW Methods, Method~~ 334.0 (09).

~~BOARD NOTE USEPA added Standard Methods, Methods 4500-Cl D, E, F, G, and I as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D1253-08, USEPA OGWDW Methods, Method 334.0, and Palintest ChloroSense as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 4500-Cl D, E, F, G, and I as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10260 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D1253-14 as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

D) Chlorine Dioxide~~:~~

i) DPD.~~:~~ SM ~~Standard Methods, 19th, 20th, or 21st ed., Method~~ 4500-ClO$_2$ D (93) or SM 4500-ClO$_2$ D (00).~~;~~

ii) Amperometric Method II.~~:~~ SM ~~Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-ClO$_2$ E (93) or SM 4500-ClO$_2$ E (00).~~;~~

iii) Amperometric Sensor. ~~sensor:~~ ChlordioX Plus (13). ~~Test; or~~

iv) Lissamine Green Spectrophotometric. ~~spectrophotometric:~~ USEPA ~~OGWDW Method~~ 327.0 (05) ~~(rev. 1.1)~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-ClO$_2$ D and E as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 4500-ClO$_2$ E as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added ChlordioX Plus Test as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081).~~

E) The methods listed are approved for measuring the specified disinfectant residual. The supplier may measure free chlorine or total chlorine for demonstrating compliance with the chlorine MRDL and combined chlorine, or total chlorine may be measured for demonstrating compliance with the chloramine MRDL.

2) Alternative Methods Available Only ~~methods available only~~ upon Specific Approval ~~specific approval~~ by the Agency~~.~~

A) Test Strips. ~~strips:~~ ITS Method D99-003 (03).

BOARD NOTE: USEPA added ITS Method D99-003 (03) as an approved alternative method ~~on June 3, 2008 (at 73 Fed. Reg. 31616),~~ contingent upon specific State ~~state~~ approval. The Board has opted to provide that the Agency can grant such approvals on a case-by-case basis using the SEP mechanism.

B) If approved by the Agency, by an SEP, a supplier may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

3) A party approved by USEPA or the Agency must measure residual disinfectant concentration.

d) A supplier required to analyze parameters not included in subsections (b) and (c) must use the methods listed in this subsection (d) ~~below~~. A party approved by USEPA or the Agency must measure the following parameters:

1) Alkalinity. All methods allowed in Section 611.611(a)(21) for measuring alkalinity.

2) Bromide. Ion Chromatography. ASTM D6581-00, USEPA 300.0 (93), USEPA 300.1 (97), USEPA 317.0 (01), or USEPA 326.0 (02).~~:~~

~~A) USEPA Inorganic Methods, Method 300.0 (rev. 2.1);~~

~~B) USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0);~~

~~C) USEPA OGWDW Methods, Method 317.0 (rev. 2.0) or Method 326.0 (rev. 1.0); or~~

~~D) ASTM Method D6581-00.~~

3) Total Organic Carbon (TOC), by any of the methods listed in subsection (d)(3)(A) ~~(d)(3)(A)(i), (d)(3)(A)(ii), (d)(3)(A)(iii), or (d)(3)(B)~~, subject to the limitations of subsection (d)(3)(B). ~~(d)(3)(C)~~:

A) Analytical Methods~~High-temperature combustion:~~

i) High-Temperature Combustion. SM ~~Standard Methods,~~

~~19th (Supplement), 20th, 21st, or 22nd ed., Method~~ 5310 B (92), SM 5310 B (96), SM 5310 B (00), SM 5310 B (14), USEPA 415.3 (05),~~;~~ or USEPA 415.3 (09).

ii) Persulfate-Ultraviolet or Heated-Persulfate Oxidation. Hach 10267, (15) SM 5310 C (92), SM 5310 C (96), SM 5310 C (00), SM 5310 C (14), USEPA ~~NERL Method~~ 415.3 (05), ~~(rev. 1.1)~~ or USEPA ~~NERL Method~~ 415.3 (09) ~~(rev. 1.2)~~.

~~B) Persulfate-ultraviolet or heated-persulfate oxidation:~~

~~i) Standard Methods, 19th (Supplement), 20th, 21st, or 22nd ed., Method 5310 C; or~~

~~ii) USEPA NERL Method 415.3 (rev. 1.1) or USEPA NERL Method 415.3 (rev. 1.2); or~~

~~iii) Hach Method 10267.~~

iii~~C~~) Wet Oxidation Method. SM 5310 D (92), SM 5310 D (96), SM 5310 D (00), SM 5310 D (14), USEPA 415.3 (05), or USEPA 415.3 (09). ~~oxidation method:~~

~~i) Standard Methods, 19th (Supplement), 20th, 21st, or 22nd ed., Method 5310 D; or~~

~~ii) USEPA NERL Method 415.3 (rev. 1.1) or USEPA NERL Method 415.3 (rev. 1.2).~~

iv~~D~~) Ozone Oxidation. ~~oxidation:~~ Hach ~~Method~~ 10261 (15).

B~~E~~) Inorganic carbon must be removed from the samples prior to analysis. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within 28 days.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 5310 B, C, and D as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 5310 B, C, and D as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10267 as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

4) Specific Ultraviolet Absorbance (SUVA). SUVA is equal to the UV absorption at 254 nm (UV$_{254}$) (measured in m^{-1}) divided by the dissolved organic carbon (DOC) concentration (measured as mg/ℓ). In order to determine SUVA, it is necessary to separately measure UV$_{254}$ and DOC. When determining SUVA, a supplier must use the methods stipulated in subsection (d)(4)(A) to measure DOC and the method stipulated in subsection (d)(4)(B) to measure UV$_{254}$. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the supplier. DOC and UV$_{254}$ samples used to determine a SUVA value must be taken at the same time and at the same location.

A) Dissolved Organic Carbon (DOC). Prior to analysis, DOC samples must be filtered through the 0.45 µm pore-diameter filter as soon as practical after sampling, not to exceed 48 hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within 28 days after sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following standards: DOC less than 0.5 mg/ℓ.

i) High-Temperature Combustion Method.~~:~~ SM ~~Standard Methods, 19th (Supplement), 20th, 21st, or 22nd ed., Method~~ 5310 B (92), SM 5310 B (96), SM 5310 B (00), SM 5310 B (14), ~~or~~ USEPA ~~NERL Method~~ 415.3 (05), ~~(rev. 1.1)~~ or USEPA ~~NERL Method~~ 415.3 (09) ~~(rev. 1.2)~~.

ii) Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method. SM~~, Standard Methods, 19th (Supplement), 20th, 21st, or 22nd ed., Method~~ 5310 C (92), SM 5310 C (96), SM 5310 C (00), SM 5310 C (14), ~~or~~ USEPA ~~NERL Methods~~ 415.3 (05), or USEPA 415.3 (09) ~~(rev. 1.1) or 415.3 (rev. 1.2)~~.

iii) Wet-Oxidation Method.~~:~~ SM ~~Standard Methods, 19th (Supplement), 20th, 21st, or 22nd ed., Method~~ 5310 D (92), (96), SM 5310 D (00), ~~or~~ USEPA ~~NERL Method~~ 415.3 (05), ~~(rev. 1.1)~~ or USEPA ~~NERL Method~~ 415.3 (09) ~~(rev. 1.2)~~.

~~BOARD NOTE: USEPA added Standard Methods, Methods 5310 B, C, and D as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method on November 10,~~

~~2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 5310 B, C, and D as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

B) Ultraviolet Absorption at 254 nm (UV_{254}) by Spectrometry. SM ~~spectrometry: Standard Methods, 19th, 20th, 21st, or 22nd ed., Method~~ 5910 B (94), SM 5910 B (00), 5910 B (11), 5910 B (13), ~~or~~ USEPA ~~NERL Method~~ 415.3 (05), ~~(rev. 1.1)~~ or USEPA ~~NERL Method~~ 415.3 (09) ~~(rev. 1.2)~~. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 μm pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.~~; and~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 5910 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Method 5910 B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Method 5910 B-11 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Methods 5910 B is the same version as Standard Methods Online, Method 5910 B-11, the Board has not listed the Standard Methods Online versions separately.~~

5) pH. All methods allowed in Section 611.611(a)(17) for measuring pH.

6) Magnesium. All methods allowed in Section 611.611(a) for measuring magnesium.

BOARD NOTE: Derived from 40 CFR 141.131 and appendix A to 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Methods 4500-Cl D-93, 4500-Cl E-93, 4500-Cl F-93, 4500-Cl G-93, 4500-Cl H-93, and 4500-Cl I-93 appear in the 19th and 20th editions as Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, and 4500-Cl I. In this Section, these appear as SM 4500-Cl D (93), SM 4500-Cl E (93), SM 4500-Cl F (93), SM 4500-Cl G (93), SM 4500-Cl H (93), and SM 4500-Cl I (93).

Standard Methods Online, Methods 4500-Cl D-00, 4500-Cl E-00, 4500-Cl F-00, 4500-Cl G-00, 4500-Cl H-00, and 4500-Cl I-00 appear in the 21st, 22nd, and 23rd editions as

Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, and 4500-Cl I. In this Section, these appear as SM 4500-Cl D (00), 4500-Cl E (00), 4500-Cl F (00), 4500-Cl G (00), 4500-Cl H (00), and 4500-Cl I (00).

Standard Methods Online, Methods 4500-ClO_2 D-93 and 4500-ClO_2 E-93 appear in the 19th and 20th editions as Methods 4500-ClO_2 D and 4500-ClO_2 E. In this Section, these appear as SM 4500-ClO_2 D (93) and SM 4500-ClO_2 E (93).

Standard Methods Online, Methods 4500-ClO_2 D-00 and 4500-ClO_2 E-00 appear in the 21st, 22nd, and 23rd editions as Methods 4500-ClO_2 D and 4500-ClO_2 E. In this Section, these appear as SM 4500-ClO_2 D (00) and SM 4500-ClO_2 E (00).

Standard Methods Online, Methods 5310 B-00, 5310 C-00, and 5310 D-00 appear in the 21st and 22nd editions as Methods 5310 B, 5310 C, and 5310 D. In this Section, these appear as SM 5310 B (00), SM 5310 C (00), and SM 5310 D (00).

Standard Methods Online, Method 5910 B-00 appears in the 21st edition as Method 5910 B. In this Section, this appears as SM 5910 B (00).

Standard Methods Online, Method 5910 B-11 appears in the 22nd edition as Method 5910 B. In this Section, this appears as SM 5910 B (11).

Standard Methods Online, Method 6251 B-94 appears in the 19th, 20th, and 21st editions as Method 6251 B. In this Section, this appears as SM 6251 B (94).

Standard Methods Online, Method 6251 B-07 appears in the 22nd and 23rd editions as Method 5910 B. In this Section, this appears as SM 6251 B (07).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.382 Monitoring Requirements

a) General Requirements ~~requirements.~~

1) A supplier must take all samples during normal operating conditions.

2) A supplier may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required with Agency approval.

3) Failure to monitor in accordance with the monitoring plan required under subsection (f) is a monitoring violation.

4) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the supplier's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs, this failure to monitor will be treated as a violation for the entire period covered by the annual average.

5) A supplier must use only data collected under the provisions of this Subpart I to qualify for reduced monitoring.

b) Monitoring Requirements ~~requirements~~ for Disinfection Byproducts ~~disinfection byproducts~~ (DBPs)~~.~~

1) TTHMs and HAA5~~.~~

A) Routine Monitoring ~~monitoring~~. A supplier must monitor at the following frequency:

i) A Subpart B system supplier that serves 10,000 or more persons must collect four water samples per quarter per treatment plant. At least 25 percent of all samples collected each quarter must be collected at locations representing maximum residence time. The remaining samples may be taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account the number of persons served, the different sources of water, and the different treatment methods.

ii) A Subpart B system supplier that serves from 500 to 9,999 persons must collect one water sample per quarter per treatment plant. The samples must be collected from locations representing maximum residence time.

iii) A Subpart B system supplier that serves fewer than 500 persons must collect one sample per year per treatment plant during month of warmest water temperature. The samples must be collected from locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds the MCL, the supplier must increase the monitoring frequency to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the supplier meets the standards in subsection (b)(1)(D).

iv) A supplier that uses only groundwater not under direct influence of surface water, which uses chemical disinfectant, and which serves 10,000 or more persons must collect one water sample per quarter per treatment plant. The samples must be collected from locations representing maximum residence time.

v) A supplier that uses only groundwater not under direct influence of surface water, which uses chemical disinfectant, and which serves fewer than 10,000 persons must collect one sample per year per treatment plant during month of warmest water temperature. The samples must be collected from locations representing maximum residence time. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, the supplier must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until the supplier meets standards in subsection (b)(1)(D).

BOARD NOTE: If a supplier elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system. For a supplier using groundwater not under the direct influence of surface water, multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with Agency approval.

B) A supplier may reduce monitoring, except as otherwise provided, in accordance with the following:

i) A Subpart B system supplier that serves 10,000 or more persons and which has a source water annual average TOC level, before any treatment, of less than or equal to 4.0 mg/ℓ may reduce monitoring if it has monitored for at least one year and its TTHM annual average is less than or equal to 0.040 mg/ℓ and HAA5 annual average is less than or equal to 0.030 mg/ℓ. The reduced monitoring allowed is a minimum of one sample per treatment plant per quarter at a distribution system location reflecting maximum residence time.

ii) A Subpart B system supplier that serves from 500 to 9,999 persons and which has a source water annual average TOC level, before any treatment, of less than or equal to 4.0 mg/ℓ may reduce monitoring if it has monitored at least one year and its TTHM annual average is less than or equal to 0.040 mg/ℓ and HAA5 annual average is less than or equal to 0.030 mg/ℓ. The reduced monitoring allowed is a minimum of one sample per treatment plant per year at a distribution system location reflecting maximum residence time during month of warmest water temperature.

BOARD NOTE: Any Subpart B system supplier that serves fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

iii) A supplier using only groundwater not under direct influence of surface water using chemical disinfectant and that serves 10,000 or more persons may reduce monitoring if it has monitored at least one year and its TTHM annual average is less than or equal to 0.040 mg/ℓ and HAA5 annual average is less than or equal to 0.030 mg/ℓ. The reduced monitoring allowed is a minimum of one sample per treatment plant per year at a distribution system location reflecting maximum residence time during month of warmest water temperature.

iv) A supplier using only groundwater not under direct influence of surface water that uses chemical disinfectant and which serves fewer than 10,000 persons may reduce monitoring if it has monitored at least one year and its TTHM annual average is less than or equal to 0.040 mg/ℓ and HAA5 annual average is less than or equal to 0.030 mg/ℓ for two consecutive years or TTHM annual average is less than or equal to 0.020 mg/ℓ and HAA5 annual average is less than or equal to 0.015 mg/ℓ for one year. The reduced monitoring allowed is a minimum of one sample per treatment plant per three year monitoring cycle at a distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following the quarter in which the supplier qualifies for reduced monitoring.

C) Monitoring Requirements ~~requirements~~ for Source Water ~~source water~~ TOC. In order to qualify for reduced monitoring for TTHM and HAA5 under subsection (b)(1)(B), a Subpart B system supplier not monitoring under the provisions of subsection (d) must take monthly TOC samples every 30 days at a location prior to any treatment. In addition to meeting other criteria for reduced monitoring in subsection (b)(1)(B), the source water TOC running annual average must be ≤4.0 mg/ℓ (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under subsection (b)(1)(B), a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

D) A Subpart B system supplier on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for a supplier that must monitor quarterly) or the result of the sample (for a supplier that must monitor no more frequently than annually) is no more than 0.060 mg/ℓ and 0.045 mg/ℓ for TTHMs and HAA5, respectively. A supplier that does not meet these levels must resume monitoring at the frequency identified in subsection (b)(1)(A) in the quarter immediately following the monitoring period in which the supplier exceeds 0.060 mg/ℓ for TTHMs or 0.045 mg/ℓ for HAA5. For a supplier that uses only groundwater not under the direct influence of surface water and which serves fewer than 10,000 persons, if either the TTHM annual average is greater than 0.080 mg/ℓ or the HAA5 annual average is greater than 0.060 mg/ℓ, the supplier must go to increased monitoring identified in subsection (b)(1)(A) in the quarter immediately following the monitoring period in which the supplier exceeds 0.080 mg/ℓ for TTHMs or 0.060 mg/ℓ for HAA5.

E) The Agency may return a supplier to routine monitoring.

2) Chlorite. A CWS or NTNCWS supplier using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

A) Routine Monitoring ~~monitoring.~~

i) Daily Monitoring ~~monitoring~~. A supplier must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the supplier must take additional samples in the distribution system the following day at the locations required by subsection (b)(2)(B), in addition to the sample required at the entrance to the distribution system.

ii) Monthly Monitoring ~~monitoring~~. A supplier must take a three-sample set each month in the distribution system. The supplier must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The supplier may use the results of additional monitoring conducted under subsection (b)(2)(B) to meet the requirement for monitoring in this subsection (b)(2)(A)(ii).

B) Additional Monitoring ~~monitoring~~. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the supplier must take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

C) Reduced Monitoring ~~monitoring.~~

i) Chlorite monitoring at the entrance to the distribution system required by subsection (b)(2)(A)(i) may not be reduced.

ii) Chlorite monitoring in the distribution system required by subsection (b)(2)(A)(ii) may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under subsection (b)(2)(A)(ii) has exceeded the chlorite MCL and the supplier has not been required to conduct monitoring under subsection (b)(2)(B). The supplier may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under subsection (b)(2)(A)(ii) exceeds the chlorite MCL or the supplier is required to conduct monitoring under subsection (b)(2)(B), at which time the supplier must revert to routine monitoring.

3) Bromate~~.~~

A) Routine Monitoring ~~monitoring~~. A CWS or NTNCWS supplier using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. A supplier must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

B) Reduced Monitoring ~~monitoring~~. A supplier required to analyze for bromate may reduce monitoring from monthly to quarterly if the supplier's running annual average bromate concentration is not greater than 0.0025 mg/ℓ based on monthly bromate measurements under subsection (b)(3)(A) for the most recent four quarters, with samples analyzed using USEPA ~~OGWDW Methods, Method~~ 302.0 (09), USEPA ~~Method~~ 317.0 (01) ~~(rev. 2.0)~~, USEPA 321.8 (97), USEPA ~~Method~~ 326.0 (02) ~~(rev. 1.0)~~, or USEPA ~~Method~~ 557 (09) ~~or USEPA Organic and Inorganic Methods, Method 321.8~~, each incorporated by reference in Section 611.102. If a supplier has qualified for reduced bromate monitoring under subsection (b)(3)(B)(i), that supplier may remain on reduced monitoring as long as the running annual average of quarterly bromate samples not greater than 0.0025 mg/ℓ based on samples analyzed using USEPA ~~OGWDW Methods, Method~~ 302.0 (09), USEPA ~~Method~~ 317.0 (01) ~~(rev. 2.0)~~, USEPA 321.8 (97), ~~Method~~ 326.0 (02) ~~(rev. 1.0)~~, or USEPA ~~Method~~ 557 (09) ~~or USEPA Organic and Inorganic Methods, Method 321.8~~. If the running annual average bromate concentration is greater than 0.0025 mg/ℓ, the supplier must resume routine monitoring required by subsection (b)(3)(A).

c) Monitoring Requirements ~~requirements~~ for Disinfectant Residuals ~~disinfectant residuals.~~

1) Chlorine and Chloramines ~~chloramines.~~

A) Routine Monitoring ~~monitoring~~. A CWS or NTNCWS supplier that uses chlorine or chloramines must measure the residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in Sections 611.1054 through 611.1058. A Subpart B system supplier may use the results of residual disinfectant concentration sampling conducted under Section 611.532 for unfiltered systems or Section 611.533 for systems that filter, in lieu of taking separate samples.

B) Reduced Monitoring ~~monitoring~~. Monitoring may not be reduced.

2) Chlorine Dioxide ~~dioxide.~~

A) Routine Monitoring ~~monitoring~~. A CWS, an NTNCWS, or a transient non-CWS supplier that uses chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the supplier must take samples in the distribution system the following day at the locations required by subsection (c)(2)(B), in addition to the sample required at the entrance to the distribution system.

B) Additional Monitoring ~~monitoring~~. On each day following a routine sample monitoring result that exceeds the MRDL, the supplier must take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the supplier must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the supplier must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

C) Reduced Monitoring ~~monitoring~~. Monitoring may not be reduced.

d) Monitoring Requirements ~~requirements~~ for Disinfection Byproduct ~~disinfection byproduct~~ (DBP) Precursors ~~precursors.~~

1) Routine Monitoring ~~monitoring~~. A Subpart B system supplier that uses conventional filtration treatment (as defined in Section 611.101) must monitor each treatment plant for TOC not past the point of combined filter effluent turbidity monitoring and representative of the treated water. A supplier required to monitor under this subsection (d)(1) must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time as the source water sample is taken, a system must monitor for alkalinity in the source water prior to any treatment. A supplier must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

2) Reduced Monitoring ~~monitoring~~. A Subpart B system supplier with an average treated water TOC of less than 2.0 mg/ℓ for two consecutive years, or less than 1.0 mg/ℓ for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The supplier must revert to routine monitoring in the month following the quarter when the annual average treated water TOC greater than or equal to 2.0 mg/ℓ.

e) Bromide. A supplier required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the supplier demonstrates that the average source water bromide concentration is less than 0.05 mg/ℓ based upon representative monthly measurements for one year. The supplier must continue bromide monitoring to remain on reduced bromate monitoring.

f) Monitoring Plans ~~plans~~. Each supplier required to monitor under this Subpart I must develop and implement a monitoring plan. The supplier must maintain the plan and make it available for inspection by the Agency and the general public no later than 30 days following the applicable compliance dates in Section 611.380(b). A Subpart B system supplier that serves more than 3,300 persons must submit a copy of the monitoring plan to the Agency no later than the date of the first report required under Section 611.384. After review, the Agency may require changes in any plan elements. The plan must include at least the following elements:

1) Specific locations and schedules for collecting samples for any parameters included in this Subpart I;

2) How the supplier will calculate compliance with MCLs, MRDLs, and treatment techniques; and

3) If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of Section 611.500, the sampling plan must reflect the entire distribution system.

BOARD NOTE: Derived from 40 CFR 141.132 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.383 Compliance Requirements

a) General Requirements ~~requirements.~~

1) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the supplier fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the supplier's failure to monitor makes it impossible to determine compliance with the MRDL for chlorine or chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2) All samples taken and analyzed under the provisions of this Subpart I must be included in determining compliance, even if that number is greater than the minimum required.

3) If, during the first year of monitoring under Section 611.382, any individual quarter's average will cause the running annual average of that supplier to exceed the MCL for TTHM ~~total trihalomethanes~~, HAA5 ~~haloacetic acids (five)~~, or bromate or the MRDL for chlorine or chloramine, the supplier is out of compliance at the end of that quarter.

b) Disinfection Byproducts ~~byproducts~~ (DBPs)~~.~~

1) TTHMs and HAA5~~.~~

A) For a supplier monitoring quarterly, compliance with MCLs in Section 611.312 must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the supplier as prescribed by Section 611.382(b)(1).

B) For a supplier monitoring less frequently than quarterly, the supplier demonstrates MCL compliance if the average of samples taken that year under the provisions of Section 611.382(b)(1) does not exceed the MCLs in Section 611.312. If the average of these samples exceeds the MCL, the supplier must increase monitoring to once per quarter per treatment plant, and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the supplier is in violation at the end of that quarter. A supplier required to increase to quarterly monitoring must calculate compliance by including the sample that triggered the increased monitoring plus the following three quarters of monitoring.

C) If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the supplier is in violation of the MCL and must notify the public under ~~pursuant to~~ Subpart V ~~of this Part~~ in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384.

D) If a PWS fails to complete four consecutive quarter's monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

2) Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the supplier takes more than one sample, the average of all samples taken during the month) collected by the supplier, as prescribed by Section 611.382(b)(3). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the supplier is in violation of the MCL and must notify the public under ~~pursuant to~~ Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384. If a PWS supplier fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

3) Chlorite. Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by Section 611.382(b)(2)(A)(ii) and Section 611.382(b)(2)(B). If the arithmetic average of any three sample set exceeds the MCL, the supplier is in violation of the MCL and must notify the public under ~~pursuant to~~ Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384.

c) Disinfectant Residuals ~~residuals.~~

1) Chlorine and Chloramines ~~chloramines.~~

A) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the supplier under Section 611.382(c)(1). If the average of quarterly averages covering any consecutive four-quarter period exceeds the MRDL, the supplier is in violation of the MRDL and must notify the public under ~~pursuant to~~ Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384.

B) In cases where a supplier switches between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted under ~~pursuant to~~ Section 611.384 must clearly indicate that residual disinfectant was analyzed for each sample.

2) Chlorine Dioxide ~~dioxide.~~

A) Acute Violations ~~violations~~. Compliance must be based on consecutive daily samples collected by the supplier under Section 611.382(c)(2). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceeds the MRDL, the supplier is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public under ~~pursuant to~~ the procedures for acute health risks in Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384. Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the supplier must notify the public of the violation in accordance with the provisions for acute violations under Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384.

B) Nonacute Violations ~~violations~~. Compliance must be based on consecutive daily samples collected by the supplier under Section 611.382(c)(2). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the supplier is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and must notify the public under ~~pursuant to~~ the procedures for nonacute health risks in Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384. Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the supplier must notify the public of the violation in accordance with the provisions for nonacute violations under Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Section 611.384.

d) Disinfection Byproduct ~~byproduct~~ (DBP) Precursors ~~precursors~~. Compliance must be determined as specified by Section 611.385(c). A supplier may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the supplier. This monitoring is not required and failure to monitor during this period is not a violation. However, any supplier that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in Section 611.141(b)(2) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed under ~~pursuant to~~ Section 611.385(b)(3) and is in violation of an NPDWR. A supplier may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For a supplier required to meet Step 1 TOC removals, if the value calculated under Section 611.385(c)(1)(D) is less than 1.00, the supplier is in violation of the treatment technique requirements and must notify the public under ~~pursuant to~~ Subpart V ~~of this Part~~, in addition to reporting to the Agency under ~~pursuant to~~ Subpart V ~~of this Part~~.

BOARD NOTE: Derived from 40 CFR 141.133 ~~(2014)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.384 Reporting and Recordkeeping Requirements

a) A supplier required to sample quarterly or more frequently must report to the Agency within ten days after the end of each quarter in which samples were collected, notwithstanding the provisions of Section 611.840. A supplier required to sample less frequently than quarterly must report to the Agency within ten days after the end of each monitoring period in which samples were collected.

b) Disinfection Byproducts ~~byproducts~~ (DBPs). A supplier must report the following specified information:

1) A supplier that monitors for TTHMs and HAA5 under the requirements of Section 611.382(b) on a quarterly or more frequently basis must report the following:

A) The number of samples taken during the last quarter;

B) The location, date, and result of each sample taken during the last quarter;

C) The arithmetic average of all samples taken over the last quarter;

D) The annual arithmetic average of the quarterly arithmetic averages of this Section for the last four quarters; and

E) Whether, based on Section 611.383(b)(1), the MCL was violated.

2) A supplier that monitors for TTHMs and HAA5 under the requirements of Section 611.382(b) less frequently than quarterly (but at least annually) must report the following:

A) The number of samples taken during the last year;

B) The location, date, and result of each sample taken during the last monitoring period;

C) The arithmetic average of all samples taken over the last year; and

D) Whether, based on Section 611.383(b)(1), the MCL was violated.

3) A supplier that monitors for TTHMs and HAA5 under the requirements of Section 611.382(b) less frequently than annually must report the following:

A) The location, date, and result of the last sample taken; and

B) Whether, based on Section 611.383(b)(1), the MCL was violated.

4) A supplier that monitors for chlorite under the requirements of Section 611.382(b) must report the following:

A) The number of entry point samples taken each month for the last three months;

B) The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter;

C) For each month in the reporting period, the arithmetic average of each three-sample set for all sample sets taken in the distribution system; and

D) Whether, based on Section 611.383(b)(3), the MCL was violated, in which month it was violated, and how many times it was violated in each month.

5) A supplier that monitors for bromate under the requirements of Section 611.382(b) must report the following:

A) The number of samples taken during the last quarter;

B) The location, date, and result of each sample taken during the last quarter;

C) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year; and

D) Whether, based on Section 611.383(b)(2), the MCL was violated.

BOARD NOTE: The Agency may choose to perform calculations and determine whether the MCL was exceeded, in lieu of having the supplier report the required information.

c) Disinfectants. A supplier must report the following specified information:

1) A supplier that monitors for chlorine or chloramines under the requirements of Section 611.382(c) must report the following:

A) The number of samples taken during each month of the last quarter.

B) The monthly arithmetic average of all samples taken in each month for the last 12 months.

C) The arithmetic average of all monthly averages for the last 12 months.

D) Whether, based on Secton 611.383(c)(1), the MRDL was violated.

2) A supplier that monitors for chlorine dioxide under the requirements of Section 611.382(c) must report the following:

A) The dates, results, and locations of samples taken during the last quarter;

B) Whether, based on Secton 611.383(c)(2), the MRDL was violated; and

C) Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

BOARD NOTE: The Agency may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the supplier report the required information.

d) Disinfection Byproduct ~~byproduct~~ (DBP) Precursors ~~precursors~~ and Enhanced Coagulation ~~enhanced coagulation~~ or Enhanced Softening ~~enhanced softening~~. A supplier must report the following specified information:

1) A supplier that monitors monthly or quarterly for TOC under the requirements of Section 611.382(d) and required to meet the enhanced coagulation or enhanced softening requirements in Section 611.385(b)(2) or (b)(3) must report the following:

A) The number of paired (source water and treated water) samples taken during the last quarter;

B) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter;

C) For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal;

D) Calculations for determining compliance with the TOC percent removal requirements, as provided in Section 611.385(c)(1); and

E) Whether the supplier is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in Section 611.385(b) for the last four quarters.

2) A supplier that monitors monthly or quarterly for TOC under the requirements of Section 611.382(d) and meeting one or more of the alternative compliance standards in Section 611.385(a)(2) or (a)(3) must report the following:

A) The alternative compliance criterion that the supplier is using;

B) The number of paired samples taken during the last quarter;

C) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter;

D) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for a supplier meeting a criterion in Section 611.385(a)(2)(A) or (a)(2)(C) or of treated water TOC for a supplier meeting the criterion in Section 611.385(a)(2)(B);

E) The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for a supplier meeting the criterion in Section 611.385(a)(2)(E) or of treated water SUVA for a supplier meeting the criterion in Section 611.385(a)(2)(F);

F) The running annual average of source water alkalinity for a supplier meeting the criterion in Section 611.385(a)(2)(C) and of treated water alkalinity for a supplier meeting the criterion in Section 611.385(a)(3)(A);

G) The running annual average for both TTHM and HAA5 for a supplier meeting the criterion in Section 611.385(a)(2)(C) or (D);

H) The running annual average of the amount of magnesium hardness removal (as $CaCO_3$ in mg/ℓ) for a supplier meeting the criterion in Section 611.385(a)(3)(B); and

I) Whether the supplier is in compliance with the particular alternative compliance criterion in Section 611.385(a)(2) or (a)(3).

BOARD NOTE: The Agency may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the supplier report the required information.

BOARD NOTE: Derived from 40 CFR 141.134~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.385 Treatment Technique for Control of Disinfection Byproduct (DBP) Precursors

a) Applicability~~.~~

1) A Subpart B system supplier using conventional filtration treatment (as defined in Section 611.101) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in subsection (b) unless the supplier meets at least one of the alternative compliance standards listed in subsection (a)(2) or (a)(3).

2) Alternative compliance standards for enhanced coagulation and enhanced softening systems. A Subpart B system supplier using conventional filtration treatment may use the alternative compliance standards in subsections (a)(2)(A) through (a)(2)(F) to comply with this Section in lieu

of complying with subsection (b). A supplier must comply with monitoring requirements in Section 611.382(d)~~ of this Part~~.

A) The supplier's source water TOC level, measured according to Section 611.381(d)(3), is less than 2.0 mg/ℓ, calculated quarterly as a running annual average.

B) The supplier's treated water TOC level, measured according to Section 611.381(d)(3), is less than 2.0 mg/ℓ, calculated quarterly as a running annual average.

C) The supplier's source water TOC level, measured according to Section 611.381(d)(3), is less than 4.0 mg/ℓ, calculated quarterly as a running annual average; the source water alkalinity, measured according to Section 611.381(d)(1), is greater than 60 mg/ℓ (as $CaCO_3$), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/ℓ and 0.030 mg/ℓ, respectively; or prior to the effective date for compliance in Section 611.380(b), the system has made a clear and irrevocable financial commitment, not later than the effective date for compliance in Section 611.380(b), to use technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/ℓ and 0.030 mg/ℓ, respectively. A supplier must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the Agency for approval. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of an NPDWR.

D) The TTHM and HAA5 running annual averages are no greater than 0.040 mg/ℓ and 0.030 mg/ℓ, respectively, and the supplier uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

E) The supplier's source water SUVA, prior to any treatment and measured monthly according to Section 611.381(d)(4), is less than or equal to 2.0 ℓ/mg-m, calculated quarterly as a running annual average.

F) The supplier's finished water SUVA, measured monthly according to Section 611.381(d)(4), is less than or equal to 2.0 ℓ/mg-m, calculated quarterly as a running annual average.

3) Additional Alternative Compliance Standards ~~alternative compliance standards~~ for Softening Systems ~~softening systems~~. A supplier practicing enhanced softening that cannot achieve the TOC removals required by

subsection (b)(2) may use the alternative compliance standards in subsections (a)(3)(A) and (a)(3)(B) in lieu of complying with subsection (b). A supplier must comply with monitoring requirements in Section 611.382(d). The alternative compliance standards are as follows:

A) The supplier may undertake softening that results in lowering the treated water alkalinity to less than 60 mg/ℓ (as $CaCO_3$), measured monthly according to Section 611.381(d)(1) and calculated quarterly as a running annual average; and

B) The supplier may undertake softening that results in removing at least 10 mg/ℓ of magnesium hardness (as $CaCO_3$), measured monthly according to Section 611.381(d)(6) and calculated quarterly as a running annual average.

b) Enhanced Coagulation ~~coagulation~~ and Enhanced Softening Performance Requirements ~~enhanced softening performance requirements.~~

1) A supplier must achieve the percent reduction of TOC specified in subsection (b)(2) between the source water and the combined filter effluent, unless the Agency approves a supplier's request for alternate minimum TOC removal (Step 2) requirements under subsection (b)(3).

2) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with Section 611.381(d). A supplier practicing softening must meet the Step 1 TOC reductions in the far-right column (source water alkalinity greater than 120 mg/ℓ) for the following specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for a Subpart B System Supplier Using Conventional Treatment[1,2]

Source-water TOC, mg/ℓ	Source-water alkalinity, mg/ℓ as $CaCO_3$		
	0-60	>60-120	>120[3]
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

[1] A supplier meeting at least one of the conditions in subsections (a)(2)(A) through (a)(2)(F) are not required to operate with enhanced coagulation.

[2] A softening system that meets one of the alternative compliance standards in subsection (a)(3) is not required to operate with enhanced softening.

[3] A supplier that practices softening must meet the TOC removal requirements in this column.

3) A Subpart B conventional treatment system supplier that cannot achieve the Step 1 TOC removals required by subsection (b)(2) due to water quality parameters or operational constraints must apply to the Agency, within three months after failure to achieve the TOC removals required by subsection (b)(2), for approval of alternative minimum TOC (Step 2) removal requirements submitted by the supplier. If the PWS cannot achieve the Step 1 TOC removal requirement due to water quality parameters or operational constraints, the Agency must approve the use of the Step 2 TOC removal requirement. If the Agency approves the alternative minimum TOC removal (Step 2) requirements, the Agency may make those requirements retroactive for the purposes of determining compliance. Until the Agency approves the alternative minimum TOC removal (Step 2) requirements, the supplier must meet the Step 1 TOC removals contained in subsection (b)(2).

4) Alternative Minimum ~~minimum~~ TOC Removal ~~removal~~ (Step 2) Requirements ~~requirements~~. An application made to the Agency by an enhanced coagulation system supplier for approval of alternative minimum TOC removal (Step 2) requirements under subsection (b)(3) must include, at a minimum, results of bench- or pilot-scale testing conducted under subsection (b)(4)(B). The submitted bench- or pilot-scale testing must be used to determine the alternative enhanced coagulation level.

A) For the purposes of this Subpart I, "alternative enhanced coagulation level" is defined as coagulation at a coagulant dose and pH, as determined by the method described in subsections (b)(4)(A) through (b)(4)(E), such that an incremental addition of 10 mg/ℓ of alum (or equivalent amount of ferric salt) results in a TOC removal of less than or equal to 0.3 mg/ℓ. The percent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the supplier. Once approved by the Agency, this minimum requirement supersedes the minimum TOC removal required by the table in subsection (b)(2). This requirement will be effective until such time as the Agency approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve alternative minimum TOC removal levels is a violation of National Primary Drinking Water Regulations.

B) Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/ℓ increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH

Alkalinity (mg/ℓ as $CaCO_3$)	Target pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

C) For waters with alkalinities of less than 60 mg/ℓ for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the supplier must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/ℓ per 10 mg/ℓ alum added (or equivalent addition of iron coagulant) is reached.

D) The supplier may operate at any coagulant dose or pH necessary (consistent with other NPDWRs) to achieve the minimum TOC percent removal approved under subsection (b)(3).

E) If the TOC removal is consistently less than 0.3 mg/ℓ of TOC per 10 mg/ℓ of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The supplier may then apply to the Agency for a waiver of enhanced coagulation requirements. If the TOC removal is consistently less than 0.3 mg/ℓ of TOC per 10 mg/ℓ of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the Agency must grant the waiver of enhanced coagulation requirements.

c) Compliance Calculations ~~calculations.~~

1) A Subpart B system supplier other than those identified in subsection (a)(2) or (a)(3) must comply with requirements contained in subsection (b)(2) or (b)(3). A supplier must calculate compliance quarterly, beginning after the supplier has collected 12 months of data, by determining an annual average using the following method:

A) Determine actual monthly TOC percent removal, equal to the following:

$$\left(1-\left(\frac{\text{treated water TOC}}{\text{source water TOC}}\right)\right)\times 100$$

B) Determine the required monthly TOC percent removal.

C) Divide the value in subsection (c)(1)(A) by the value in subsection (c)(1)(B).

D) Add together the results of subsection (c)(1)(C) for the last 12 months and divide by 12.

E) If the value calculated in subsection (c)(1)(D) is less than 1.00, the supplier is not in compliance with the TOC percent removal requirements.

2) A supplier may use the provisions in subsections (c)(2)(A) through (c)(2)(E) in lieu of the calculations in subsection (c)(1)(A) through (c)(1)(E) to determine compliance with TOC percent removal requirements.

A) In any month that the supplier's treated or source water TOC level, measured according to Section 611.381(d)(3), is less than 2.0 mg/ℓ, the supplier may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (c)(1)(C)) when calculating compliance under the provisions of subsection (c)(1).

B) In any month that a system practicing softening removes at least 10 mg/ℓ of magnesium hardness (as $CaCO_3$), the supplier may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (c)(1)(C)) when calculating compliance under the provisions of subsection (c)(1).

C) In any month that the system's source water SUVA, prior to any treatment and measured according to Section 611.381(d)(4), is less than or equal to 2.0 ℓ/mg-m, the supplier may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (c)(1)(C)) when calculating compliance under the provisions of subsection (c)(1).

D) In any month that the system's finished water SUVA, measured according to Section 611.381(d)(4), is less than or equal to 2.0 ℓ/mg-m, the supplier may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (c)(1)(C)) when calculating compliance under the provisions of subsection (c)(1).

E) In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/ℓ (as $CaCO_3$), the supplier may assign a monthly value of 1.0 (in lieu of the value calculated in subsection (c)(1)(C)) when calculating compliance under the provisions of subsection (c)(1).

3) A Subpart B system supplier using conventional treatment may also comply with the requirements of this Section by meeting the standards in subsection (a)(2) or (a)(3).

d) Treatment Technique Requirements ~~technique requirements~~ for Disinfection Byproduct ~~disinfection byproduct~~ (DBP) Precursors ~~precursors~~. Treatment techniques to control the level of disinfection byproduct (DBP) precursors in drinking water treatment and distribution systems, for a Subpart B system supplier using conventional treatment, are enhanced coagulation or enhanced softening.

BOARD NOTE: Derived from 40 CFR 141.135 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART K: GENERAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.490 Certified Laboratories

a) For the purpose of determining compliance with Subparts G, K through O, Q, and S ~~of this Part~~, samples will be considered only if they have been analyzed by one of the following:

   1) A laboratory certified under ~~pursuant to~~ Section 4(o) of the Act ~~[415 ILCS 5/4(o)]~~;

   2) A laboratory certified by USEPA;

   3) When no laboratory has been certified under ~~pursuant to~~ subsection (a)(1) to analyze a particular contaminant, a laboratory certified, registered, accredited, licensed, or otherwise approved by another state with primary enforcement responsibility, or an agency of the federal government, unless the Agency has, by written notice, informed the supplier that a particular laboratory or laboratories may not be used; or

   4) For measurements of alkalinity, calcium, conductivity, disinfectant residual, orthophosphate, silica, turbidity, free chlorine residual, temperature, and pH, a person under the supervision of a certified operator (35 Ill. Adm. Code 603.103).

b) Nothing in this Part must be construed to preclude the Agency or any duly designated representative of the Agency from taking samples or from using the results from such samples to determine compliance by a supplier of water with the applicable requirements of this Part.

c) The CWS supplier must have required analyses performed either at an Agency laboratory or a certified laboratory. The Agency may require that some or all of the required samples be submitted to its laboratories.

BOARD NOTE: Subsections (a)(1), (a)(2), (a)(4), and (b) are derived from 40 CFR 141.28 ~~(2016)~~. Subsections (a)(3) and (c) are additional State requirements.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART L: MICROBIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.531 Analytical Requirements

The analytical methods specified in this Section, or alternative methods approved by the Agency under Section 611.480, must be used to demonstrate compliance with the requirements of only 611.Subpart B. Measurements for pH, temperature, turbidity, and RDCs must be conducted under the supervision of a certified operator. Measurements for total coliforms, fecal coliforms and HPC must be conducted by a certified laboratory in one of the categories listed in Section 611.490(a). The following procedures must be performed by the following methods, incorporated by reference in Section 611.102:

a) A supplier must conduct analyses as follows:

1) The supplier must conduct analyses for pH and temperature in accordance with one of the methods listed at Section 611.611; and

2) The supplier must conduct analyses for total coliforms, fecal coliforms, heterotrophic bacteria, and turbidity in accordance with one of the following methods, and by using analytical test procedures contained in USEPA Technical Notes, incorporated by reference in Section 611.102, as follows:

A) Total Coliforms~~.~~

BOARD NOTE: The time from sample collection to initiation of analysis for source (raw) water samples required by Section 611.532 and Subpart B only must not exceed eight hours. The supplier is encouraged but not required to hold samples below 10° C during transit.

i) Total Coliform Fermentation Technique. SM ~~coliform fermentation technique: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 9221 A (93), SM 9221 A (94), SM 9221 A (99), SM 9221 A (06), SM 9221 A (14), SM 9221 B (93), SM 9221 B (94), SM 9221 B (99), SM 9221 B (06), SM 9221 B (14), SM 9221 ~~and~~ C (93), SM 9221 C (94), SM 9221 C (99), SM 9221 C (06), or 9221 C (14).

BOARD NOTE: Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth if the supplier conducts at least 25 parallel tests between this medium and lauryl tryptose broth using the water normally tested and this comparison demonstrates that the false-positive rate and false-negative rate for total coliforms, using lactose broth, is less than ten ~~10~~ percent. If inverted tubes are used to detect gas production, the media should cover these tubes at least one-half to two-thirds after the sample is added. No requirement exists to run the completed phase on ten ~~10~~ percent of all total coliform-positive confirmed tubes.

ii) Total Coliform Membrane Filter Technique. SM ~~coliform membrane filter technique: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 9222 A (91), SM 9222 A (94), SM 9222 A (97), SM 9222 A (06), SM 9222 A (15), SM 9222 B (91), SM 9222 B (94), SM 9222 B (97), 9222 B (06), SM 9222 B (15), ~~and~~ SM 9222 C (91), SM 9222 C (94), SM 9222 C (97), SM 9222 C (06), or SM 9222 C (15).

iii) ONPG-MUG ~~test~~ (also known as ~~the~~ Colilert® ~~Test~~).~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, or 21st ed., Method~~ 9223 (92), SM 9223 (94), SM 9223 (97), SM ~~or Standard Methods, 21st or 22nd ed., Method~~ 9223 B (04), or SM 9223 B (16).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 9221 A, B, and C; 9222 A, B, and C; and 9223 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Methods 9221 A, B, and C and 9223 B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Methods 9221 A, B, and C-06 and 9223 B-04 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA listed Standard Methods Online, Method 9223 B-97 in note 1 to the table in 40 CFR 141.25(a). This is identical to Standard Methods 21st ed., Method 9223 B. The Board lists both Standard Methods, Methods 9223 and 9223 B. Because Standard Methods, 22nd ed., Methods 9221 A, B, and C and 9223 B are the same versions as Standard Methods Online, Methods 9221 A, B, and C-06 and 9223 B-04, the Board has not listed the Standard Methods Online versions separately.~~

B) Fecal Coliforms~~.~~

BOARD NOTE: The time from sample collection to initiation of analysis for source (raw) water samples required by Section 611.532 and Subpart B only must not exceed eight hours. The supplier is encouraged but not required to hold samples below 10° C during transit.

i) Fecal Coliform Procedure. SM ~~coliform procedure: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 9221 E (93), SM 9221 E (94), SM 9221 E (99), SM 9221 E (06), or SM 9221 E (14).

BOARD NOTE: A-1 broth may be held up to seven days in a tightly closed screwcap tube at 4° C (39° F).

ii) Fecal Coliform Membrane Filter Procedure.~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 9222 D (91), SM 9222 D (94), 9222 D (97), 9222 D (06), or 9222 D (15).

~~BOARD NOTE: Because approved alternative method Standard Methods Online, Method 9221 E-99 is the same version as Standard Methods, 21st ed., the board has not listed the Standard Methods Online version separately. USEPA added Standard Methods, 21st ed., Methods 9221 E and 9222 D as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Methods 9221 E and 9222 D as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Methods 9221 E-06 and 9222 D-06 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Methods 9221 E and 9222 D are the same versions as Standard Methods Online, Methods 9221 E-06 and 9222 D-06, the Board has not listed the Standard Methods Online versions separately.~~

C) Heterotrophic Bacteria ~~bacteria.~~

i) Pour Plate Method. SM ~~plate method: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 9215 B (88), SM 9215 B (94), SM 9215 B (00), SM 9215 B (04), or SM 9215 B (16).

BOARD NOTE: The time from sample collection to initiation of analysis must not exceed eight hours. The supplier is encouraged but not required to hold samples below 10° C during transit.

ii) SimPlate (00) ~~method~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 9215 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 9215 B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods~~

~~Online, Method 9215 B-04 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 9215 B is the same version as Standard Methods Online, Method 9215 B-04, the Board has not listed the Standard Methods Online versions separately.~~

D) Turbidity~~.~~

BOARD NOTE: 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.

i) Nephelometric Method. SM ~~method: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 2130 B (88), SM 2130 B (94), SM 2130 B (01); USEPA 180.1 (93); or Hach 8195 (18).

~~ii) Nephelometric method: USEPA Environmental Inorganic Methods, Method 180.1 (rev. 2.0).~~

ii~~i~~) GLI Method 2 (92).

iii~~v~~) Laser Nephelometry. Hach 10133 (00) (FilterTrak) ~~Method 10133~~.

iv) Laser Nephelometry (On-Line). Lovibond PTV 6000 (16), ~~nephelometry (on-line):~~ Mitchell ~~Method~~ M5271 (09), or ~~rev. 1.1 and~~ Mitchell ~~Method~~ M5331 (16)~~, rev. 1.2~~.

~~vi) Laser nephelometry (on-line): Lovibond PTV 6000.~~

v~~ii~~) LED Nephelometry (On-Line). AMI Turbiwell (09), Lovibond PTV 1000 (16), Lovibond PTV 2000 (16), ~~nephelometry (on-line):~~ Mitchell ~~Method~~ M5331 (09), or Mitchell M5331 (16) ~~rev. 1.1 and Mitchell Method M5331, rev. 1.2~~.

~~viii) LED nephelometry (on-line): AMI Turbiwell Method.~~

~~ix) LED nephelometry (on-line): Lovibond PTV 1000 or Lovibond PTV 2000.~~

vi~~x~~) LED Nephelometry (Portable). ~~nephelometry (portable):~~ Orion ~~Method~~ AQ4500 (09).

vii~~xi~~) 360° Nephelometry.~~:~~ Hach ~~Method~~ 10258 (16) or Hach 10258 (18).

~~BOARD NOTE:USEPA added Standard Methods, 21st ed., Method 9130 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Mitchell Method M5271 and Orion Method AQ4500 as approved alternative methods on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added AMI Turbiwell Method as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Method 2130 B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10258 and Mitchell Method M5331, rev. 1.2 as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839). USEPA added Lovibond PTV 1000, Lovibond PTV 2000, and Lovibond PTV 6000 as approved alternative methods on July 27, 2017 (at 82 Fed. Reg. 34861).~~

b) A supplier must measure residual disinfectant concentrations with one of the following analytical methods:

1) Free Chlorine ~~chlorine.~~

A) Amperometric Titration. ASTM D1253-03, ASTM D1253-08, ASTM D1253-14, SM 4500-Cl D (89), SM 4500-Cl D (93), or SM 4500-Cl D (00).

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-Cl D.~~

~~ii) ASTM Method D1253-03, D1253-08, or D1253-14.~~

B) DPD Ferrous Titrimetric.~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl F (89), SM 4500-Cl F (93), or SM 4500-Cl F (00).

C) DPD Colimetric. Hach 10260 (13), SM 4500-Cl G (89), SM 4500-Cl G (93), or SM 4500-Cl G (00).~~:~~

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-Cl G; or~~

~~ii) Hach Method 10260.~~

D) Syringaldazine (FACTS).~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl H (89), SM 4500-Cl H (93), or SM 4500-Cl H (00).

E) On-Line Chlorine Analyzer. ~~On-line chlorine analyzer:~~ USEPA ~~OGWDW Methods, Method~~ 334.0 (09).

F) Amperometric Sensor. ~~sensor:~~ Palintest ChloroSense (09).

G) Indophenol Colorimetric. ~~colorimetric:~~ Hach ~~Method~~ 10241 (15).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-Cl D, F, G, and H; Method 4500-ClO_2 C and E as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616).USEPA added ASTM Method D1253-08, USEPA OGWDW Methods, Method 334.0, and Palintest ChloroSense as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 4500-Cl B, F, G, and H as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10260 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D1253-14 and Hach Method 10241 as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839).~~

2) Total Chlorine ~~chlorine.~~

A) Amperometric Titration. ASTM D1253-03, ASTM D1253-08, ASTM D1253-14, SM 4500-Cl D (89), SM 4500-Cl D (93), or SM 4500-Cl D (00).

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-Cl D.~~

~~ii) ASTM Method D1253-03, D1253-08, or D1253-14.~~

B) Amperometric Titration (low level measurement). ~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl E (89), 4500-Cl E (93), or 4500-Cl E (00).

C) DPD Ferrous Titrimetric. ~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl F (89), 4500-Cl F (93), or 4500-Cl F (00).

D) DPD Colimetric. SM 4500-Cl G (89), 4500-Cl G (93), or 4500-Cl G (00) or Hach 10260 (13). ~~:~~

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-Cl G; or~~

~~ii) Hach Method 10260.~~

E) Iodometric Electrode. ~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-Cl I (89), 4500-Cl I (93), or 4500-Cl I (00).

F) On-Line Chlorine Analyzer. ~~On-line chlorine analyzer:~~ USEPA ~~OGWDW Methods, Method~~ 334.0 (09).

G) Amperometric Sensor. ~~sensor:~~ Palintest ChloroSense (09).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-Cl D, E, F, G, and I as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D1253-08, USEPA OGWDW Methods, Method 334.0, and Palintest ChloroSense as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods, 22nd ed., Methods 4500-Cl D, E, F, G, and I as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Hach Method 10260 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D1253-14 as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

3) Chlorine Dioxide ~~dioxide.~~

A) Amperometric Titration. ChlordioX Plus (13), SM 4500-ClO_2 C (88), SM 4500-ClO_2 C (93), SM 4500-ClO_2 C (00), SM 4500-ClO_2 E (88), SM 4500-ClO_2 E (93), or SM 4500-ClO_2 E (00).~~:~~

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-ClO_2 C or E; or~~

~~ii) ChlordioX Plus Test.~~

B) DPD Method. SM ~~Standard Methods, 18th, 19th, or 20th ed., Method~~ 4500-ClO_2 D (88) or SM 4500-ClO_2 D (93).

C) Spectrophotometric.~~:~~ USEPA ~~OGWDW Methods, Method~~ 327.0 (05) ~~(rev. 1.1)~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 4500-ClO_2 C, D, and E and Method 4500-O_3 B as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Methods 4500-ClO_2 C and E as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ChlordioX Plus Test as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081).~~

4) Ozone.~~:~~ Indigo Method. SM~~: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-O_3 B (88), SM 4500-O_3 B (93), or SM 4500-O_3 B (00).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 4500-O_3 B as an approved alternative method on June 3, 2008 (at 73 Fed.~~

~~Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 4500-O_3 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558).~~

5) Alternative Test Methods. ~~test methods:~~ The Agency may grant a SEP that allows a supplier to use alternative chlorine test methods as follows:

A) DPD Colorimetric Test Kits. ~~colorimetric test kits:~~ Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using ITS Method D99-003 ~~DPD colorimetric test kits~~.

B) Continuous Monitoring ~~monitoring~~ for Free ~~free~~ and Total Chlorine. ~~total chlorine:~~ Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument, provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days or as otherwise provided by the Agency.

~~BOARD NOTE: Suppliers may use a five-tube test or a 10-tube test.~~

BOARD NOTE: Derived from 40 CFR 141.74(a) and appendix A to subpart C of 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 2130 B-01 appears in the 21st, 22nd, and 23rd editions as Method 2130 B. In this Section, this appears as SM 2130 B (01).

Standard Methods Online, Methods 4500-Cl D-93, 4500-Cl E-93, 4500-Cl F-93, 4500-Cl G-93, 4500-Cl H-93, and 4500-Cl I-93 appear in the 19th and 20th editions as Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, and 4500-Cl I. In this Section, these appear as SM 4500-Cl D (93), SM 4500-Cl E (93), SM 4500-Cl F (93), SM 4500-Cl G (93), SM 4500-Cl H (93), and SM 4500-Cl I (93).

Standard Methods Online, Methods 4500-Cl D-00, 4500-Cl E-00, 4500-Cl F-00, 4500-Cl G-00, 4500-Cl H-00, and 4500-Cl I-00 appear in the 21st, 22nd, and 23rd editions as Methods 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, and 4500-Cl I. In this Section, these appear as SM 4500-Cl D (00), SM 4500-Cl E (00), SM 4500-Cl F (00), SM 4500-Cl G (00), SM 4500-Cl H (00), and SM 4500-Cl I (00).

Standard Methods Online, Methods 4500-ClO_2 C-93, 4500-ClO_2 D-93, and 4500-ClO_2 E-93 appear in the 19th and 20th editions as Methods 4500-ClO_2 C, 4500-ClO_2 D, and 4500-ClO_2 E. In this Section, these appear as SM 4500-ClO_2 C (93), SM 4500-ClO_2 D (93), and SM 4500-ClO_2 E (93).

Standard Methods Online, Methods 4500-ClO_2 C-00 and 4500-ClO_2 E-00 appear in the 19th and 20th editions as Methods 4500-ClO_2 C and 4500-ClO_2 E. In this Section, these appear as SM 4500-ClO_2 C (00) and SM 4500-ClO_2 E (00).

Standard Methods Online, Method 4500-O_3 B-97 appears in the 20th edition as Method 4500-O_3 B. In this Section, this appears as SM 4500-O_3 B (97).

Standard Methods Online, Method 9215 B-00 appears in the 21st edition as Method 9215 B. In this Section, these appear as SM 9215 B (00).

Standard Methods Online, Method 9215 B-04 appears in the 22nd edition as Method 9215 B. In this Section, this appears as SM 9215 B (04).

Standard Methods Online, Methods 9221 A-99, 9221 B-99, and 9221 C-99 appear in the 21st edition as Methods 9221 A, 9221 B, and 9221 C. In this Section, these appear as SM 9221 A (99), SM 9221 B (99), and SM 9221 C (99).

Standard Methods Online, Methods 9221 A-06, 9221 B-06, 9221 C-06, and 9221 E-06 appear in the 22nd edition as Methods 9221 A, 9221 B, 9221 C, and 9221 E. In this Section, these appear as SM 9221 A (06), SM 9221 B (06), SM 9221 C (06), and SM 9221 E (06).

Standard Methods Online, Methods 9222 A-97, 9222 B-97, and 9222 C-97 appear in the 20th and 21st editions as Methods 9222 A, 9222 B, and 9222 C. In this Section, these appear as SM 9222 A (97), SM 9222 B (97), and SM 9222 C (97).

Standard Methods Online, Method 9223 B-97 appears in the 20th and 21st editions as Method 9223 B. In this Section, this appears as SM 9223 B (97).

Standard Methods Online, Method 9223 B-04 appears in the 22nd edition as Method 9223 B. In this Section, this appears as SM 9223 B (04).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.532 Unfiltered PWSs

A supplier that uses a surface water source and does not provide filtration treatment must monitor, unless the Agency has determined, under Section 611.211, that filtration is required. If the Agency determines that filtration is required, it must specify alternative monitoring requirements, as appropriate, until filtration is in place. A supplier that uses a groundwater source under the direct influence of surface water and which does not provide filtration treatment must monitor within six months after the Agency has determined, under Section 611.212, that the groundwater source is under the direct influence of surface water unless the Agency has determined that filtration is required, in which case the Agency must specify alternative monitoring requirements, as appropriate, until filtration is in place.

a) Fecal coliform or total coliform density measurements as required by Section 611.231(a) must be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The supplier must sample for fecal or total coliforms at the minimum frequency specified in Table B each week the supplier serves water to the public. Also, one fecal or total coliform density measurement must be made every day the supplier serves water to the public and the turbidity of the source water exceeds 1 NTU (these samples count towards the weekly coliform sampling requirement) unless the Agency determines that the supplier, for logistical reasons outside the supplier's control cannot have the sample analyzed within 30 hours after collection.

b) Turbidity measurements as required by Section 611.231(b) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours (or more frequently) that the supplier serves water to the public. A supplier may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by a SEP.

c) The total inactivation ratio for each day that the supplier is in operation must be determined based on the $CT_{99.9}$ values in Appendix B, as appropriate. The parameters necessary to determine the total inactivation ratio must be monitored as follows:

1) The temperature of the disinfected water must be measured at least once per day at each RDC sampling point.

2) If the supplier uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine RDC sampling point.

3) The disinfectant contact times ("T") must be determined for each day during peak hourly flow.

4) The RDCs ("C") of the water before or at the first customer must be measured each day during peak hourly flow.

5) If a supplier uses a disinfectant other than chlorine, the supplier may monitor by other methods approved under Section 611.241(a)(1) and (a)(2).

d) The total inactivation ratio must be calculated as follows:

1) If the supplier uses only one point of disinfectant application, the supplier may determine the total inactivation ratio based on either of the following two methods:

A) One inactivation ratio ($Ai = CT_{calc}/CT_{99.9}$) is determined before or at the first customer during peak hourly flow and, if the Ai is greater than 1.0, the 99.9 percent Giardia lamblia inactivation requirement has been achieved; or

B) Successive Ai values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:

i) Determine the following, for each sequence:

$Ai = CT_{calc}/CT_{99.9}$

ii) Add the Ai values together, as follows:

$B = \sum(Ai)$

iii) If B is greater than 1.0, the 99.9 percent Giardia lamblia inactivation requirement has been achieved.

2) If the supplier uses more than one point of disinfectant application before or at the first customer, the supplier must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The Ai value of each sequence and B must be calculated using the method in subsection (d)(1)(B) to determine if the supplier is in compliance with Section 611.241.

3) Although not required, the total percent inactivation (PI) for a supplier with one or more points of RDC monitoring may be calculated as follows:

$$PI = 100 - \frac{100}{10^{3B}}$$

e) The RDC of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment, and suppliers serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed in Table C. If at any time the RDC falls below 0.2 mg/ℓ in a system using grab sampling in lieu of continuous monitoring, the supplier must take a grab sample every four hours until the RDC is equal to or greater than 0.2 mg/ℓ.

f) Points of Measurement ~~measurement.~~

1) The RDC must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in Sections 611.1054 through 611.1058. The Agency must allow a supplier that uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant

residual samples at points other than the total coliform sampling points if the Agency determines, by a SEP, that such points are more representative of treated (disinfected) water quality within the distribution system. HPC may be measured in lieu of RDC.

2) If the Agency determines, under ~~pursuant to~~ Section 611.213, that a supplier has no means for having a sample analyzed for HPC, measured as specified in subsection (a), the requirements of subsection (f)(1) do not apply to that supplier.

BOARD NOTE: Derived from 40 CFR 141.74(b) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.533 Filtered PWSs

A supplier that uses a surface water source or a groundwater source under the influence of surface water and provides filtration treatment must monitor in accordance with this Section.

a) Turbidity measurements as required by Section 611.250 must be performed on representative samples of the PWS's filtered water every four hours (or more frequently) that the supplier serves water to the public. A supplier may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by a SEP. For any suppliers using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the Agency must, by special exception permit condition, reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For suppliers serving 500 or fewer persons, the Agency must, by a SEP, reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Agency determines that less frequent monitoring is sufficient to indicate effective filtration performance.

b) RDC Entering Distribution System ~~entering distribution system.~~

1) Suppliers serving more than 3300 persons. The RDC of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that, if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment.

2) Suppliers serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day prescribed in Table C. If at any time the RDC falls below 0.2 mg/ℓ in a system using grab sampling in lieu of continuous monitoring, the supplier must take a grab sample every four hours until RDC is equal

to or greater than 0.2 mg/ℓ.

c) Points of Measurement ~~measurement.~~

1) The RDC must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in Sections 611.1054 through 611.1058. The Agency must allow a supplier that uses both a surface water source, or a groundwater source under direct influence of surface water, and a groundwater source to take RDC samples at points other than the total coliform sampling points if the Agency determines that such points are more representative of treated (disinfected) water quality within the distribution system. HPC, measured as specified in Section 611.531(a), may be measured in lieu of RDC.

2) Subsection (c)(1) does not apply if the Agency determines, under Section 611.213(c), that a system has no means for having a sample analyzed for HPC by a certified laboratory under the requisite time and temperature conditions specified by Section 611.531(a) and that the supplier is providing adequate disinfection in the distribution system.

BOARD NOTE: Derived from 40 CFR 141.74(c) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART N: INORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.600 Applicability

The following types of suppliers must conduct monitoring to determine compliance with the old MCLs in Section 611.300 and the revised MCLs in 611.301, as appropriate, in accordance with this Subpart N:

a) CWS suppliers.

b) NTNCWS suppliers.

c) Transient non-CWS suppliers to determine compliance with the nitrate and nitrite MCLs.

d) Detection Limits ~~limits~~. The following are detection limits for purposes of this Subpart N (MCLs from Section 611.301 are set forth for information purposes only):

Contaminant	MCL (mg/ℓ, except asbestos)	Method	Detection Limit (mg/ℓ)
Antimony	0.006	Atomic absorption-furnace technique	0.003
		Atomic absorption-furnace technique (stabilized temperature)	0.0008[5]
		Inductively coupled plasma-mass spectrometry	0.0004
		Atomic absorption-gaseous hydride technique	0.001
Arsenic	0.010	Atomic absorption-furnace technique	0.001
		Atomic absorption-furnace technique (stabilized temperature)	0.00005[6]
		Atomic absorption-gaseous hydride technique	0.001
		Inductively coupled plasma-mass spectrometry	0.0014[7]
Asbestos	7 MFL[1]	Transmission electron microscopy	0.01 MFL
Barium	2	Atomic absorption-furnace technique	0.002
		Atomic absorption-direct aspiration technique	0.1
		Inductively coupled plasma arc furnace	0.002
		Inductively coupled plasma	0.001
Beryllium	0.004	Atomic absorption-furnace	0.0002

		technique	
		Atomic absorption-furnace technique (stabilized temperature)	0.00002[5]
		Inductively coupled plasma[2]	0.0003
		Inductively coupled plasma-mass spectrometry	0.0003
Cadmium	0.005	Atomic absorption-furnace technique	0.0001
		Inductively coupled plasma	0.001
Chromium	0.1	Atomic absorption-furnace technique	0.001
		Inductively coupled plasma	0.007
		Inductively coupled plasma	0.001
Cyanide	0.2	Distillation, spectrophotometric[3]	0.02
		Automated distillation, spectrophotometric[3]	0.005
		Distillation, selective electrode[3]	0.05
		Distillation, amenable, spectrophotometric[4]	0.02
		UV, distillation, spectrophotometric[8]	0.0005
		Micro distillation, flow injection, spectrophotometric[3]	0.0006
		Ligand exchange with amperometry[4]	0.0005
Mercury	0.002	Manual cold vapor technique	0.0002
		Automated cold vapor technique	0.0002

Nickel	No MCL	Atomic absorption-furnace technique	0.001
		Atomic absorption-furnace technique (stabilized temperature)	0.0006[5]
		Inductively coupled plasma[2]	0.005
		Inductively coupled plasma-mass spectrometry	0.0005
Nitrate (as N)	10	Manual cadmium reduction	0.01
		Automated hydrazine reduction	0.01
		Automated cadmium reduction	0.05
		Ion-selective electrode	1
		Ion chromatography	0.01
		Capillary ion electrophoresis	0.076
Nitrite (as N)	1	Spectrophotometric	0.01
		Automated cadmium reduction	0.05
		Manual cadmium reduction	0.01
		Ion chromatography	0.004
		Capillary ion electrophoresis	0.103
Selenium	0.05	Atomic absorption-furnace technique	0.002
		Atomic absorption-gaseous hydride technique	0.002
Thallium	0.002	Atomic absorption-furnace technique	0.001
		Atomic absorption-furnace	0.0007[5]

	technique (stabilized temperature)	
	Inductively coupled plasma-mass spectrometry	0.0003

Footnotes.

1 “MFL” means millions of fibers per liter less than 10 µm.

2 Using a 2× preconcentration step as noted in USEPA ~~Method~~ 200.7 (94). Lower MDLs may be achieved when using a 4× preconcentration.

3 Screening method for total cyanides.

4 Measures “free” cyanides when distillation, digestion, or ligand exchange is omitted.

5 Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.

6 The MDL reported for USEPA ~~Method~~ 200.9 (94) (atomic absorption-platform furnace (stabilized temperature)) was determined using a 2× concentration step during sample digestion. The MDL determined for samples analyzed using direct analyses (i.e., no sample digestion) will be higher. Using multiple depositions, USEPA ~~Method~~ 200.9 (94) is capable of obtaining an MDL of 0.0001 mg/ℓ.

7 Using selective ion monitoring, USEPA ~~Method~~ 200.8 (94) (ICP-MS) is capable of obtaining an MDL of 0.0001 mg/ℓ.

8 Measures total cyanides when UV-digestor is used, and “free” cyanides when UV-digestor is bypassed.

BOARD NOTE: Subsections (a) through (c) are derived from 40 CFR 141.23 preamble ~~(2016)~~, and subsection (d) is derived from 40 CFR 141.23(a)(4)(i) and appendix A to subpart C of 40 CFR 141 ~~(2016)~~. See the Board Note at Section 611.301(b) relating to the MCL for nickel.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.601 Monitoring Frequency

Monitoring must be conducted as follows:

a) Required Sampling ~~sampling.~~

1) Each supplier must take a minimum of one sample at each sampling point at the times required by Section 611.610 beginning in the initial compliance period.

2) Each sampling point must produce samples that are representative of the water from each source after treatment or from each treatment plant, as required by subsection (b). The total number of sampling points must be representative of the water delivered to users throughout the PWS.

3) The supplier must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant and the Agency has granted a SEP under ~~pursuant to~~ subsection (b)(5).

b) Sampling Points ~~points.~~

1) Sampling points for GWSs. Unless otherwise provided by SEP, a GWS supplier must take at least one sample from each of the following points: each entry point that is representative of each well after treatment.

2) Sampling points for an SWS or a mixed system supplier . Unless otherwise provided by SEP, an SWS or mixed system supplier must take at least one sample from each of the following points:

A) Each entry point after the application of treatment; or

B) A point in the distribution system that is representative of each source after treatment.

3) If a supplier draws water from more than one source, and the sources are combined before distribution, the supplier must sample at an entry point during periods of normal operating conditions when water is representative of all sources being used.

4) Additional sampling points. The Agency must, by SEP, designate additional sampling points in the distribution system or at the consumer's tap if it determines that such samples are necessary to more accurately determine consumer exposure.

5) Alternative sampling points. The Agency must, by SEP, approve alternate sampling points if the supplier demonstrates that the points are more representative than the generally required point.

c) This subsection corresponds with 40 CFR 141.23(a)(4), an optional provision relating to compositing of samples that USEPA does not require for state programs. This statement maintains structural consistency with USEPA rules.

d) The frequency of monitoring for the following contaminants must be in accordance with the following Sections:

1) Asbestos: Section 611.602;

2) Antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium: Section 611.603;

3) Nitrate: Section 611.604; and

4) Nitrite: Section 611.605.

BOARD NOTE: Derived from 40 CFR 141.23(a) and (c)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.602 Asbestos Monitoring Frequency

The frequency of monitoring conducted to determine compliance with the MCL for asbestos in Section 611.301 is as follows:

a) Unless the Agency has determined under subsection (c) that the PWS is not vulnerable, each CWS and NTNCWS supplier must monitor for asbestos during the first compliance period of each compliance cycle.

b) CWS suppliers may apply to the Agency, by way of an application for a SEP, for a determination that the CWS is not vulnerable based on consideration of the criteria listed in subsection (c).

c) The Agency must determine that the CWS is "not vulnerable" if the CWS is not vulnerable to contamination either from asbestos in its source water, from corrosion of asbestos-cement pipe, or from both, based on a consideration of the following factors:

1) Potential asbestos contamination of the water source; and

2) The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

d) A SEP based on a determination that a CWS is not vulnerable to asbestos contamination expires at the end of the compliance cycle for which it was issued.

e) A supplier of a PWS vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe must take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

f) A supplier of a PWS vulnerable to asbestos contamination due solely to source water must monitor in accordance with Section 611.601.

g) A supplier of a PWS vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe must take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

h) A supplier that exceeds the MCL, as determined in Section 611.609, must monitor quarterly beginning in the next quarter after the violation occurred.

i) Reduction of Quarterly Monitoring~~ quarterly monitoring.~~

1) The Agency must issue a SEP that reduces the monitoring frequency to that specified by subsection (a) if it determines that the sampling point is reliably and consistently below the MCL.

2) The request must, at a minimum, include the following information:

A) For a GWS: two quarterly samples.

B) For an SWS or mixed system: four quarterly samples.

3) In issuing a SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. All SEPs that allow less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring under subsection (h) if it violates the MCL specified by Section 611.609.

j) This subsection (j) corresponds with 40 CFR 141.23(b)(10), which pertains to a compliance period long since expired. This statement maintains structural consistency with the federal regulations.

BOARD NOTE: Derived from 40 CFR 141.23(b)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.603 Inorganic Monitoring Frequency

The frequency of monitoring conducted to determine compliance with the revised MCLs in Section 611.301 for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium is as follows:

a) Suppliers must take samples at each sampling point, beginning in the initial compliance period, as follows:

1) For a GWS supplier: at least one sample during each compliance period;

2) For an SWS or a mixed system supplier: at least one sample each year.

BOARD NOTE: Derived from 40 CFR 141.23(c)(1)~~ (2016)~~.

b) SEP Application~~.~~

1) The supplier may apply to the Agency for a SEP that allows reduction from the monitoring frequencies specified in subsection (a) under subsections (d) through (f) and 35 Ill. Adm. Code 602.600~~ 602.200~~.

2) The supplier may apply to the Agency for a SEP that relieves it of the requirement for monitoring cyanide under subsections (d) through (f) and

35 Ill. Adm. Code 602.600 ~~602.200~~ if it can demonstrate that its system is not vulnerable due to a lack of any industrial source of cyanide.

BOARD NOTE Derived from 40 CFR 141.23(c)(2) and (c)(6)~~ (2016)~~.

c) SEP Procedures. The Agency must review the request under the SEP procedures of 35 Ill. Adm. Code 602.600 ~~602.200~~ based on consideration of the factors in subsection (e).

BOARD NOTE: Derived from 40 CFR 141.23(c)(6)~~ (2016)~~.

d) Standard for SEP Reduction ~~reduction~~ in Monitoring ~~monitoring~~. The Agency must grant a SEP that allows a reduction in the monitoring frequency if the supplier demonstrates that all previous analytical results were less than the MCL, provided the supplier meets the following minimum data requirements:

1) For GWS suppliers: a minimum of three rounds of monitoring.

2) For an SWS or mixed system supplier: annual monitoring for at least three years.

3) A supplier that uses a new water source is not eligible for a SEP until it completes three rounds of monitoring from the new source.

BOARD NOTE: Derived from 40 CFR 141.23(c)(4)~~ (2016)~~.

e) Standard for SEP Monitoring Conditions ~~monitoring conditions~~. As a condition of any SEP, the Agency must require that the supplier take a minimum of one sample during the term of the SEP. In determining the appropriate reduced monitoring frequency, the Agency must consider the following:

1) Reported concentrations from all previous monitoring;

2) The degree of variation in reported concentrations; and

3) Other factors that may affect contaminant concentrations, such as changes in groundwater pumping rates, changes in the CWS's configuration, the CWS's operating procedures, or changes in stream flows or characteristics.

BOARD NOTE: Derived from 40 CFR 141.23(c)(3) and (c)(5)~~ (2016)~~.

f) SEP Conditions and Revision~~.~~

1) A SEP will expire at the end of the compliance cycle for which it was issued.

BOARD NOTE: Derived from 40 CFR 141.23(c)(3)~~ (2016)~~.

2) In issuing a SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. A SEP must provide that the Agency will review and, where appropriate, revise its determination of the appropriate monitoring frequency when the supplier submits new monitoring data or when other data relevant to the supplier's appropriate monitoring frequency become available.

BOARD NOTE: Derived from 40 CFR 141.23(c)(6)~~ (2016)~~.

g) A supplier that exceeds the MCL as determined in Section 611.609, must monitor quarterly for that contaminant, beginning in the next quarter after the violation occurred.

BOARD NOTE: Derived from 40 CFR 141.23(c)(7)~~ (2016)~~.

h) Reduction of Quarterly Monitoring~~ quarterly monitoring.~~

1) The Agency must grant a SEP that reduces the monitoring frequency to that specified by subsection (a) if it determines that the sampling point is reliably and consistently below the MCL.

2) A request for a SEP must include the following minimal information:

A) For a GWS: two quarterly samples.

B) For an SWS or mixed system supplier: four quarterly samples.

3) In issuing the SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. Any SEP that allows less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring for any contaminant under subsection (g) if it violates the MCL specified by Section 611.609 for that contaminant.

BOARD NOTE: Derived from 40 CFR 141.23(c)(8)~~ (2016)~~.

i) A new system supplier or a supplier whose system uses a new source of water must demonstrate compliance with the MCL within a period of time specified by a permit issued the Agency. The supplier must also comply with the initial sampling frequencies specified by the Agency to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies must be conducted in accordance with the requirements in this Section.

BOARD NOTE: Derived from 40 CFR 141.23(c)(9)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.604 Nitrate Monitoring

Each supplier must monitor to determine compliance with the MCL for nitrate in Section 611.301.

a) Suppliers must monitor at the following frequencies:

1) CWSs and NTNCWSs.

A) GWSs: annually;

B) SWSs and mixed systems: quarterly.

BOARD NOTE: Derived from 40 CFR 141.23(d)(1)~~ (2016)~~.

2) Transient non-CWSs: annually.

BOARD NOTE: Derived from 40 CFR 141.23(d)(4)~~ (2016)~~.

b) Quarterly Monitoring ~~monitoring~~ for GWSs~~.~~

1) A CWS or NTNCWS supplier that is a GWS must initiate quarterly monitoring in the quarter following any one sample that has a nitrate concentration equal to or greater than 50 percent of the MCL.

2) The Agency must grant a SEP that reduces the monitoring frequency to annual after the supplier has completed quarterly sampling for at least four quarters if it determines that the sampling point is reliably and consistently below the MCL.

A) The request must include the following minimal information: the results from four consecutive quarterly samples.

B) In issuing the SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. All SEPs that allow less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring under ~~pursuant to~~ subsection (b)(1) if it violates the MCL specified by Section 611.301 for nitrate.

BOARD NOTE: Derived from 40 CFR 141.23(d)(2)~~ (2016)~~.

c) Reduction of Monitoring Frequency for SWSs and Mixed Systems ~~mixed systems.~~

1) The Agency must grant a SEP that allows a CWS or NTNCWS supplier that is a SWS or mixed system to reduce its monitoring frequency to

annually if it determines that all analytical results from four consecutive quarters are less than 50 percent of the MCL.

2) As a condition of the SEP, the Agency must require the supplier to initiate quarterly monitoring, beginning the next quarter, if any one sample is greater than or equal to 50 percent of the MCL.

BOARD NOTE: Derived from 40 CFR 141.23(d)(3) ~~(2016)~~.

d) This subsection corresponds with 40 CFR 141.23(d)(4), which the Board has codified at subsection (a)(2). This statement maintains structural consistency with USEPA rules.

e) After completion of four consecutive quarters of monitoring, each CWS or NTNCWS supplier monitoring annually must take samples during the quarters that resulted in the highest analytical result.

BOARD NOTE: Derived from 40 CFR 141.23(d)(5) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.605 Nitrite Monitoring

Each supplier must monitor to determine compliance with the MCL for nitrite in Section 611.301.

a) This subsection (a) corresponds with 40 CFR 141.23(e)(1), which was applicable only until a date now past. This statement maintains consistency with USEPA rules.

b) This subsection corresponds with 40 CFR 141.23(e)(2), a provision by which USEPA refers to state requirements that do not exist in Illinois. This statement maintains structural consistency with USEPA rules.

c) Monitoring Frequency ~~frequency.~~

1) Quarterly Monitoring ~~monitoring.~~

A) A supplier that has any one sample in which the concentration is equal to or greater than 50 percent of the MCL must initiate quarterly monitoring during the next quarter.

B) A supplier required to begin quarterly monitoring under subsection (c)(1)(A) must continue on a quarterly basis for a minimum of one year following any one sample exceeding the 50 percent of the MCL, after which the supplier may discontinue quarterly monitoring under ~~pursuant to~~ subsection (c)(2).

2) The Agency must grant a SEP that allows a supplier to reduce its monitoring frequency to annually if it determines that the sampling point is reliably and consistently below the MCL.

A) A request for a SEP must include the following minimal information: the results from four quarterly samples.

B) In issuing the SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. All SEPs that allow less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring for nitrite under subsection (c)(1) if it equals or exceeds 50 percent of the MCL specified by Section 611.301 for nitrite.

d) A supplier that is monitoring annually must take samples during the quarters that previously resulted in the highest analytical result.

BOARD NOTE: Derived from 40 CFR 141.23(e) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.611 Inorganic Analysis

Analytical methods are from documents incorporated by reference in Section 611.102. These are mostly referenced by a short name defined by Section 611.102(a). Other abbreviations are defined in Section 611.101.

a) Analysis for the following contaminants must be conducted using the following methods or an alternative method approved under ~~pursuant to~~ Section 611.480. Criteria for analyzing arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, nickel, selenium, sodium, and thallium with digestion or directly without digestion, and other analytical procedures, are contained in USEPA Technical Notes, incorporated by reference in Section 611.102.

BOARD NOTE: Because MDLs reported in USEPA ~~Environmental Metals Methods~~ 200.7 (94) and USEPA 200.9 (94) were determined using a 2× preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by USEPA ~~Environmental Metals Method~~ 200.7 (94), and arsenic by SM ~~Standard Methods, Method~~ 3120 B (89), SM 3120 B (93), or SM 3120 B (99), sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by USEPA ~~Environmental Metals Method~~ 200.9 (94); antimony and lead by SM ~~Standard Methods, Method~~ 3113 B (89), SM 3113 B (99), or SM 3113 B (10); and lead by ASTM ~~Method~~ D3559-96 D, ~~or~~ ASTM D3559-03 D, ASTM D3559-

08 D, or ASTM D3559-15 D, unless multiple in-furnace depositions are made.

1) Alkalinity~~.~~

A) Titrimetric. ASTM D1067-92 B, ASTM D1067-02 B, ASTM D1067-06 B, ASTM D1067-11 B, ASTM D1067-16 B, SM 2320 B (91), or SM 2320 B (97)

~~i) ASTM Method D1067-92 B, D1067-02 B, D1067-06 B, or D1067-11 B; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 2320 B.~~

B) Electrometric Titration. ~~titration:~~ USGS ~~Method~~ I-1030-85.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 2320 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 2320 B and ASTM Method D1067-11 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558).~~

2) Antimony~~.~~

A) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

B) Atomic Absorption, Hydride Technique. ~~absorption, hydride technique:~~ ASTM ~~Method~~ D3697-92, ASTM D3697-02, ASTM D3697-07, or ASTM D3697-12.

C) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10). ~~absorption, furnace technique:~~

~~i) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~ii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3697-07 as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908. USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Method 3113 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately. USEPA added ASTM Method D3697-12 as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

3) Arsenic~~.~~

BOARD NOTE: If ultrasonic nebulization is used in the determination of arsenic by USEPA ~~Method~~ 200.8 (94), the arsenic must be in the pentavalent state to provide uniform signal response. For direct analysis of arsenic with USEPA ~~Method~~ 200.8 (94) using ultrasonic nebulization, samples and standards must contain one mg/ℓ of sodium hypochlorite.

A) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

B) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

C) Atomic Absorption, Furnace Technique~~absorption, furnace technique~~. ASTM D2972-97 C, ASTM D2972-03 C, ASTM D2972-08 C, ASTM D2972-15 C, SM 3113 B (89), SM 3113 B (93), 3113 B (99), 3113 B (04), or 3113 B (10).

~~i) ASTM Method D2972-97 C, D2972-03 C, D2972-08 C, or D2972-15 C;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~iii) Standard Methods Online, Method 3113 B-04.~~

D) Atomic Absorption, Hydride Technique~~absorption, hydride technique~~. ASTM D2972-97 B, ASTM D2972-03 B, ASTM D2972-08 B, ASTM D2972-15 B, SM 3114 B (89), SM 3114 B

(93), SM 3114 B (97), SM 3114 B (04), or SM 3114 B (09).

~~i) ASTM Method D2972-97 B, D2972-03 B C, D2972-08 B, or D2972-15 B;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3114 B; or~~

~~iii) Standard Methods Online, Method 3114 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES): USEPA ~~NERL Method~~ 200.5 (94).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3114 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D2972-08 B and C as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods Online, Method 3113 B-04 and Method 3114 B-09 as an approved alternative methods on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3113 B and 3114 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). Because Standard Methods, 22nd ed., Method 3114 B is the same version as Standard Methods Online 3114 B-09, the Board has not listed the Standard Methods Online version separately. USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Methods D2972-15 B and C as approved alternative methods on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

4) Asbestos.~~:~~ Transmission Electron Microscopy. ~~electron microscopy:~~ USEPA ~~Asbestos Method~~ 100.1 (83) or USEPA ~~Asbestos Method~~ 100.2 (94).

5) Barium~~.~~

A) Inductively Coupled Plasma ~~coupled plasma~~. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Direct Aspiration Technique. ~~absorption, direct aspiration technique:~~ SM ~~Standard Methods, 18th, 19th, 21st, or 22nd ed., Method~~ 3111 D (89), SM 3111 D (93), or SM 3111 D (99).

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10). ~~absorption, furnace technique:~~

~~i) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~ii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES): USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111D, 3113B, and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 D, 3113 B, and 3120 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

6) Beryllium~~.~~

A) Inductively Coupled Plasma ~~coupled plasma~~. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods,~~

~~Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Atomic Absorption, Furnace Technique ~~absorption, furnace technique~~. ASTM D3645-97 B, ASTM D3645-03 B, ASTM D3645-08 B, ASTM D3645-15 B, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

~~i) ASTM Method D3645-97 B, D3645-03 B, D3645-08 B, or D3645-15 B;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~iii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3645-08 B as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3113 B and 3120 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D3645-15 B as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

7) Cadmium~~.~~

A) Inductively Coupled Plasma Arc Furnace. ~~coupled plasma arc furnace:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.7 (94) ~~(rev. 4.4)~~.

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10). ~~absorption, furnace technique:~~

~~i) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~ii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Method 3113 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

8) Calcium~~.~~

A) EDTA Titrimetric ~~titrimetric~~. ASTM D511-93 A, ASTM D511-03 A, ASTM D511-09 A, ASTM D511-14 A, SM 3500-Ca B (97), or 3500-Ca D (91).

~~i) ASTM Method D511-93 A, D511-03 A, D511-09 A, or D511-14 A; or~~

~~ii) Standard Methods, 18th or 19th ed., Method 3500-Ca D or Standard Methods, 20th, 21st, or 22nd ed., Method 3500-Ca B.~~

B) Atomic Absorption, Direct Aspiration ~~absorption, direct aspiration~~. ASTM D511-93 B, ASTM D511-03 B, ASTM D511-09 B, ASTM D511-14 B, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

~~i) ASTM Method D511-93 B, D511-03 B, D511-09 B, or D511-14 B; or~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3111 B.~~

C) Inductively Coupled Plasma ~~coupled plasma~~. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

D) Ion Chromatography. ~~chromatography:~~ ASTM ~~Method~~ D6919-03 or ASTM D6919-09.

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111B, 3120 B, and 3500-Ca B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D511-09 A and B as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added ASTM Method D6919-09 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 B, 3120 B, and 3500-Ca B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM Method D511-14 A and B as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839).~~

9) Chromium~~.~~

A) Inductively Coupled Plasma ~~coupled plasma~~. USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals~~

~~Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10). ~~absorption, furnace technique:~~

~~i) Standard Methods, 18th, 19th, 21st, or 22nd, or 23rd ed., Method 3113 B; or~~

~~ii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3113 B and 3120 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

10) Copper~~.~~

A) Atomic Absorption, Furnace Technique ~~absorption, furnace technique~~. ASTM D1688-95 C, ASTM D1688-02 C, ASTM D1688-07 C, ASTM D1688-12 C, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), and SM 3113 B (10).

~~i) ASTM Method D1688-95 C, D1688-02 C, D1688-07 C, or D1688-12 C;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~iii) Standard Methods Online, Method 3113 B-04.~~

B) Atomic Absorption, Direct Aspiration ~~absorption, direct aspiration~~. ASTM D1688-95 A, ASTM D1688-02 A, ASTM D1688-07 A, ASTM D1688-12 A, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

~~i) ASTM Method D1688-95 A, D1688-02 A, D1688-07 A, or D1688-12 A; or~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3111 B.~~

C) Inductively Coupled Plasma ~~coupled plasma~~ USEPA 200.7 (94), SM 3120 B (83), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

D) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

E) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

F) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

G) Colorimetric.~~:~~ Hach ~~Method~~ 8026 (15) or Hach 10272 (15).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111B, 3113 B, and 3120 B and USEPA NERL Method 200.5 as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D1688-07 A and C as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 B, 3113 B, and 3120 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately. USEPA added ASTM Method D1688-12 A and C and Hach Methods 8026 and 10272 as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839).~~

11) Conductivity; Conductance. ASTM D1125-95(1999) A, ASTM D1125-14 A, SM 2510 B (91), or SM 2510 B (97).

~~A) ASTM Method D1125-95(1999) A or D1125-14 A; or~~

~~B) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 2510 B.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 2510 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 2510 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM Method D1125-14 A as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839).~~

12) Cyanide~~.~~

A) Manual Distillation with $MgCl_2$. ~~distillation~~ (ASTM ~~Method~~ D2036-98 A, ASTM D2036-06 A, SM ~~or Standard Methods, 18th, 19th, or 20th ed., Method~~ 4500-CN^- C (90), SM 4500-CN^- C (97), SM 4500-CN^- C (99), or SM 4500-CN^- C (16)), followed by spectrophotometric, amenable (ASTM D2036-98 B, ASTM D2036-06 B, SM 4500-CN^- G (90), SM 4500-CN^- G (97), SM 4500-CN^- G (99), or SM 4500-CN^- G (16)).~~:~~

~~i) ASTM Method D2036-98 B or D2036-06 B; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-CN- G.~~

B) Manual Distillation with $MgCl_2$. Distillation ~~distillation~~ (ASTM ~~Method~~ D2036-98 A or ASTM D2036-06 A or SM ~~Standard Methods, 18th, 19th, or 20th ed., Method~~ 4500-CN^- C (90), SM 4500-CN^- C (97), SM 4500-CN^- C (99), or SM 4500-CN^- C (16)), Followed ~~followed~~ by Spectrophotometric, Manual (ASTM D2036-98 A, ASTM D2036-06 A, SM 4500-CN^- E (90), 4500-CN^- E (97), 4500-CN^- E (99), 4500-CN^- E (16), or USGS I-3300-85) ~~spectrophotometric, manual~~.

~~i) ASTM Method D2036-98 A or D2036-06 A;~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd, or 23rd ed., Method 4500-CN- E; or~~

~~iii) USGS Method I-3300-85.~~

C) Spectrophotometric, Semiautomated. ~~semiautomated:~~ USEPA ~~Environmental Inorganic Methods, Method~~ 335.4 (93) ~~(rev. 1.0)~~.

D) Selective Electrode. ~~electrode:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st,or 22nd ed., Method~~ 4500-CN^- F (90), SM 4500-CN^- F

(97), SM 4500-CN$^-$ F (99), or SM 4500-CN$^-$ F (16).

E) UV/Distillation/Spectrophotometric.~~:~~ Kelada 01 (01).

F) Microdistillation/Flow Injection/Spectrophotometric.~~:~~ QuikChem 10-204-00-1-X (00).

G) Ligand Exchange ~~exchange~~ and Amperometry ~~amperometry~~. ASTM D6888-04 or OIA-1677 DW (04).

~~i) ASTM Method D6888-04.~~

~~ii) OI Analytical Method OIA-1677 DW.~~

H) Gas Chromatography-Mass Spectrometry Headspace. ~~chromatography-mass spectrometry headspace: Method~~ ME355.01 (09).

~~BOARD NOTE: USEPA added ASTM Method D2036-06 A and Standard Methods, 21st ed., Methods 4500-CN$^-$ E, F, and G as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Method ME355.01 as an approved alternative method on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added Standard Methods, 22nd ed., Methods 4500-CN- E, F, and G as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558).~~

13) Fluoride~~.~~

A) Ion Chromatography. USEPA 300.0 (93), USEPA 300.1 (97), ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, SM 4110 B (90), SM 4110 B (91), SM 4110 B (97), or SM 4110 B (00).

~~i) USEPA Environmental Inorganic Methods, Method 300.0 (rev. 2.1) or USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0);~~

~~ii) ASTM Method D4327-97, D4327-03, or D4327-11;~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4110 B; or~~

~~iv) Hach SPADNS 2 Method 10225.~~

B) Manual Distillation, Colorimetric ~~distillation, colorimetric~~ SPADNS.~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 4500-F$^-$ B (88), SM 4500-F$^-$ B (94), SM 4500-F$^-$ B (97), SM 4500-F$^-$, ~~and~~ D (88), SM 4500-F$^-$ B (94), or SM 4500-F$^-$ B (97).

C) Manual Electrode ~~electrode~~. ASTM D1179-93 B, ASTM D1179-99 B, ASTM D1179-04 B, ASTM D1179-10 B, ASTM D1179-16 B, SM 4500-F$^-$ C (88), SM 4500-F$^-$ C (94), or SM 4500-F$^-$ C (97).

~~i) ASTM Method D1179-93 B, D1179-99 B, D1179-04 B, or D1179-10 B; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-F$^-$ C.~~

D) Automated Electrode. ~~electrode:~~ Technicon #~~Methods, Method~~ 380-75WE (76).

E) Automated Alizarin ~~alizarin~~. SM 4500-F$^-$ E (88), SM 4500-F$^-$ E (94), SM 4500-F$^-$ E (97), or Technicon #129-71W.

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-F$^-$ E; or~~

~~ii) Technicon Methods, Method 129-71W.~~

F) Arsenite-Free Colorimetric SPADNS. Hach 10225 (11) (SPADNS 2).

G~~F~~) Capillary Ion Electrophoresis. ~~ion electrophoresis:~~ ASTM ~~Method~~ D6508-00~~(2005)~~.

BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride to add capillary ion electrophoresis in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of "Waters Method D6508, Rev. 2". ~~The Board attempt to locate a copy of the method disclosed that it is an ASTM method originally approved in 2000 and reapproved in 2005.~~ The Board has cited to the ASTM Method D6508-00(2005). On May 2, 2012, USEPA changed the entries for nitrate, nitrite, and orthophosphate to ASTM D6508-00.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B and 4500-F$^-$ B, C, D, and E and ASTM Method D1179-04 B as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Hach SPADNS 2 Method 10225 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added ASTM Method D1179-10 B as an approved alternative method on June 28, 2012 (at 77 Fed. Reg. 38523). USEPA added Standard Methods, 22nd ed., Methods 4110 B and 4500-F- B, C, D, and E as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM Method D4327-11 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081).~~

14) Lead~~.~~

A) Atomic Absorption, Furnace Technique~~ absorption, furnace technique~~. ASTM D3559-96 D, ASTM D3559-03 D, ASTM D3559-08 D, ASTM D3559-15 D, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

~~i) ASTM Method D3559-96 D, D3559-03 D, D3559-08 D, or D3559-08 D;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~iii) Standard Methods Online, Method 3113 B-04.~~

B) Inductively Coupled Plasma-Mass Spectrometry.~~ coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique.~~ absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Differential Pulse Anodic Stripping Voltammetry.~~:~~ Palintest ~~Method~~ 1001 (99).

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3559-08 D as an approved alternative method on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Method 3113 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Method D3559-08 D as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

15) Magnesium~~.~~

A) Atomic Absorption ~~absorption~~. ASTM D511-93 B, ASTM D511-03 B, ASTM D511-09 B, ASTM D511-14 B, SM 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

~~i) ASTM Method D511-93 B, D511-03 B, D511-09 B, or D511-14 B; or~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3111 B.~~

B) Inductively Coupled Plasma ~~coupled plasma~~. USEPA 200.7 (94), SM 3120 B (89), SM 3120 B (93), or SM 3120 B (99).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

C) Complexation Titrimetric ~~titrimetric~~. ASTM D511-93 A, ASTM D511-03 A, ASTM D511-09 A, ASTM D511-14 A, SM 3500-Mg B (97), SM 3500-Mg E (90), or SM 3500-Mg E (91).

~~i) ASTM Method D511-93 A, D511-03 A, D511-09 A, or D511-14 A; or~~

~~ii) Standard Methods, 18th or 19th ed., Method 3500-Mg E or Standard Methods, 20th, 21st, or 22nd ed., Method 3500-Mg B.~~

D) Ion Chromatography. ~~chromatography:~~ ASTM ~~Method~~ D6919-03 or ASTM D6919-09.

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111B, 3120 B, and 3500-Mg B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D511-09 A and B as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added ASTM Method D6919-09 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 B, 3120 B, and 3500-Mg B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM Method D511-14 A and B as approved alternative methods on July 19, 2016 (at 81 Fed. Reg. 46839).~~

16) Mercury~~.~~

A) Manual Cold Vapor Technique ~~cold vapor technique~~. ASTM D3223-97, ASTM D3223-02, ASTM D3223-12, SM 3112 B (88), SM 3112 B (93), SM 3112 B (99), SM 3112 B (09), or USEPA 245.1 (91).

~~i) USEPA Environmental Metals Methods, Method 245.1 (rev. 3.0);~~

~~ii) ASTM Method D3223-97, D3223-02, or D3223-12; or~~

~~iii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3112 B.~~

B) Automated Cold Vapor Technique. ~~cold vapor technique:~~ USEPA ~~Inorganic Methods, Method~~ 245.2 (74).

C) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3112 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3112 B-09 as an approved alternative method on June 28, 2012 (at 77 Fed. Reg. 38523). USEPA added Standard Methods, 22nd ed., Method 3112 B as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). Because Standard Methods, 22nd ed., Method 3112 B is the same version as Standard Methods Online 3112 B-09, the Board has not listed the Standard Methods Online version separately. USEPA added ASTM D3223-B-12 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081).~~

17) Nickel~~.~~

A) Inductively Coupled Plasma ~~coupled plasma~~. SM 3120 B (89), SM 3120 B (93), SM 3120 B (99), or USEPA 200.7 (94).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique.~~ absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94)~~ (rev. 2.2)~~.

D) Atomic Absorption, Direct Aspiration Technique.~~ absorption, direct aspiration technique:~~ SM ~~Standard Methods, 18th, 19th, 21st, or 22nd ed., Method~~ 3111 B (89), 3111 B (93), or 3111 B (99).

E) Atomic Absorption, Furnace Technique. SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).~~ absorption, furnace technique:~~

~~i) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~ii) Standard Methods Online, Method 3113 B-04.~~

F) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111 B, 3113 B, and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 B, 3113 B, and 3120 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

18) Nitrate~~.~~

A) Ion Chromatography~~ chromatography~~. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, SM 4110 B (90), SM 4110 B (97), SM 4110 B (00), or USEPA 300.0 (93), USEPA 300.1 (97), Waters B-1011 (87).

~~i) USEPA Environmental Inorganic Methods, Method 300.0 (rev. 2.1) or USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0);~~

~~ii) ASTM Method D4327-97,D4327-03, or D4327-11;~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4110 B; or~~

~~iv) Waters Method B-1011, available from Millipore Corporation.~~

B) Automated Cadmium Reduction ~~cadmium reduction~~. ASTM D3867-90 A; SM 4500-NO_3^- F (88), 4500-NO_3^- F (93), 4500-NO_3^- F (97), 4500-NO_3^- F (00), 4500-NO_3^- F (16) or USEPA 353.2 (93).

~~i) USEPA Environmental Inorganic Methods, Method 353.2 (rev. 2.0);~~

~~ii) ASTM Method D3867-90 A; or~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-NO_3^- F.~~

C) Ion Selective Electrode ~~selective electrode~~. ATI Orion Technical Bulletin 601 (94), SM 4500-NO_3^- D (88), SM 4500-NO_3^- D (93), SM 4500-NO_3^- D (97), SM 4500-NO_3^- D (00), or SM 4500-NO_3^- D (16).

~~i) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-NO_3^- D; or~~

~~ii) Technical Bulletin 601.~~

D) Manual Cadmium Reduction ~~cadmium reduction~~. ASTM D3867-90 B, SM 4500-NO_3^- E (88), SM 4500-NO_3^- E (93), SM 4500-NO_3^- E (97), SM 4500-NO_3^- E (00), or SM 4500-NO_3^- E (16).

~~i) ASTM Method D3867-90 B; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-NO_3^- E.~~

E) Capillary Ion Electrophoresis. ~~ion electrophoresis:~~ ASTM ~~Method~~ D6508-00~~(2005)~~ or ASTM D6508-15.

F) Reduction-Colorimetric: ~~Reduction-colorimetric.~~ Systea Easy (1-Reagent) (09) or NECi Nitrate-Reductase (06) ~~Method~~.

G) Direct Colorimetric. ~~colorimetric:~~ Hach 10206 (TNTplus 835/836) ~~Method 10206~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods~~

~~4110 B and 4500-NO_3^- D, E, and F as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Systea Easy (1-Reagent) as an approved alternative method on August 3, 2009 (at 73 Fed. Reg. 38348). USEPA added Hach TNTplus 835/836 Method 10206 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 4110 B and 4500-NO_3^- D, E, and F as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM D4327-11 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added NECi Nitrate-Reductase Method as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839). USEPA added ASTM Method D6508-15 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

19) Nitrite~~.~~

A) Ion Chromatography ~~chromatography~~. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, SM 4110 B (90), SM 4110 B (97), or SM 4110 B (00), USEPA 300.0 (93), USEPA 300.1 (97), or Waters B-1011 (87).

~~i) USEPA Environmental Inorganic Methods, Method 300.0 (rev. 2.1) or USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0);~~

~~ii) ASTM Method D4327-97, D4327-03, or D4327-11;~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4110 B; or~~

~~iv) Waters Method B-1011, available from Millipore Corporation.~~

B) Automated Cadmium Reduction ~~cadmium reduction~~. ASTM D3867-90 A, SM 4500-NO_3^- F (93), 4500-NO_3^- F (97), 4500-NO_3^- F (00), 4500-NO_3^- F (16), or USEPA 353.2 (93).

~~i) USEPA Environmental Inorganic Methods, Method 353.2 (rev. 2.0);~~

~~ii) ASTM Method D3867-90 A; or~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-NO_3^- F.~~

C) Manual Cadmium Reduction ~~cadmium reduction~~. ASTM D3867-90 B, SM 4500-NO_3^- E (93), 4500-NO_3^- E (97), 4500-NO_3^- E (00), or 4500-NO_3^- E (16).

~~i) ASTM Method D3867-90 B; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-NO_3^- E.~~

D) Spectrophotometric.~~:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st,or 22nd ed., Method~~ 4500-NO_2^- B (88), 4500-NO_2^- B (93), or 4500-NO_2^- B (00).

E) Capillary Ion Electrophoresis.~~ ion electrophoresis:~~ ASTM ~~Method~~ D6508-00~~(2005),~~ or ASTM D6508-15.

F) Reduction-Colorimetric: ~~Reduction-colorimetric.~~ Systea Easy (1-Reagent) (09) or NECi Nitrate-Reductase (06) ~~Method~~.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B, 4500-NO_3^- E and F; and 4500-NO_2^- B as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Systea Easy (1-Reagent) as an approved alternative method on August 3, 2009 (at 73 Fed. Reg. 38348). USEPA added Standard Methods, 22nd ed., Methods 4110 B, 4500-NO_3^- E and F, and 4500-NO_2^- B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM D4327-11 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added NECi Nitrate-Reductase Method as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839). USEPA added ASTM Method D6508-15 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

20) Orthophosphate (unfiltered, without digestion or hydrolysis)~~.~~

A) Automated Colorimetric, Ascorbic Acid ~~colorimetric, ascorbic acid~~. SM 4500-P F (88), SM 4500-P F (93), SM 4500-P F (97), SM 4500-P F (99), SM 4500-P F (05), Thermo-Fisher Discrete Analyzer (16), or USEPA 365.1 (93).

~~i) USEPA Environmental Inorganic Methods, Method 365.1 (rev. 2.0);~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-P F; or~~

~~iii) Thermo-Fisher Discrete Analyzer.~~

B) Single-Reagent Colorimetric, Ascorbic Acid~~Single reagent colorimetric, ascorbic acid~~. ASTM D515-88 A, SM 4500-P E (88), 4500-P E (93), 4500-P E (97), or 4500-P E (99), or 4500-P E (05).

~~i) ASTM Method D515-88 A; or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-P E.~~

C) Colorimetric, Phosphomolybdate. ~~phosphomolybdate:~~ USGS ~~Method~~ I-1601-85.

D) Phosphorus, Orthophosphate, Colorimetry, Phosphomolybdate, Automated-Segmented Flow. ~~orthophosphate, colorimetry, phosphomolybdate, automated-segmented flow:~~ USGS ~~Method~~ I-2601-90.

E) Colorimetric, Phosphomolybdate, Automated Discrete. ~~phosphomolybdate, automated discrete:~~ USGS ~~Method~~ I-2598-85.

F) Ion Chromatography. ASTM D4327-97, ASTM D4327-03, ASTM D4327-11, SM 4110 B (90), SM 4110 B (91), SM 4110 B (97), SM 4110 B (00), USEPA 300.0 (93), or USEPA 300.1 (97).

~~i) USEPA Environmental Inorganic Methods, Method 300.0 (rev. 2.1) or USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0);~~

~~ii) ASTM Method D4327-97, D4327-03, or D4327-11; or~~

~~iii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4110 B.~~

G) Capillary Ion Electrophoresis. ~~ion electrophoresis:~~ ASTM ~~Method~~ D6508-00~~(2005),~~ or ASTM D6508-15.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B and 4500-P E and F as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). Because Standard Methods, 21st ed., Methods 4500-P E and F are the same versions as Standard Methods Online 4500-P E-99 and F-99, the Board has not listed the Standard Methods Online versions separately. USEPA added Standard Methods, 22nd ed., Methods 4500-P E and F and 4110 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added ASTM D4327-11 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added Thermo-Fisher Discrete Analyzer as an approved alternative method on July 19, 2016 (at 81 Fed. Reg. 46839). USEPA added ASTM Method D6508-15 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

21) pH, Electrometric~~: electrometric~~. ASTM D1293-95, ASTM D1293-99, ASTM D1293-12, SM 4500-H$^+$ B (90), SM 4500-H$^+$ B (96), SM 4500-H$^+$

B (00), USEPA 150.1 (71), USEPA 150.2 (82), or USEPA 150.3 (13).

~~A) USEPA Inorganic Methods, Method 150.1 or Method 150.2;~~

~~B) ASTM Method D1293-95, D1293-99, or D1293-12; or~~

~~C) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 4500-H$^+$ B.~~

~~D) USEPA Method 150.3.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 4500-H$^+$ B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 4500-H$^+$ B and ASTM Method D1293-12 as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added USEPA Method 150.3 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

22) Selenium~~.~~

A) Atomic Absorption, Hydride ~~absorption, hydride~~. ASTM D3859-98 A, ASTM D3859-03 A, ASTM D3859-08 A, ASTM D3859-15 A, SM 3114 B (89), SM 3114 (93), SM 3114 (97), or SM 3114 (09).

~~i) ASTM Method D3859-98 A, D3859-03 A, D3859-08 A, or D3859-15 A; or~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3114 B.~~

B) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

C) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

D) Atomic Absorption, Furnace Technique ~~absorption, furnace technique~~. ASTM D3859-98 B, ASTM D3859-03 B, ASTM D3859-08 B, ASTM D3859-15 B, SM 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).

~~i) ASTM Method D3859-98 B, D3859-03 B, D3859-08 B, or D3859-15 B;~~

~~ii) Standard Methods, 18th, 19th, 21st, or 22nd ed., Method 3113 B; or~~

~~iii) Standard Methods Online, Method 3113 B-04.~~

E) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3114 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3859-08 A and B as approved alternative methods on November 10, 2009 (at 74 Fed. Reg. 57908). USEPA added Standard Methods Online, Method 3113 B-04 and Method 3114 B-09 as approved alternative methods on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3113 B and 3114 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). Because Standard Methods, 22nd ed., Method 3114 B is the same version as Standard Methods Online 3114 B-09, the Board has not listed the Standard Methods Online version separately. USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added ASTM Methods D3859-15 A and B as approved alternative methods on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

23) Silica~~.~~

A) Colorimetric, Molybdate Blue. ~~molybdate blue:~~ USGS ~~Method~~ I-1700-85.

B) Colorimetric, Molybdate Blue, Automated-Segmented Flow. ~~molybdate blue, automated-segmented flow:~~ USGS ~~Method~~ I-2700-85.

C) Colorimetric.~~:~~ ASTM ~~Method~~ D859-94, ASTM D859-00, ASTM D859-05, ASTM ~~or~~ D859-10, or ASTM D859-16.

D) Molybdosilicate.~~:~~ SM ~~Standard Methods, 18th or 19th ed., Method~~ 4500-Si D (88), SM 4500-Si D (93), or SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 4500-SiO_2 C (97).

E) Heteropoly Blue. ~~blue:~~ SM ~~Standard Methods, 18th or 19th ed., Method~~ 4500-Si E (88), SM 4500-Si E (93), or SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 4500-SiO_2 D (97).

F) Automated Method ~~method~~ for Molybdate-Reactive Silica. ~~molybdate-reactive silica:~~ SM ~~Standard Methods, 18th or 19th ed., Method~~ 4500-Si F (88), SM 4500-Si F (93), or SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 4500-SiO_2 E (97).

G) Inductively Coupled Plasma ~~coupled plasma~~. SM 3120 B (89), SM 3120 B (93), SM 3120 B (99), or USEPA 200.7 (94).

~~i) USEPA Environmental Metals Methods, Method 200.7 (rev. 4.4); or~~

~~ii) Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 3120 B.~~

H) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added ASTM Method D859-05, Standard Methods, 21st ed.; Methods 3120 B and 4500-SiO~~$_2$~~ C, D, and E; and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D859-10 as an approved alternative method on June 28, 2012 (at 77 Fed. Reg. 38523). USEPA added Standard Methods, 22nd ed., Methods 3120 B and 4500-SiO~~$_2$~~ C, D, and E as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558).~~

24) Sodium~~.~~

A) Inductively Coupled Plasma. ~~coupled plasma:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.7 (94) ~~(rev. 4.4)~~.

B) Atomic Absorption, Direct Aspiration. ~~absorption, direct aspiration:~~ SM ~~Standard Methods, 18th, 19th, 21st, or 22nd ed., Method~~ 3111 B (89), SM 3111 B (93), or SM 3111 B (99).

C) Ion Chromatography. ~~chromatography:~~ ASTM ~~Method~~ D6919-03 or ASTM D6919-09.

D) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3111 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D6919-09 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Method 3111 B~~

~~as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558).~~

25) Temperature; Thermometric. ~~thermometric:~~ SM ~~Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method~~ 2550 (88), SM 2550 (93), SM 2550 (00), or SM 2550 (10).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 2550 as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 2550 as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 2550-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 2550 is the same version as Standard Methods Online, Method 2550-10, the Board has not listed the Standard Methods Online versions separately.~~

26) Thallium~~.~~

A) Inductively Coupled Plasma-Mass Spectrometry. ~~coupled plasma-mass spectrometry:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.8 (94) ~~(rev. 5.3)~~.

B) Atomic Absorption, Platform Furnace Technique. ~~absorption, platform furnace technique:~~ USEPA ~~Environmental Metals Methods, Method~~ 200.9 (94) ~~(rev. 2.2)~~.

b) Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under ~~pursuant to~~ Sections 611.600 through 611.604 must be conducted using the following sample preservation, container, and maximum holding time procedures:

BOARD NOTE: For cyanide determinations samples must be adjusted with sodium hydroxide to pH 12 at the time of collection. When chilling is indicated the sample must be shipped and stored at 4° C or less. Acidification of nitrate or metals samples may be with a concentrated acid or a dilute (50% by volume) solution of the applicable concentrated acid. Acidification of samples for metals analysis is encouraged and allowed at the laboratory rather than at the time of sampling provided the shipping time and other instructions in Section 8.3 of USEPA ~~Environmental Metals Method~~ 200.7 (94), USEPA 200.8 (94), or USEPA 200.9 (94) are followed.

1) Antimony~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

2) Arsenic~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

3) Asbestos~~.~~

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 48 hours.

4) Barium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

5) Beryllium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

6) Cadmium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

7) Chromium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

8) Cyanide~~.~~

A) Preservative: Cool to 4° C. Add sodium hydroxide to pH greater than 12. See the analytical methods for information on sample preservation.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

9) Fluoride~~.~~

A) Preservative: None.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within one month.

10) Mercury~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 28 days.

11) Nickel~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time. ~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

12) Nitrate, chlorinated ~~chlorinated.~~

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time.~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

13) Nitrate, Non-Chlorinated~~non-chlorinated.~~

A) Preservative: Concentrated sulfuric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time.~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

14) Nitrite~~.~~

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding Time.~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within 48 hours.

15) Selenium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time.~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

16) Thallium~~.~~

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding Time.~~time:~~ Samples must be analyzed as soon after collection as possible, but in any event within six months.

c) Analyses under this Subpart N must be conducted by a certified laboratory in one of the categories listed in Section 611.490(a). The Agency must certify laboratories to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium if the laboratory does as follows:

1) It analyzes performance evaluation (PE) samples, provided by the Agency under ~~pursuant to~~ 35 Ill. Adm. Code 186, that include those substances at

levels not in excess of levels expected in drinking water; and

2) It achieves quantitative results on the analyses within the following acceptance limits:

A) Antimony: ± 30% at greater than or equal to 0.006 mg/ℓ.

B) Arsenic: ± 30% at greater than or equal to 0.003 mg/ℓ.

C) Asbestos: 2 standard deviations based on study statistics.

D) Barium: ± 15% at greater than or equal to 0.15 mg/ℓ.

E) Beryllium: ± 15% at greater than or equal to 0.001 mg/ℓ.

F) Cadmium: ± 20% at greater than or equal to 0.002 mg/ℓ.

G) Chromium: ± 15% at greater than or equal to 0.01 mg/ℓ.

H) Cyanide: ± 25% at greater than or equal to 0.1 mg/ℓ.

I) Fluoride: ± 10% at 1 to 10 mg/ℓ.

J) Mercury: ± 30% at greater than or equal to 0.0005 mg/ℓ.

K) Nickel: ± 15% at greater than or equal to 0.01 mg/ℓ.

L) Nitrate: ± 10% at greater than or equal to 0.4 mg/ℓ.

M) Nitrite: ± 15% at greater than or equal to 0.4 mg/ℓ.

N) Selenium: ± 20% at greater than or equal to 0.01 mg/ℓ.

O) Thallium: ± 30% at greater than or equal to 0.002 mg/ℓ.

BOARD NOTE: Derived from 40 CFR 141.23(k) and appendix A to subpart C of 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 2320 B-97 appears in the 21st, 22nd, and 23rd editions as Method 2320 B. In this Section, this appears as SM 2320 B (97).

Standard Methods Online, Method 2510 B-97 appears in the 20th, 21st, 22nd, and 23rd editions as Method 2510 B. In this Section, this appears as SM 2510 B (97).

Standard Methods Online, Method 2550-00 appears in the 21st edition as Method 2550. In this Section, this appears as SM 2550 (00).

Standard Methods Online, Method 2550-10 appears in the 22nd edition as Method 2550. In this Section, this appears as SM 2550 (10).

Standard Methods Online, Methods 3111 B-99 and 3111 D-99 appear in the 21st, 22nd, and 23rd editions as Methods 3111 B and 3111 D. In this Section, these appear as SM 3111 B (99) and SM 3111 D (99).

Standard Methods Online, Method 3112 B-09 appears in the 22nd and 23rd editions as Method 3112 B. In this Section, this appears as SM 3112 B (09).

Standard Methods Online, Method 3113 B-99 appears in the 21st edition as Method 3113 B. In this Section, this appears as SM 3113 B (99).

Standard Methods Online, Method 3113 B-10 appears in the 22nd and 23rd editions as Method 3113 B. In this Section, this appears as SM 3113 B (10).

Standard Methods Online, Method 3114 B-97 appears in the 21st edition as Method 3114 B. In this Section, this appears as SM 3114 B (97).

Standard Methods Online, Method 3114 B-09 appears in the 22nd and 23rd editions as Method 3114 B. In this Section, this appears as SM 3114 B (09).

Standard Methods Online, Method 3120 B-99 appears in the 21st edition as Method 3120 B. In this Section, this appears as SM 3120 B (99).

Standard Methods Online, Methods 3500-Ca B-97 and 3500-Ca D-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 3500-Ca B and 3500-Ca D. In this Section, these appear as SM 3500-Ca B (97) and SM 3500-Ca D (97).

Standard Methods Online, Method 3500-Mg B-97 appears in the 20th, 21st, 22nd, and 23rd editions as Method 3500-Mg B. In this Section, this appears as SM 3500-Mg B (97).

Standard Methods Online, Method 4110 B-00 appears in the 21st, 22nd, and 23rd editions as Method 4110 B. In this Section, this appears as SM 4110 B (00).

Standard Methods Online, Methods 4500-CN$^-$ C-90, 4500-CN$^-$ E-90, 4500-CN$^-$ F-90, and 4500-CN$^-$ G-90 appear in the 18th and 19th editions as Methods 4500-CN$^-$ C, 4500-CN$^-$ E, 4500-CN$^-$ F, and 4500-CN$^-$ G. In this Section, these appear as SM 4500-CN$^-$ C (90), SM 4500-CN$^-$ E (90), SM 4500-CN$^-$ F (90), and SM 4500-CN$^-$ G (90).

Standard Methods Online, Methods 4500-CN$^-$ C-99, 4500-CN$^-$ E-99, 4500-CN$^-$ F-99, and 4500-CN$^-$ G-99 appear in the 21st and 22nd editions as Methods 4500-CN$^-$ C, 4500-CN$^-$ E, 4500-CN$^-$ F, and 4500-CN$^-$ G. In this Section, these appear as SM 4500-CN$^-$ C (99), SM 4500-CN$^-$ E (99), SM 4500-CN$^-$ F (99), and SM 4500-CN$^-$ G (99).

Standard Methods Online, Methods 4500-F$^-$ B-97, 4500-F$^-$ C-97, 4500-F$^-$ D-97, and 4500-F$^-$ E-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 4500-F$^-$ B, 4500-F$^-$ C, 4500-F$^-$ D, and 4500-F$^-$ E. In this Section, these appear as SM 4500-F$^-$ B (97), SM 4500-F$^-$ C (97), SM 4500-F$^-$ D (97), and SM 4500-F$^-$ E (97).

Standard Methods Online, Methods 4500-NO_3^- D-00, 4500-NO_3^- E-00, and 4500-NO_3^- F-00 appear in the 21st, 22nd, and 23rd editions as Methods 4500-NO_3^- D, 4500-NO_3^- E, and 4500-NO_3^- F. In this Section, these appear as SM 4500-NO_3^- D (00), SM 4500-NO_3^- E (00), and SM 4500-NO_3^- F (00).

Standard Methods Online, Methods 4500-NO_2^- B-00 appears in the 21st, 22nd, and 23rd editions as Method 4500-NO_2^- B. In this Section, this appears as SM 4500-NO_2^- B (00).

Standard Methods Online, Method 4500-H^+ B-90 appears in the 18th and 19th editions as Method 4500-H^+ B. In this Section, this appears as SM 4500-H^+ B (90).

Standard Methods Online, Method 4500-H^+ B-00 appears in the 21st, 22nd, and 23rd editions as Method 4500-H^+ B. In this Section, this appears as SM 4500-H^+ B (00).

Standard Methods Online, Methods 4500-P E-99 and 4500-P F-99 appear in the 21st and 22nd editions as Methods 4500-P E and 4500-P F. In this Section, these appear as SM 4500-P E (97) and SM 4500-P F (97).

Standard Methods Online, Methods 4500-SiO_2 C-97, 4500-SiO_2 D-97, and 4500-SiO_2 E-97 appear in the 20th, 21st, 22nd, and 23rd editions as Methods 4500-SiO_2 C, 4500-SiO_2 D, and 4500-SiO_2 E. In this Section, these appear as SM 4500-SiO_2 C (97), SM 4500-SiO_2 D (97), and SM 4500-SiO_2 E (97).

Standard Methods Online, Method 6251 B-07 appears in the 22nd and 23rd editions as Method 6251 B. In this Section, this appears as SM 6251 B (07).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.612 Monitoring Requirements for Old Inorganic MCLs

a) Analyses for the purpose of determining compliance with the old inorganic MCLs of Section 611.300 are required as follows:

   1) Analyses for all CWSs utilizing surface water sources must be repeated at yearly intervals.

   2) Analyses for all CWSs utilizing only groundwater sources must be repeated at three-year intervals.

   3) This subsection (a)(3) corresponds with 40 CFR 141.23(1)(3), which requires monitoring for the repealed old MCL for nitrate at a frequency specified by the state. The Board has followed the USEPA lead and repealed that old MCL. This statement maintains structural consistency with USEPA rules.

4) This subsection (a)(4) corresponds with 40 CFR 141.23(1)(4), which authorizes the state to determine compliance and initiate enforcement action. This statement maintains structural consistency with USEPA rules.

b) If the result of an analysis made under subsection (a) indicates that the level of any contaminant listed in Section 611.300 exceeds the old MCL, the supplier must report to the Agency within seven days and initiate three additional analyses at the same sampling point within one month.

c) When the average of four analyses made under subsection (b), rounded to the same number of significant figures as the old MCL for the substance in question, exceeds the old MCL, the supplier must notify the Agency and give notice to the public under Subpart V. Monitoring after public notification must be at a frequency designated by the Agency by a SEP and must continue until the old MCL has not been exceeded in two successive samples or until a different monitoring schedule becomes effective as a condition to a variance, an adjusted standard, a site specific rule, an enforcement action, or another SEP.

d) This subsection (d) corresponds with 40 CFR 141.23(o), which pertains to monitoring for the repealed old MCL for nitrate. This statement maintains structural consistency with USEPA rules.

e) This subsection (e) corresponds with 40 CFR 141.23(p), which pertains to the use of existing data up until a date long since expired. This statement maintains structural consistency with USEPA rules.

f) Analyses conducted to determine compliance with the old MCLs of Section 611.300 must be made in accordance with the following methods, incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480. Criteria for analyzing iron, manganese, and zinc samples with digestion or directly without digestion, and other analytical test procedures are contained in USEPA Technical Notes (94), incorporated by reference in Section 611.102.

1) Fluoride.~~:~~ The methods specified in Section 611.611(c) must apply for the purposes of this Section.

2) Iron~~.~~

~~A) Standard Methods.~~

A~~i~~) Atomic Absorption, Direct Aspiration Technique. SM ~~Method~~ 3111 B (89), SM 3111 B (93), or SM 3111 B (99).~~, 18th, 19th, 21st, or 22nd ed.;~~

B~~ii~~) Atomic Absorption, Graphite Furnace Technique. SM ~~Method~~ 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10)~~, 18th, 19th, 21st, or 22nd ed.; or~~

C~~iii~~) Atomic Absorption, Inductively Coupled Plasma Technique. SM ~~Method~~ 3120 B (89), SM 3120 B (93), or SM 3120 B (99)~~, 18th, 19th, 20th, 21st, or 22nd ed~~.

~~B) Standard Methods Online, Method 3113 B-04.~~

~~C) USEPA Environmental Metals Methods.~~

D~~i~~) Inductively Coupled Plasma Arc Furnace Technique. USEPA ~~Method~~ 200.7 (94) ~~(rev. 4.4); or~~

E~~ii~~) Atomic Absorption, Platform Furnace Technique. USEPA ~~Method~~ 200.9 (94) ~~(rev. 2.2)~~.

F~~D~~) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added USEPA NERL Method 200.5 as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 21st ed.; Methods 3111 B, 3113 B, and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 D, 3113 B, and 3120 B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

3) Manganese~~.~~

~~A) Standard Methods.~~

A~~i~~) Atomic Absorption, Direct Aspiration Technique. SM ~~Method~~ 3111 B (89), SM 3111 B (93), or SM 3111 B (99).~~, 18th, 19th, 21st, or 22nd ed.;~~

B~~ii~~) Atomic Absorption, Graphite Furnace Technique. SM ~~Method~~ 3113 B (89), SM 3113 B (93), SM 3113 B (99), SM 3113 B (04), or SM 3113 B (10).~~, 18th, 19th, 21st, or 22nd ed.; or~~

C~~iii~~) Atomic Absorption, Inductively Coupled Plasma Technique. SM

~~Method~~ 3120 B (89), SM 3120 B (93), or SM 3120 B (99)~~, 18th, 19th, 20th, 21st, or 22nd ed~~.

~~B) Standard Methods Online, Method 3113 B-04.~~

~~C) USEPA Environmental Metals Methods.~~

D~~i~~) Inductively Coupled Plasma Arc Furnace Technique. USEPA ~~Method~~ 200.7 (94). ~~(rev. 4.4); or~~

E~~ii~~) Inductively Coupled Plasma-Mass Spectrometry. USEPA ~~Method~~ 200.8 (94). ~~(rev. 5.3); or~~

F~~iii~~) Atomic Absorption, Platform Furnace Technique. USEPA ~~Method~~ 200.9 (94) ~~(rev. 2.2)~~.

G~~D~~) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed.; Methods 3111 B, 3113 B, and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods Online, Method 3113 B-04 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 22nd ed., Methods 3111 D, 3113 B, and 3120 B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Method 3113 B-10 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 3113 B is the same version as Standard Methods Online, Method 3113 B-10, the Board has not listed the Standard Methods Online versions separately.~~

4) Zinc~~.~~

~~A) Standard Methods.~~

A~~i~~) Atomic Absorption, Direct Aspiration Technique. SM ~~Method~~ 3111 B (89), SM 3111 B (93), or SM 3111 B (99).~~, 18th, 19th, 21st, or 22nd ed.;~~

B~~ii~~) Atomic Absorption, Inductively Coupled Plasma Technique. SM ~~Method~~ 3120 B (89), SM 3120 B (93), or SM 3120 B (99)~~, 18th, 19th, 20th, 21st, or 22nd ed~~.

~~B) USEPA Environmental Metals Methods.~~

C~~i~~) Inductively Coupled Plasma Arc Furnace Technique. USEPA

~~Method~~ 200.7 (94). ~~(rev. 4.4); or~~

D~~ii~~) Atomic Absorption, Platform Furnace Technique. USEPA ~~Method~~ 200.8 (94) ~~(rev. 5.3)~~.

E~~C~~) Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry ~~viewed inductively coupled plasma-atomic emission spectrometry~~ (AVICP-AES).~~:~~ USEPA ~~NERL Method~~ 200.5 (03).

~~BOARD NOTE: USEPA added Standard Methods, 21st ed.; Methods 3111 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Methods 3111 B and 3120 B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

BOARD NOTE: The provisions of subsections (a) through (e) derive from 40 CFR 141.23(l) through (p) ~~(2016)~~. Subsections (f)(2) through (f)(4) relate exclusively to additional State requirements. The Board retained subsection (f) to set forth methods for the inorganic contaminants for which there is a State-only MCL. The methods specified are those set forth in 40 CFR 143.4(b) and appendix A to subpart C of 40 CFR 141 ~~(2016)~~, for secondary MCLs. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 3111 B-99 appears in the 21st, 22nd, and 23rd editions as Method 3111 B. In this Section, this appears as SM 3111 B (99).

Standard Methods Online, Method 3113 B-99 appears in the 21st edition as Method 3113 B. In this Section, this appears as SM 3113 B (99).

Standard Methods Online, Method 3113 B-10 appears in the 22nd and 23rd editions as Method 3113 B. In this Section, this appears as SM 3113 B (10).

Standard Methods Online, Method 3120 B-99 appears in the 21st edition as Method 3120 B. In this Section, this appears as SM 3120 B (99).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART O: ORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.645 Analytical Methods for Organic Chemical Contaminants

Analysis for the Section 611.311(a) VOCs under Section 611.646, the Section 611.311(c) SOCs under Section 611.648, the Section 611.310 old MCLs under Section 611.641, and for the Section 611.312 MCL for TTHMs under Section 611.381 must be conducted using the methods listed in this Section. All methods are incorporated by reference in Section 611.102. Other required analytical test procedures germane to the conduct of these analyses are contained in the

USEPA Technical Notes, incorporated by reference in Section 611.102.

a) Volatile Organic Chemical Contaminants (VOCs)~~.~~

1) Benzene

A) Purge and Trap Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

2) Carbon tetrachloride

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

C) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

3) Chlorobenzene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

4) 1,2-Dichlorobenzene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

5) 1,4-Dichlorobenzene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

6) 1,2-Dichloroethane

A) Purge and Trap Capillary Column Gas Chromatography. USEPA

502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

7) 1,1-Dichloroethylene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

8) cis-Dichloroethylene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

9) trans-Dichloroethylene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

10) Dichloromethane

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

11) 1,2-Dichloropropane

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

12) Ethylbenzene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

13) Styrene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95)

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

14) Tetrachloroethylene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

C) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

15) Toluene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

16) 1,2,4-Trichlorobenzene

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

17) 1,1,1-Trichloroethane

A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

C) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

18) 1,1,2-Trichloroethane

- A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

- B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

- C) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

19) Trichloroethylene

- A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

- B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

- C) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

20) Vinyl chloride

- A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

- B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

21) Xylenes (total)

- A) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

- B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), 524.3 (09), or 524.4 (13).

~~Contaminant~~	~~Analytical Methods~~
~~Benzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~

~~Carbon tetrachloride~~	~~USEPA Organic Methods, Method 502.2 (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4 and 551.1 (rev. 1.0)~~
~~Chlorobenzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,2-Dichlorobenzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,4-Dichlorobenzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,2-Dichloroethane~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,1-Dichloroethylene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~cis-Dichloroethylene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~trans-Dichloroethylene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~Dichloromethane~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,2-Dichloropropane~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~

~~Ethylbenzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~Styrene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~Tetrachloroethylene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4, and 551.1 (rev. 1.0)~~
~~Toluene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,2,4-Trichlorobenzene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~
~~1,1,1-Trichloroethane~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4, and 551.1 (rev. 1.0)~~
~~1,1,2-Trichloroethane~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4, and 551.1 (rev. 1.0)~~
~~Trichloroethylene~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1);~~ ~~USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4, and 551.1 (rev. 1.0)~~
~~Vinyl chloride~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~

~~Xylenes (total)~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and (rev. 4.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 524.4~~

~~BOARD NOTE: USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added USEPA OGWDW Method 524.4 as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558).~~

b) Synthetic Organic Chemical Contaminants (SOCs)~~.~~

1) 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCDD or Dioxin). Isotope Dilution High Resolution Gas Chromatography-High Resolution Mass Spectrometry. USEPA 1613 (94).

2) 2,4-D

A) Gas Chromatography with Electron Capture Detector. ASTM D5317-93, ASTM D5317-98(2003), SM 6640 B (01), or SM 6640 B (06).

B) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.2 (95).

D) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. USEPA 515.4 (00).

E) High Performance Liquid Chromatography with Photodiode Array Ultraviolet Detector. USEPA 555 (92).

3) 2,4,5-TP (Silvex)

A) Gas Chromatography with Electron Capture Detector. ASTM D5317-93, ASTM D5317-98(2003), SM 6640 B (01), or SM 6640 B (06).

B) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.2 (95).

D) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. USEPA 515.4

(00).

E) High Performance Liquid Chromatography with Photodiode Array Ultraviolet Detector. USEPA 555 (92).

4) Alachlor

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Nitrogen-Phosphorus Detector. USEPA 507 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

5) Atrazine

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Nitrogen-Phosphorus Detector. USEPA 507 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 523 (11).

E) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

F) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

G) Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry. USEPA 536 (07).

H) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

I) Immunoassay. Syngenta AG-625[2].

6) Benzo(a)pyrene

A) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

B) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

C) Liquid Liquid Extraction and HPLC with Coupled Ultraviolet and Fluorescence Detection. USEPA 550 (90) or USEPA 550.1 (90).

7) Carbofuran. Direct Aqueous Injection HPLC with Post-Column Derivatization. SM 6610 (92), 6610 (96), 6610 B (99), SM 6610 B (04), USEPA 531.1 (95), or USEPA 531.2 (01).

8) Chlordane

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

9) Dalapon

A) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

B) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. SM 6640 B (01), SM 6640 B (06), or USEPA 515.4 (00).

C) Solid Phase Extractor (Acidic Methanol), Gas Chromatography, Electron Capture Detector. USEPA 552.1 (92).

D) Liquid-Liquid Extraction (Acidic Methanol), Gas Chromatography, Electron Capture Detector. USEPA 552.2 (95) or USEPA 552.3 (03).

E) Ion Chromatography, Electrospray Ionization, Tandem Mass Spectrometry. USEPA 557 (09).

10) Dibromochloropropane (DBCP)

A) Microextraction and Gas Chromatography. USEPA 504.1 (95).

B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.3 (09).

C) Liquid-Liquid Extraction, Gas Chromatography, Electron Capture Detector. USEPA 551.1 (95).

11) Di(2-ethylhexyl)adipate

A) Liquid-Liquid or Liquid-Solid Extraction and Gas Chromatography with Photoionization Detection. USEPA 506 (95).

B) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

C) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

12) Di(2-ethylhexyl)phthalate

A) Liquid-Liquid or Liquid-Solid Extraction and Gas Chromatography with Photoionization Detection. USEPA 506 (95).

B) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

C) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

13) Dinoseb

A) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

B) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.2 (95).

C) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. SM 6640 B (01), SM 6640 B (06), or USEPA 515.4 (00).

D) High Performance Liquid Chromatography with Photodiode Array Ultraviolet Detector. USEPA 555 (92).

14) Diquat. Liquid-Solid Extraction and HPLC with Ultraviolet Detection. USEPA 549.2 (97).

15) Endothall. Ion-Exchange Extraction, Acidic Methanol Methylation and Gas Chromatography/Mass Spectrometry. USEPA 548.1 (92).

16) Endrin

   A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

   B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

   C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

   D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

   E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

   F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

17) Ethylene Dibromide (EDB)

   A) Microextraction and Gas Chromatography. USEPA 504.1 (95).

   B) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.3 (09).

   C) Liquid-Liquid Extraction, Gas Chromatography, Electron Capture Detector. USEPA 551.1 (95).

18) Glyphosate

   A) Direct Aqueous Injection HPLC, Post-Column Derivatization, and Fluorescence Detection. USEPA 547 (90).

   B) Anion- or Cation-Exchange HPLC and Post-Column Derivatization with Ultraviolet Fluorescence Detector. SM 6651 B (91), SM 6651 B (96), SM 6651 B (00), or SM 6651 B (05).

19) Heptachlor

   A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

   B) Gas Chromatography with Electron Capture Detector. USEPA

508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

20) Heptachlor Epoxide

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

21) Hexachlorobenzene

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

22) Hexachlorocyclopentadiene

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

23) Lindane

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

24) Methoxychlor

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron

Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

F) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

25) Oxamyl. Direct Aqueous Injection HPLC with Post-Column Derivatization. SM 6610 (92), 6610 (96), 6610 B (99), SM 6610 B (04), USEPA 531.1 (95), or USEPA 531.2 (01).

26) PCBs (measured for compliance purposes as decachlorobiphenyl). Screening by Perchlorination and Gas Chromatography. USEPA 508A (89).

27) PCBs (qualitatively identified as alachlors)

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

28) Pentachlorophenol

A) Gas Chromatography with Electron Capture Detector. ASTM D5317-93, ASTM D5317-98(2003), SM 6640 B (01), or SM 6640 B (06).

B) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.2 (95).

D) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. USEPA 515.4 (00).

E) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

F) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

G) High Performance Liquid Chromatography with Photodiode Array Ultraviolet Detector. USEPA 555 (92).

29) Picloram

A) Gas Chromatography with Electron Capture Detector. ASTM D5317-93, ASTM D5317-98(2003), SM 6640 B (01), or SM 6640 B (06).

B) Liquid-Liquid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.1 (89) or USEPA 515.3 (96).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 515.2 (95).

D) Liquid-Liquid Microextraction, Derivatization, and Fast Gas Chromatography with Electron Capture Detector. USEPA 515.4 (00).

E) High Performance Liquid Chromatography with Photodiode Array Ultraviolet Detector. USEPA 555 (92).

30) Simazine

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 507 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 523 (11).

E) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

F) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

G) Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry. USEPA 536 (07).

H) Liquid-Liquid Extraction and Gas Chromatography. USEPA

551.1 (95).

31) Toxaphene

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

E) Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry. USEPA 525.3 (12).

~~Contaminant~~	~~Analytical Methods~~
~~2,3,7,8-Tetrachlorodibenzo-dioxin (2,3,7,8-TCDD or dioxin)~~	~~Dioxin and Furan Method 1613 (rev. B)~~
~~2,4-D~~	~~USEPA Organic Methods, Methods 515.2 (rev. 1.1), 555 (rev. 1.0), and 515.1 (rev. 4.0);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0);~~ ~~USEPA OGWDW Methods, Method 515.4 (rev. 1.0);~~ ~~ASTM Method D5317-93 or D5317-98(2003); and~~ ~~Standard Methods, 21st or 22nd ed., Method 6640 B~~
~~2,4,5-TP (Silvex)~~	~~USEPA Organic Methods, Methods 515.2 (rev. 1.1), 555 (rev. 1.0), and 515.1 (rev. 4.0);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0);~~ ~~USEPA OGWDW Methods, Method 515.4 (rev. 1.0);~~ ~~ASTM Method D5317-93 or D5317-98(2003); and~~ ~~Standard Methods, 21st or 22nd ed., Method 6640 B~~

~~Alachlor~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1)[1], 507 (rev. 2.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (ver. 1.0)~~
~~Atrazine~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 507 (rev. 2.1), 508.1 (rev. 2.0), 523 (rev. 1.0), 525.2 (rev. 2.0), 536 (rev. 1.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (ver. 1.0);~~ ~~Syngenta AG-625[2]~~
~~Benzo(a)pyrene~~	~~NERL Method 525.3 (ver. 1.0)~~ ~~USEPA Organic Methods, Methods 525.2 (rev. 2.0), 525.3, 550, or and 550.1;~~ ~~NERL Method 525.3 (ver. 1.0)~~
~~Carbofuran~~	~~USEPA Organic Methods, Methods 531.1 (rev. 3.1);~~ ~~USEPA OGWDW Methods, Method 531.2 (rev. 1.0);~~ ~~SM Standard Methods, 18th ed. Supplement, 19th ed., or 20th ed., Method 6610;~~ ~~Standard Methods, 21st, or 22nd ed., Method 6610 B~~
~~Chlordane~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.1), and 525.2 (rev. 2.0);~~ ~~NERL Method 525.3 (ver. 1.0)~~
~~Dalapon~~	~~USEPA Organic Methods, Methods 515.1 (rev. 4.0), 552.1 (rev. 1.0), and 552.2 (rev. 1.0);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3, (rev. 1.0);~~ ~~USEPA OGWDW Methods, Methods 515.4 (rev. 1.0), 552.3 (rev. 1.0), and 557;~~ ~~Standard Methods, 21st or 22nd ed., Method 6640 B~~

~~Dibromochloropropane (DBCP)~~	~~USEPA Organic Methods, Method 504.1 (rev. 1.1), USEPA OGWDW Methods, Methods 524.3 (rev. 1.0) and 551.1 (rev. 1.0)~~
~~Di(2-ethylhexyl)adipate~~	~~USEPA Organic Methods, Methods 506 (rev. 1.1), 525.2 (rev. 2.0), and 525.3 (ver. 1.0)~~
~~Di(2-ethylhexyl)phthalate~~	~~USEPA Organic Methods, Methods 506 (rev. 1.1), 525.2 (rev. 2.0), and 525.3 (ver. 1.0)~~
~~Dinoseb~~	~~USEPA Organic Methods, Methods 515.1 (rev. 4.0) and 515.2 (rev. 1.1);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0~~); USEPA OGWDW Methods, Methods 515.4 (rev. 1.0) and 555 (rev. 1.0); Stan~~dard Methods, 21st or 22nd ed., Method 6640 B~~
~~Diquat~~	~~USEPA NERL Method 549.2 (rev. 1.0)~~
~~Endothall~~	~~USEPA Organic Methods, Method 548.1 (rev. 1.0)~~
~~Endrin~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Ethylene Dibromide (EDB)~~	~~USEPA Organic Methods, Method 504.1 (rev. 1.1);~~ ~~USEPA OGWDW Methods, Method 524.3 (rev. 1.0) and 551.1 (rev. 1.0)~~
~~Glyphosate~~	~~USEPA Organic Methods, Method 547;~~ ~~Standard Methods, 18th ed., 19th ed., 20th, 21st, or 22nd ed., Method 6651 B~~
~~Heptachlor~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~

~~Heptachlor Epoxide~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Hexachlorobenzene~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Hexachlorocyclopentadiene~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Lindane~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Methoxychlor~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Oxamyl~~	~~USEPA Organic Methods, Methods 531.1 (rev. 3.1);~~ ~~USEPA OGWDW Methods, Method 531.2 (rev. 1.0);~~ ~~SM Standard Methods, 18th ed. Supplement, 19th ed., or 20th ed., Method 6610;~~ ~~Standard Methods, 21st, or 22nd ed., Method 6610 B~~
~~PCBs (measured for compliance purposes as decachlorobiphenyl)~~	~~USEPA Organic Methods, Method 508A (rev. 1.0)~~
~~PCBs (qualitatively identified as alachlors)~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), and 525.2 (rev. 2.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~

~~Pentachlorophenol~~	~~USEPA Organic Methods, Methods 515.1 (rev. 4.0), 515.2 (rev. 1.1), 525.2 (rev. 2.0), and 555 (rev. 1.0);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0);~~ ~~USEPA OGWDW Methods, Method 515.4 (rev. 1.0);~~ ~~ASTM Method D5317-93 or D5317-98(2003);~~ ~~Standard Methods, 21st or 22nd ed., Method 6640 B;~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Picloram~~	~~USEPA Organic Methods, Methods 515.1 (rev. 4.0), 515.2 (rev. 1.1), and 555 (rev. 1.0);~~ ~~USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0);~~ ~~USEPA OGWDW Methods, Method 515.4 (rev. 1.0);~~ ~~ASTM Method D5317-93 or D5317-98(2003);~~ ~~Standard Methods, 21st or 22nd ed., Method 6640 B~~
~~Simazine~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 523 (ver. 1.0), 525.2 (rev. 2.0), 536 (ver. 1.0), and 551.1 (rev. 1.0);~~ ~~NERL Method 525.3 (rev. 1.0)~~
~~Toxaphene~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), and 525.2 (rev. 2.0), ;~~ ~~NERL Method 525.3 (ver. 1.0)~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 6610 B and Standard Methods Online, Method 6610 B-04 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA approved Standard Methods, 21st ed., Method 6640 B and Standard Methods Online, Method 6640 B-01 and USEPA OGWDW Methods, Method 557 as approved alternative methods on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 21st ed., Method 6640 B as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, Online, Method 6640 B-01 as an approved alternative~~

~~method on June 24, 2011 (at 76 Fed. Reg. 37014). Since the version of Method 6640 B that appears in Standard Methods Online is the same as that which appears in Standard Methods, 21st ed., the Board has cited only to Standard Methods, 21st ed. USEPA added Standard Methods, 21st ed., Method 6651 B as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods Online, Method 6651 B-00 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). Since the version of Method 6651 B that appears in Standard Methods Online is the same as that which appears in Standard Methods, 21st ed., the Board hascited only to Standard Methods, 21st ed. USEPA approved USEPA OGWDW Methods, Method 523 (ver. 1.0) and Method 536 (ver. 1.0) and USEPA NERL Methods, Method 525.3 as approved alternative methods on June 8, 2012 (at 77 Fed. Reg. 38523). USEPA added Standard Methods, 22nd ed., Method 6610 B, Method 6640 B, and Method 6651 B and Standard Methods Online, Method 6610 B-04 and Method 6640 B-01 as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). Because Standard Methods, 22nd ed., Methods 6610 B and 6640 B-01 are the same versions as Standard Methods Online 6610 B-04 and 6640 B-01, the Board has not listed the Standard Methods Online versions separately. USEPA added Standard Methods Online, Method 6640 B-06 and Method 6651B-05 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Methods 6640 B and 6651 B are the same versions as Standard Methods Online, Methods 6640 B-06 and 6651 B-05, the Board has not listed the Standard Methods Online versions separately.~~

c) Total Trihalomethanes (TTHMs)~~.~~

1) Purge and Trap Capillary Column Gas Chromatography. USEPA 502.2 (95).

2) Purge and Trap Gas Chromatography-Mass Spectrometry. USEPA 524.2 (95), USEPA 524.3 (09), or USEPA 524.4 (13).

3) Liquid-Liquid Extraction and Gas Chromatography. USEPA 551.1 (95).

~~Contaminant~~	~~Analytical Methods~~
~~Total Trihalomethanes (TTHMs)~~	~~USEPA Organic Methods, Method 502.2, (rev. 2.1) and 524.2 (rev. 4.1); USEPA OGWDW Methods, Methods 524.3 (rev. 1.0), 524.4, and 551.1 (rev. 1.0)~~

~~BOARD NOTE: USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added USEPA OGWDW Method 524.4 as an approved alternative method on May 31, 2013 (at 78 Fed. Reg. 32558).~~

d) State-Only MCLs (for which a method is not listed in subsections (a) through (c))~~.~~

1) Aldrin

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

2) DDT

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

3) Dieldrin

A) Microextraction and Gas Chromatography. USEPA 505 (95)[1].

B) Gas Chromatography with Electron Capture Detector. USEPA 508 (95).

C) Liquid-Solid Extraction Gas Chromatography with Electron Capture Detector. USEPA 508.1 (95).

D) Gas Chromatography-Mass Spectrometry. USEPA 525.2 (95).

~~Contaminant~~	~~Analytical Methods~~
~~Aldrin~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), and 525.2 (rev. 2.0)~~
~~DDT~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1) and 508 (rev. 3.1)~~
~~Dieldrin~~	~~USEPA Organic Methods, Methods 505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), and 525.2 (rev. 2.0)~~

e) The following endnotes ~~footnotes~~ are appended to method entries in subsections (a) and (b):

[1] denotes that, for the particular contaminant, a nitrogen-phosphorus detector should be substituted for the electron capture detector in USEPA ~~method~~ 505 (95) (or another approved method should be used) to determine alachlor, atrazine, and simazine if lower detection limits are required.

[2] denotes that Syngenta ~~Method~~ AG-625 (01) may not be used for the analysis of atrazine in any system where chlorine dioxide is used for drinking water treatment. In samples from all other systems, any result for atrazine generated by Syngenta ~~Method~~ AG-625 (01) that is greater than one-half the maximum contaminant level (MCL) (in other words, greater than 0.0015 mg/ℓ or 1.5 μg/ℓ) must be confirmed using another approved method for this contaminant and should use additional volume of the original sample collected for compliance monitoring. In instances where a result from Syngenta ~~Method~~ AG-625 (01) triggers such confirmatory testing, the confirmatory result is to be used to determine compliance.

BOARD NOTE: Derived from 40 CFR 141.24(e) and appendix A to subpart C of 40 CFR 141 ~~(2016)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 6610 B-04 appears in the 22nd and 23rd editions as Method 6610 B. In this Section, this appears as SM 6610 B (04).

Standard Methods Online, Method 6640 B-01 appears in the 21st edition as Method 6640 B. In this Section, this appears as SM 6640 B (01).

Standard Methods Online, Method 6640 B-06 appears in the 22nd and 23rd editions as Method 6640 B. In this Section, this appears as SM 6640 B (06).

Standard Methods Online, Method 6651 B-00 appears in the 21st edition as Method 6651 B. In this Section, this appears as SM 6651 B (00).

Standard Methods Online, Method 6651 B-05 appears in the 22nd and 23rd editions as Method 6651 B. In this Section, this appears as SM 6651 B (05).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.646 Phase I, Phase II, and Phase V Volatile Organic Contaminants

Monitoring of the Phase I, Phase II, and Phase V VOCs for the purpose of determining compliance with the MCL must be conducted as follows:

a) Definitions. As used in this Section the following have the given meanings:

"Detect" and "detection" mean that the contaminant of interest is present at a level greater than or equal to the "detection limit".

"Detection limit" means 0.0005 mg/ℓ.
BOARD NOTE: Derived from 40 CFR 141.24(f)(7), (f)(11), (f)(14)(i), and (f)(20) ~~(2016)~~. This is a "trigger level" for Phase I, Phase II, and Phase V VOCs inasmuch as it prompts further action. The use of the term "detect" in this Section is not intended to include any analytical capability of quantifying lower levels of any contaminant, or the "method detection limit". Note, however, that certain language at the end of federal paragraph (f)(20) is capable of meaning that the "method detection limit" is used to derive the "detection limit". The Board has chosen to disregard that language at the end of paragraph (f)(20) in favor of the more direct language of paragraphs (f)(7) and (f)(11).

"Method detection limit", as used in subsections (q) and (t) means the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.
BOARD NOTE: Derived from appendix B to 40 CFR 136 ~~(2016)~~. The method detection limit is determined by the procedure set forth in appendix B to 40 CFR 136, incorporated by reference in Section 611.102(c). See subsection (t).

b) Required Sampling ~~sampling~~. Each supplier must take a minimum of one sample at each sampling point at the times required in subsection (u).

c) Sampling Points ~~points.~~

1) Sampling Points ~~points~~ for a GWS. Unless otherwise provided by a SEP granted by the Agency, a GWS supplier must take at least one sample from each of the following points: each entry point that is representative of each well after treatment.

2) Sampling Points ~~points~~ for an SWS or Mixed System Supplier ~~mixed system supplier~~. Unless otherwise provided by a SEP granted by the Agency, an SWS or mixed system supplier must sample from each of the following points:

A) Each entry point after treatment; or

B) Points in the distribution system that are representative of each source.

3) The supplier must take each sample at the same sampling point unless the Agency has granted a SEP that designates another location as more

representative of each source, treatment plant, or within the distribution system.

4) If a system draws water from more than one source, and the sources are combined before distribution, the supplier must sample at an entry point during periods of normal operating conditions when water is representative of all sources being used.

BOARD NOTE: Subsections (b) and (c) derived from 40 CFR 141.24(f)(1) through (f)(3) ~~(2016)~~.

d) Each CWS and NTNCWS supplier must take four consecutive quarterly samples for each of the Phase I VOCs, excluding vinyl chloride, and Phase II VOCs during each compliance period, beginning in the compliance period starting in the initial compliance period.

e) This subsection (e) corresponds with 40 CFR 141.24(f)(5), which no longer has operative effect. This statement maintains structural consistency with the federal regulations.

f) GWS Reduction ~~reduction~~ to Triennial Monitoring Frequency ~~triennial monitoring frequency~~. After a minimum of three years of annual sampling, GWS suppliers that have not previously detected any of the Phase I VOCs, including vinyl chloride; Phase II VOCs; or Phase V VOCs must take one sample during each three-year compliance period.

g) A CWS or NTNCWS supplier that has completed the initial round of monitoring required by subsection (d) and which did not detect any of the Phase I VOCs, including vinyl chloride; Phase II VOCs; and Phase V VOCs may apply to the Agency for a SEP that releases it from the requirements of subsection ~~(e) or~~ (f). A supplier that serves fewer than 3300 service connections may apply to the Agency for a SEP that releases it from the requirements of subsection (d) as to 1,2,4-trichlorobenzene.

BOARD NOTE: Derived from 40 CFR 141.24(f)(7) and (f)(10) ~~(2016)~~, and the discussion at 57 Fed. Reg. 31825 (July 17, 1992). Provisions concerning the term of the waiver appear in subsections (i) and (j). The definition of "detect", parenthetically added to the federal counterpart paragraph, is in subsection (a).

h) Vulnerability Assessment ~~assessment~~. The Agency must consider the factors of Section 611.110(a) in granting a SEP from the requirements of subsection (d), (e), or (f) under ~~sought pursuant to~~ subsection (g).

i) A SEP issued to a GWS under subsection (g) is for a maximum of six years, except that a SEP as to the subsection (d) monitoring for 1,2,4-trichlorobenzene must apply only to the initial round of monitoring. As a condition of a SEP, except as to a SEP from the initial round of subsection (d) monitoring for 1,2,4-trichlorobenzene, the supplier shall, within 30 months after the beginning of the period for which the waiver was issued, reconfirm its vulnerability assessment required by subsection (h) and submitted under ~~pursuant to~~ subsection (g), by taking one sample at each sampling point and reapplying for a SEP under subsection (g). Based on this application, the Agency must do either of the following:

1) If it determines that the PWS meets the standard of Section 611.610(e), issue a SEP that reconfirms the prior SEP for the remaining three-year compliance period of the six-year maximum term; or

2) Issue a new SEP requiring the supplier to sample annually.

BOARD NOTE: Subsection (i) does not apply to an SWS or mixed system supplier.

j) Special Considerations ~~considerations~~ for a SEP for an SWS or Mixed-System Supplier ~~mixed-system supplier.~~

1) The Agency must determine that an SWS is not vulnerable before issuing a SEP to an SWS supplier. A SEP issued to an SWS or mixed system supplier under ~~pursuant to~~ subsection (g) is for a maximum of one compliance period; and

2) The Agency may require, as a condition to a SEP issued to an SWS or mixed supplier, that the supplier take such samples for Phase I, Phase II, and Phase V VOCs at such a frequency as the Agency determines are necessary, based on the vulnerability assessment.

BOARD NOTE: There is a great degree of similarity between 40 CFR 141.24(f)(7) ~~(2016)~~, the provision applicable to GWSs, and 40 CFR 141.24(f)(10) ~~(2016)~~, the provision for SWSs. The Board has consolidated the common requirements of both paragraphs into subsection (g). Subsection (j) represents the elements unique to an SWSs or mixed system, and subsection (i) relates to a GWS supplier. Although 40 CFR 141.24(f)(7) and (f)(10) are silent as to a mixed system supplier, the Board has included a mixed system supplier with an SWS supplier because this best follows the federal scheme for all other contaminants.

k) If one of the Phase I VOCs, excluding vinyl chloride; a Phase II VOC; or a Phase V VOC is detected in any sample, then the following must occur:

1) The supplier must monitor quarterly for that contaminant at each sampling point that resulted in a detection.

2) Annual Monitoring ~~monitoring.~~

A) The Agency must grant a SEP that allows a supplier to reduce the monitoring frequency to annual at a sampling point if it determines that the sampling point is reliably and consistently below the MCL.

B) A request for a SEP must include the following minimal information:

i) For a GWS, two quarterly samples.

ii) For an SWS or mixed system supplier, four quarterly samples.

C) In issuing a SEP, the Agency must specify the level of the contaminant upon which the “reliably and consistently” determination was based. Any SEP that allows less frequent monitoring based on an Agency “reliably and consistently” determination must include a condition requiring the supplier to resume quarterly monitoring under subsection (k)(1) if it violates the MCL specified by Section 611.311.

3) Suppliers that monitor annually must monitor during the quarters that previously yielded the highest analytical result.

4) Suppliers that do not detect a contaminant at a sampling point in three consecutive annual samples may apply to the Agency for a SEP that allows it to discontinue monitoring for that contaminant at that point, as specified in subsection (g).

5) A GWS supplier that has detected one or more of the two-carbon contaminants listed in subsection (k)(5)(A) must monitor quarterly for vinyl chloride as described in subsection (k)(5)(B), subject to the limitation of subsection (k)(5)(C).

A) “Two-carbon contaminants” (Phase I or II VOC) are the following:

1,2-Dichloroethane (Phase I)
1,1-Dichloroethylene (Phase I)
cis-1,2-Dichloroethylene (Phase II)
trans-1,2-Dichloroethylene (Phase II)
Tetrachloroethylene (Phase II)
1,1,1-Trichloroethylene (Phase I)
Trichloroethylene (Phase I)

B) The supplier must sample quarterly for vinyl chloride at each sampling point at which it detected one or more of the two-carbon contaminants listed in subsection (k)(5)(A).

C) The Agency must grant a SEP that allows the supplier to reduce the monitoring frequency for vinyl chloride at any sampling point to once in each three-year compliance period if it determines that the supplier has not detected vinyl chloride in the first sample required by subsection (k)(5)(B).

l) Quarterly Monitoring Following ~~monitoring following~~ MCL Violations ~~violations.~~

1) Suppliers that violate an MCL for one of the Phase I VOCs, including vinyl chloride; Phase II VOCs; or Phase V VOCs, as determined by subsection (o), must monitor quarterly for that contaminant, at the sampling point where the violation occurred, beginning the next quarter after the violation.

2) Annual Monitoring ~~monitoring.~~

A) The Agency must grant a SEP that allows a supplier to reduce the monitoring frequency to annually if it determines that the sampling point is reliably and consistently below the MCL.

B) A request for a SEP must include the following minimal information: four quarterly samples.

C) In issuing a SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. Any SEP that allows less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring under subsection (l)(1) if it violates the MCL specified by Section 611.311.

D) The supplier must monitor during the quarters that previously yielded the highest analytical result.

m) Confirmation Samples ~~samples~~. The Agency may issue a SEP to require a supplier to use a confirmation sample for results that it finds dubious for whatever reason. The Agency must state its reasons for issuing the SEP if the SEP is Agency-initiated.

1) If a supplier detects any of the Phase I, Phase II, or Phase V VOCs in a sample, the supplier must take a confirmation sample as soon as possible, but no later than 14 days after the supplier receives notice of the detection.

2) Averaging is as specified in subsection (o).

3) The Agency must delete the original or confirmation sample if it determines that a sampling error occurred, in which case the confirmation sample will replace the original or confirmation sample.

n) This subsection (n) corresponds with 40 CFR 141.24(f)(14), an optional USEPA provision relating to compositing of samples that USEPA does not require for state programs. This statement maintains structural consistency with USEPA rules.

o) Compliance with the MCLs for the Phase I, Phase II, and Phase V VOCs must be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

1) For a supplier that monitors more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

2) A supplier that monitors annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

3) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the supplier is out of compliance with the MCL immediately.

4) If a supplier fails to collect the required number of samples, compliance will be based on the total number of samples collected.

5) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

p) This subsection (p) corresponds with 40 CFR 141.24(f)(16), which USEPA removed and reserved. This statement maintains structural consistency with the federal regulations.

q) Analysis under this Section must only be conducted by a laboratory in one of the categories listed in Section 611.490(a) that has been certified according to the following conditions:

1) To receive certification to conduct analyses for the Phase I VOCs, excluding vinyl chloride; Phase II VOCs; and Phase V VOCs, the laboratory must do the following:

A) It must analyze performance evaluation (PE) samples that include these substances provided by the Agency under 35 Ill. Adm. Code 186.170;

B) It must achieve the quantitative acceptance limits under subsections (q)(1)(C) and (q)(1)(D) for at least 80 percent of the regulated organic contaminants in the PE sample;

C) It must achieve quantitative results on the analyses performed under subsection (q)(1)(A) that are within ± 20 percent of the actual amount of the substances in the PE sample when the actual amount is greater than or equal to 0.010 mg/ℓ;

D) It must achieve quantitative results on the analyses performed under subsection (q)(1)(A) that are within ± 40 percent of the actual amount of the substances in the PE sample when the actual amount is less than 0.010 mg/ℓ; and

E) It must achieve a method detection limit of 0.0005 mg/ℓ, according to the procedures in appendix B to 40 CFR 136, incorporated by reference in Section 611.102.

2) To receive certification to conduct analyses for vinyl chloride the laboratory must do the following:

A) It must analyze PE samples provided by the Agency under 35 Ill. Adm. Code 186.170;

B) It must achieve quantitative results on the analyses performed under subsection (q)(2)(A) that are within ± 40 percent of the actual amount of vinyl chloride in the PE sample;

C) It must achieve a method detection limit of 0.0005 mg/ℓ, according to the procedures in appendix B to 40 CFR 136, incorporated by reference in Section 611.102; and

D) It must obtain certification under subsection (q)(1) for Phase I VOCs, excluding vinyl chloride; Phase II VOCs; and Phase V VOCs.

r) This subsection (r) corresponds with 40 CFR 141.24(f)(18), an obsolete provision that relates to the initial compliance period from 1993 through 1995. This statement maintains consistency with the federal regulations.

s) The Agency mudt, by a SEP, increase the number of sampling points or the frequency of monitoring if it determines that it is necessary to detect variations within the PWS.

t) Each laboratory certified for the analysis of Phase I, Phase II, or Phase V VOCs under subsection (q)(1) or (q)(2) msut do the following:

1) Determine the method detection limit (MDL), as defined in appendix B to 40 CFR 136, incorporated by reference in Section 611.102, at which it is capable of detecting the Phase I, Phase II, and Phase V VOCs; and,

2) Achieve an MDL for each Phase I, Phase II, and Phase V VOC that is less than or equal to 0.0005 mg/ℓ.

u) Each supplier must monitor, within each compliance period, at the time designated by the Agency by SEP.

v) A new system supplier or a supplier that uses a new source of water must demonstrate compliance with the MCL within a period of time specified by a permit issued by the Agency. The supplier must also comply with the initial sampling frequencies specified by the Agency to ensure the supplier can demonstrate compliance with the MCL. Routine and increased monitoring frequencies must be conducted in accordance with the requirements in this Section.

BOARD NOTE: Derived from 40 CFR 141.24(f) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.648 Phase II, Phase IIB, and Phase V Synthetic Organic Contaminants

Analysis of the Phase II, Phase IIB, and Phase V SOCs for the purposes of determining compliance with the MCL must be conducted as follows:

a) Definitions. As used in this Section, the following terms will have the following meanings:

“Detect” or “detection” means that the contaminant of interest is present at a level greater than or equal to the “detection limit~~.~~”.

“Detection limit” means the level of the contaminant of interest that is specified in subsection (r).

BOARD NOTE: This is a “trigger level” for Phase II, Phase IIB, and Phase V SOCs inasmuch as it prompts further action. The use of the term “detect” or “detection” in this Section is not intended to include any analytical capability of quantifying lower levels of any contaminant, or the “method detection limit”.

b) Required Sampling ~~sampling~~. Each supplier must take a minimum of one sample at each sampling point at the times required in subsection (q).

BOARD NOTE: See the Board note appended to Section 611.311(c) for information relating to implementation of requirements relating to aldicarb, aldicarb sulfone, and aldicarb sulfoxide.

c) Sampling Points ~~points.~~

1) Sampling Points ~~points~~ for GWSs. Unless otherwise provided by SEP, a GWS supplier must take at least one sample from each of the following points: each entry point that is representative of each well after treatment.

2) Sampling Points ~~points~~ for an SWS or Mixed System Supplier ~~mixed system supplier~~. Unless otherwise provided by SEP, an SWS or mixed system supplier must sample from each of the following points:

A) Each entry point after treatment; or

B) Points in the distribution system that are representative of each source.

3) The supplier must take each sample at the same sampling point unless the Agency has granted a SEP that designates another location as more representative of each source, treatment plant, or within the distribution system.

4) If a system draws water from more than one source, and the sources are combined before distribution, the supplier must sample at an entry point during periods of normal operating conditions when water is representative of all sources being used.

BOARD NOTE: Subsections (b) and (c) derived from 40 CFR 141.24(h)(1) through (h)(3) ~~(2013)~~.

d) Monitoring Frequency ~~frequency.~~

1) Each CWS and NTNCWS supplier must take four consecutive quarterly samples for each of the Phase II, Phase IIB, and Phase V SOCs during each compliance period, beginning in the three-year compliance period starting in the initial compliance period.

2) Suppliers serving more than 3,300 persons that do not detect a contaminant in the initial compliance period must take a minimum of two quarterly samples in one year of each subsequent three-year compliance period.

3) Suppliers serving fewer than or equal to 3,300 persons that do not detect a contaminant in the initial compliance period must take a minimum of one sample during each subsequent three-year compliance period.

e) Reduction to Annual Monitoring Frequency ~~annual monitoring frequency~~. A CWS or NTNCWS supplier may apply to the Agency for a SEP that releases it from the requirements of subsection (d). A SEP from the requirement of subsection (d) must last for only a single three-year compliance period.

f) Vulnerability Assessment ~~assessment~~. The Agency must grant a SEP from the requirements of subsection (d) based on consideration of the factors set forth at Section 611.110(a).

g) If one of the Phase II, Phase IIB, or Phase V SOCs is detected in any sample, then the following must occur:

1) The supplier must monitor quarterly for the contaminant at each sampling point that resulted in a detection.

2) Annual Monitoring ~~monitoring.~~

A) A supplier may request that the Agency grant a SEP that reduces the monitoring frequency to annual.

B) A request for a SEP must include the following minimal information:

i) For a GWS, two quarterly samples.

ii) For an SWS or mixed system supplier, four quarterly samples.

C) The Agency must grant a SEP that allows annual monitoring at a sampling point if it determines that the sampling point is reliably and consistently below the MCL.

D) In issuing the SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. Any SEP that allows less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring under subsection (g)(1) if it detects any Phase II SOC.

3) Suppliers that monitor annually must monitor during the quarters that previously yielded the highest analytical result.

4) Suppliers that have three consecutive annual samples with no detection of a contaminant at a sampling point may apply to the Agency for a SEP with respect to that point, as specified in subsections (e) and (f).

5) Monitoring for Related Contaminants ~~related contaminants.~~

A) If monitoring results in detection of one or more of the related contaminants listed in subsection (g)(5)(B), subsequent monitoring must analyze for all the related compounds in the respective group.

B) Related Contaminants ~~contaminants.~~

i) First Group ~~group.~~

aldicarb
aldicarb sulfone
aldicarb sulfoxide

BOARD NOTE: See the Board note appended to Section 611.311(c) for information relating to implementation of requirements relating to aldicarb, aldicarb sulfone, and aldicarb sulfoxide.

ii) Second Group ~~group.~~

heptachlor
heptachlor epoxide.

h) Quarterly Monitoring Following ~~monitoring following~~ MCL Violations ~~violations.~~

1) Suppliers that violate an MCL for one of the Phase II, Phase IIB, or Phase V SOCs, as determined by subsection (k), must monitor quarterly for that contaminant at the sampling point where the violation occurred, beginning the next quarter after the violation.

2) Annual Monitoring ~~monitoring.~~

A) A supplier may request that the Agency grant a SEP that reduces the monitoring frequency to annual.

B) A request for a SEP must include, at a minimum, the results from four quarterly samples.

C) The Agency must grant a SEP that allows annual monitoring at a sampling point if it determines that the sampling point is reliably and consistently below the MCL.

D) In issuing the SEP, the Agency must specify the level of the contaminant upon which the "reliably and consistently" determination was based. Any SEP that allows less frequent monitoring based on an Agency "reliably and consistently" determination must include a condition requiring the supplier to resume quarterly monitoring under subsection (h)(1) if it detects any Phase II SOC.

E) The supplier must monitor during the quarters that previously yielded the highest analytical result.

i) Confirmation Samples ~~samples.~~

1) If any of the Phase II, Phase IIB, or Phase V SOCs are detected in a sample, the supplier must take a confirmation sample as soon as possible, but no later than 14 days after the supplier receives notice of the detection.

2) Averaging is as specified in subsection (k).

3) The Agency must delete the original or confirmation sample if it determines that a sampling error occurred, in which case the confirmation sample will replace the original or confirmation sample.

j) This subsection (j) corresponds with 40 CFR 141.24(h)(10), an optional USEPA provision relating to compositing of samples that USEPA does not require for state programs. This statement maintains structural consistency with USEPA rules.

k) Compliance with the MCLs for the Phase II, Phase IIB, and Phase V SOCs must be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the supplier is in violation of the MCL.

1) For a supplier that monitors more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

2) A supplier that monitors annually or less frequently whose sample result exceeds the regulatory detection level as defined by subsection (r) must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

3) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the supplier is out of compliance with the MCL immediately.

4) If a supplier fails to collect the required number of samples, compliance will be based on the total number of samples collected.

5) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

l) This subsection (l) corresponds with 40 CFR 141.24(h)(12), which USEPA removed and reserved. This statement maintains structural consistency with the federal regulations.

m) Analysis for PCBs must be conducted as follows using the methods in Section 611.645:

1) Each supplier that monitors for PCBs must analyze each sample using either USEPA ~~Organic Methods, Method~~ 505 (95) or USEPA ~~Method~~ 508 (95).

2) If PCBs are detected in any sample analyzed using USEPA Organic Methods, Method 505 (95) or USEPA 508 (95), the supplier must reanalyze the sample using USEPA ~~Method~~ 508A (89) to quantitate the individual Aroclors (as decachlorobiphenyl).

3) Compliance with the PCB MCL must be determined based upon the quantitative results of analyses using USEPA ~~Organic Methods, Method~~ 508A (89).

n) This subsection (n) corresponds with 40 CFR 141.24(h)(14), an obsolete provision that relates to the initial compliance period from 1993 through 1995. This statement maintains consistency with the federal regulations.

o) The Agency must issue a SEP that increases the number of sampling points or the frequency of monitoring if it determines that this is necessary to detect variations within the PWS due to such factors as fluctuations in contaminant concentration due to seasonal use or changes in the water source.

BOARD NOTE: At 40 CFR 141.24(h)(15), USEPA uses the stated factors as non-limiting examples of circumstances that make additional monitoring necessary.

p) This subsection (p) corresponds with 40 CFR 141.24(h)(16), a USEPA provision relating to reserving enforcement authority to the State that would serve no useful function as part of the State's rules. This statement maintains structural consistency with USEPA rules.

q) Each supplier must monitor, within each compliance period, at the time designated by the Agency by SEP.

r) "Detection" means greater than or equal to the following concentrations for each contaminant:

1) For ~~for~~ PCBs (Aroclors), the following:

Aroclor	Detection Limit (mg/ℓ)
1016	0.00008
1221	0.02
1232	0.0005
1242	0.0003
1248	0.0001
1254	0.0001
1260	0.0002

2) For ~~for~~ other Phase II, Phase IIB, and Phase V SOCs, the following:

Contaminant	Detection Limit (mg/ℓ)
Alachlor	0.0002
Aldicarb	0.0005
Aldicarb sulfoxide	0.0005
Aldicarb sulfone	0.0008
Atrazine	0.0001
Benzo(a)pyrene	0.00002
Carbofuran	0.0009
Chlordane	0.0002
2,4-D	0.0001
Dalapon	0.001
1,2-Dibromo-3-chloropropane (DBCP)	0.00002
Di(2-ethylhexyl)adipate	0.0006
Di(2-ethylhexyl)phthalate	0.0006
Dinoseb	0.0002
Diquat	0.0004
Endothall	0.009
Endrin	0.00001
Ethylene dibromide (EDB)	0.00001
Glyphosate	0.006
Heptachlor	0.00004
Heptachlor epoxide	0.00002
Hexachlorobenzene	0.0001
Hexachlorocyclopentadiene	0.0001
Lindane	0.00002

Methoxychlor	0.0001
Oxamyl	0.002
Picloram	0.0001
Polychlorinated biphenyls (PCBs) (as decachlorobiphenyl)	0.0001
Pentachlorophenol	0.00004
Simazine	0.00007
Toxaphene	0.001
2,3,7,8-TCDD (dioxin)	0.000000005
2,4,5-TP (silvex)	0.0002

BOARD NOTE: See the Board note appended to Section 611.311(c) for information relating to implementation of requirements relating to aldicarb, aldicarb sulfone, and aldicarb sulfoxide.

s) Laboratory Certification ~~certification.~~

1) Analyses under this Section must only be conducted by a laboratory in one of the categories listed in Section 611.490(a) that has been certified according to the conditions of subsection (s)(2).

2) To receive certification to conduct analyses for the Phase II, Phase IIB, and Phase V SOCs, the laboratory must do the following:

A) Analyze PE samples provided by the Agency under 35 Ill. Adm. Code 183.125(c) that include these substances; and

B) Achieve quantitative results on the analyses performed under subsection (s)(2)(A) that are within the following acceptance limits:

SOC	Acceptance Limits
Alachlor	± 45%
Aldicarb	2 standard deviations
Aldicarb sulfone	2 standard deviations
Aldicarb sulfoxide	2 standard deviations

Atrazine	± 45%
Benzo(a)pyrene	2 standard deviations
Carbofuran	± 45%
Chlordane	± 45%
Dalapon	2 standard deviations
Di(2-ethylhexyl)adipate	2 standard deviations
Di(2-ethylhexyl)phthalate	2 standard deviations
Dinoseb	2 standard deviations
Diquat	2 standard deviations
Endothall	2 standard deviations
Endrin	± 30%
Glyphosate	2 standard deviations
Dibromochloropropane (DBCP)	± 40%
Ethylene dibromide (EDB)	± 40%
Heptachlor	± 45%
Heptachlor epoxide	± 45%
Hexachlorobenzene	2 standard deviations
Hexachlorocyclopentadiene	2 standard deviations
Lindane	± 45%
Methoxychlor	± 45%
Oxamyl	2 standard deviations
PCBs (as decachlorobiphenyl)	0-200%
Pentachlorophenol	± 50%
Picloram	2 standard deviations
Simazine	2 standard deviations

Toxaphene	± 45%
2,4-D	± 50%
2,3,7,8-TCDD (dioxin)	2 standard deviations
2,4,5-TP (silvex)	± 50%

BOARD NOTE: See the Board note appended to Section 611.311(c) for information relating to implementation of requirements relating to aldicarb, aldicarb sulfone, and aldicarb sulfoxide.

t) A new system supplier or a supplier that uses a new source of water must demonstrate compliance with the MCL within a period of time specified by a permit issued by the Agency. The supplier must also comply with the initial sampling frequencies specified by the Agency to ensure the supplier can demonstrate compliance with the MCL. Routine and increased monitoring frequencies must be conducted in accordance with the requirements in this Section.

BOARD NOTE: Derived from 40 CFR 141.24(h)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART Q: RADIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.720 Analytical Methods

a) The methods specified below, or alternative methods approved by the Agency under ~~pursuant to~~ Section 611.480, incorporated by reference in Section 611.102, are to be used to determine compliance with Section 611.330, except in cases where alternative methods have been approved in accordance with Section 611.480.

1) Gross Alpha and Beta~~.~~

A) Evaporation Methods. SM 302 (71); SM 7110 B (85); SM 7110 B (91); SM 7110 B (96); SM 7110 B (00); USEPA 900.0 (80); USEPA 900.0 (18); USEPA 00-01 (84); USEPA IRM (76), pages 1-3; USEPA RCA (79), pages 1-5; or USGS R1120-76.

B) Liquid Scintillation Methods. ASTM D7283-17 or SM 7110 D (17).

~~A) Standard Methods.~~

~~i) Evaporation.: Method 302, 13th ed.; or~~

~~ii) Evaporation.: Method 7110 B, 17th, 18th, 19th, 20th, 21st, or 22nd, or 23rd ed.;~~

~~B) Evaporation.: USEPA Interim Radiochemical Methods: pages 1-3;~~

~~C) Evaporation: USEPA Radioactivity Methods, Method 900.0;~~

~~D) Evaporation: USEPA Radiochemical Analyses: pages 1-5;~~

~~E) Evaporation: USEPA Radiochemistry Procedures, Method 00-01; or~~

~~F) Evaporation: USGS Method R-1120-76.~~

~~G) Liquid scintillation: ASTM Method D7283-17.~~

~~H) Liquid scintillation: Standard Methods Online, Method 7110 D-17.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7110 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 7110 B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added ASTM Method D7283-17 and Standard Methods Online, Method 7110 D-17 as approved alternative methods on July 27, 2017 (at 82 Fed. Reg. 34861).~~

2) Gross Alpha. Coprecipitation Methods. SM 7110 C (91), SM 7110 C (96), SM 7110 C (00), or USEPA 00-02 (84).

~~A) Coprecipitation: Standard Methods, 18th, 19th, 20th, 21st, or 22nd ed., Method 7110 C; or~~

~~B) Coprecipitation: USEPA Radiochemistry Procedures, Method 00-02.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7110 C as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). See the comment appended to 611.611(a)(2)(D)(ii) re Standard Methods Online, Method 3113 B-04 for antimony. USEPA added Standard Methods, 22nd ed., Method 7110 C as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463).~~

3) Radium-226~~.~~

A) Radiochemical Methods. ASTM D2460-97; ASTM D2460-07; Georgia Radium (04); New York Radium (82); SM 304 (71); SM 7500-Ra B (88); SM 7500-Ra B (93); SM 7500-Ra B (01); USEPA 903.0 (80); USEPA Ra-03 (84); USEPA IRM (76), pages 13-15; USEPA RCA (79), pages 19-32; or USGS R-1140-76.

B) Radon Emanation Methods. ASTM D3454-97; ASTM D3454-05; EML (97) Ra-04; EML (90) Ra-05; SM 305 (71); SM 7500-Ra C (88); SM 7500-Ra C (93); SM 7500-Ra C (01); USEPA 903.1 (80); USEPA Ra-04 (84); USEPA IRM (76), pages 16-23; or USGS R-1141-76.

C) Gamma Spectrometry. SM 7500-Ra E (01) or SM 7500-Ra E (07).

~~A) ASTM Methods.~~

  ~~i) Radiochemical: Method D2460-97 or D2460-07; or~~

  ~~ii) Radon Emanation. emanation: Method D3454-97 or D3454-05;~~

~~B) Radiochemical: New York Radium Method;~~

~~C) Standard Methods.~~

  ~~i) Radiochemical: Method 304, 13th ed.;~~

  ~~ii) Radon emanation: Method 305, 13th ed.;~~

  ~~iii) Radiochemical: Method 7500-Ra B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.; or~~

  ~~iv) Radon emanation: Method 7500-Ra C, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

  ~~v) Gamma spectrometry: Method 7500-Ra E, 22nd ed.;~~

~~D) Radon emanation: EML Procedures Manual (27th or 28th ed.), Method Ra-04;~~

~~E) USEPA Interim Radiochemical Methods:~~

  ~~i) Radiochemical: pages 13-15; or~~

  ~~ii) Radon emanation: pages 16-23;~~

~~F) USEPA Radioactivity Methods:~~

  ~~i) Radiochemical: Method 903.0; or~~

~~ii) Radon emanation: Method 903.1;~~

~~G) Radiochemical: USEPA Radiochemical Analyses, pages 19-32;~~

~~H) Radiochemical: USEPA Radiochemistry Procedures:~~

~~i) Radiochemical: Method Ra-03; or~~

~~ii) Radon emanation: Method Ra-04; or~~

~~I) USGS Methods.~~

~~i) Radiochemical: USGS Method R-1140-76; or~~

~~ii) Radon emanation: USGS Method R-1141-76.~~

~~J) Radiochemical: Georgia Radium Method.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7500-Ra B and C as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D2460-07 and D3454-05 as approved alternative methods on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Methods 7500-Ra B and C as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods, 22nd ed., Method 7500-Ra E as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

4) Radium-228~~.~~

A) Radiochemical Methods. Georgia Radium (04); New Jersey Radium (90); New York Radium (82); SM 7500-Ra D (88); SM 7500-Ra D (93); SM 7500-Ra D (01); USEPA 904.0 (80); USEPA Ra-05 (90); USEPA IRM (76), pages 24-28; USEPA RCA (79), pages 19-32; or USGS R-1142-76.

B) Gamma Spectrometry. SM 7500-Ra E (01) or SM 7500-Ra E (07).

~~A) Standard Methods:~~

~~i) Radiochemical: Method 7500-Ra D (Standard Methods, 17th, 18th, 19th, 20th, 21st, or 22nd ed.);~~

~~ii) Gamma spectrometry: Method 7500-Ra E (Standard Methods, 22nd ed.);~~

~~B) Radiochemical: New York Radium Method;~~

~~C) Radiochemical: USEPA Interim Radiochemical Methods, pages 24-28;~~

~~D) Radiochemical: USEPA Radioactivity Methods, Method 904.0;~~

~~E) Radiochemical: USEPA Radiochemical Analyses, pages 19-32;~~

~~F) Radiochemical: USEPA Radiochemistry Procedures, Method Ra-05;~~

~~G) Radiochemical: USGS Method R-1142-76;~~

~~H) Radiochemical: New Jersey Radium Method; or~~

~~I) Radiochemical: Georgia Radium Method.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-Ra D as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 7500-Ra D as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods, 22nd ed., Method 7500-Ra E as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861).~~

5) Uranium~~.~~

A) Radiochemical Methods. SM 7500-U B (88), SM 7500-U B (91), SM 7500-U B (96), SM 7500-U B (00), or USEPA 908.0 (80).

B) Fluorometric Methods. ASTM D2907-97, EML (90) U-04, EML (97) U-04, SM 7500-U C (88), SM 7500-U C (91), SM 7500-U C (96), SM 7500-U C (00), USEPA 908.1 (80), USGS R-1180-76, or USGS R-1181-76.

C) ICP-MS Methods. ASTM D5673-03, ASTM D5673-05, ASTM D5673-10, ASTM D5673-16; SM 3125 (97); or USEPA 200.8 (94).

D) Alpha Spectrometry. ASTM D3972-97; ASTM D3972-02; ASTM D3972-09; EML (90) U-02; EML (97) U-02; USEPA 00-07 (84); USEPA RCA (79), pages 33-48; or USGS R-1182-76.

E) Laser Spectrometry. ASTM D5174-97, ASTM D5174-02, or ASTM D5174-07.

F) Alpha Liquid Scintillation Spectrometry. ASTM D6239-09.

~~A) Standard Methods, 17th, 18th, 19th, 20th, 21st, or 22nd ed.:~~

  - ~~i) Radiochemical: Method 7500-U B; or~~
  - ~~ii) Fluorometric: Method 7500-U C;~~
- ~~B) ICP-MS: Standard Methods, 20th or 21st ed., Method 3125;~~
- ~~C) ASTM Methods.~~
  - ~~i) Fluorometric: Method D2907-97;~~
  - ~~ii) Alpha spectrometry: Method D3972-97, D3972-02, or D3972-09;~~
  - ~~iii) Laser spectrometry: Method D5174-97, D5174-02, or D5174-07;~~
  - ~~iv) ICP-MS: Method D5673-03, Method D5673-05, or Method D5673-10; or~~
  - ~~v) Alpha liquid scintillation spectrometry: Method D6239-09;~~
- ~~D) USEPA Radioactivity Methods:~~
  - ~~i) Radiochemical: Method 908.0; or~~
  - ~~ii) Fluorometric: Method 908.1;~~
- ~~E) ICP-MS: USEPA Environmental Metals Methods, Method 200.8 (rev. 5.3);~~
- ~~F) Alpha spectrometry: USEPA Radiochemical Analyses, pages 33-48;~~
- ~~G) Alpha spectrometry: USEPA Radiochemistry Procedures, Method 00-07;~~
- ~~H) EML Procedures Manual (27th or 28th ed.):~~
  - ~~i) Alpha spectrometry: Method U-02; or~~
  - ~~ii) Fluorometric: Method U-04; or~~
- ~~I) USGS Methods.~~
  - ~~i) Fluorometric: USGS Method R-1180-76;~~
  - ~~ii) Fluorometric: USGS Method R-1181-76; or~~
  - ~~iii) Alpha spectrometry: USGS Method R-1182-76.~~

BOARD NOTE: If uranium (U) is determined by mass, a conversion factor of 0.67 pCi/µg of uranium must be used. This conversion factor is based on the 1:1 activity ratio of ^{234}U and ^{238}U that is characteristic of naturally occurring uranium.

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-U B and Method 7500-U C and ASTM Method D5673-05 as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D5174-07 as an approved alternative method on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added ASTM Method D3972-09 as an approved alternative method on June 24, 2011 (at 76 Fed. Reg. 37014). USEPA added Standard Methods, 21st ed., Method 3125 and ASTM Methods D5673-10 and D6329-09 as approved alternative methods on June 3, 2012 (at 77 Fed. Reg. 38523). USEPA added Standard Methods, 22nd ed., Methods 7500-U B and C as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

6) Radioactive Cesium~~.~~

A) Radiochemical Methods. ASTM D2459-72; SM 7500-Cs B (88), SM 7500-Cs B (93); SM 7500-Cs B (00); USEPA 901.0 (80); USEPA IRM (76), pages 4-5; or USGS R-1111-76.

B) Gamma Ray Spectrometry. ASTM D3649-91; ASTM D3649-98a; ASTM D3649-06; EML (90) Ga-01; EML (97) Ga-01-R; SM 7120 (94); SM 7120 (97); USEPA 901.1 (80); USEPA RCA (79), pages 92-95; or USGS R-1110-76.

~~A) ASTM Methods.~~

~~i) Radiochemical: Method D2459-72; or~~

~~ii) Gamma ray spectrometry: Method D3649-91, D3649-98a, or D3649-06;~~

~~B) Standard Methods.~~

~~i) Gamma ray spectrometry: Method 7120, 19th, 20th, 21st, or 22nd ed.; or~~

~~ii) Radiochemical: Method 7500-Cs B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~C) Gamma ray spectrometry: EML Procedures Manual (27th or 28th ed.), Method Ga-01-R;~~

~~D) Radiochemical: USEPA Interim Radiochemical Methods, pages 4-5;~~

~~E) USEPA Radioactivity Methods:~~

~~i) Radiochemical: Method 901.0; or~~

~~ii) Gamma ray spectrometry: Method 901.1;~~

~~F) Gamma ray spectrometry: USEPA Radiochemical Analyses, pages 92-95; or~~

~~G) USGS Methods.~~

~~i) Gamma ray spectrometry: USGS Method R-1110-76; or~~

~~ii) Radiochemical: USGS Method R-1111-76.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7120 and 7500-Cs B as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3649-06 as an approved alternative method on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Methods 7120 and 7500-Cs B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

7) Radioactive Iodine~~.~~

A) Radiochemical Methods. ASTM D3649-91; ASTM D3649-98a; ASTM D3649-06; SM 7500-I B (88); SM 7500-I B (93); SM 7500-I B (00); SM 7500-I C (88); SM 7500-I C (93); SM 7500-I C (00); SM 7500-I D (88); SM 7500-I D (93); SM 7500-I D (00); USEPA 902.0 (80); USEPA IRM (76), pages 6-8; or USEPA IRM (76), pages 9-12.

B) Gamma Ray Spectrometry. ASTM D4785-93; ASTM D4785-00a; ASTM D4785-08; EML (90) Ga-01; EML (97) Ga-01-R; SM 7120 (94); SM 7120 (97); USEPA 901.1 (80); or USEPA RCA (79), pages 92-95.

~~A) ASTM Methods.~~

~~i) Radiochemical: D3649-91, D3649-98a, or D3649-06; or~~

~~ii) Gamma ray spectrometry: D4785-93, D4785-00a, or D4785-08;~~

~~B) Standard Methods.~~

~~i) Method 7120, 19th, 20th, 21st, or 22nd ed.;~~

~~ii) Radiochemical: Method 7500-I B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~iii) Radiochemical: Method 7500-I C, 17th, 18th, 19th, 20th, 21st, or 22nd ed.; or~~

~~iv) Radiochemical: Method 7500-I D, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~C) Gamma ray spectrometry: EML Procedures Manual (27th or 28th ed.), Method Ga-01-R;~~

~~D) Radiochemical: USEPA Interim Radiochemical Methods, pages 6-8 or 9-12;~~

~~E) Gamma ray spectrometry: USEPA Radiochemical Analyses, pages 92-95; or~~

~~F) USEPA Radioactivity Methods:i) Gamma ray spectrometry: Method 901.1; or~~

~~ii) Radiochemical: Method 902.0.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7120 and 7500-I B, C, and D as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3649-06 and D4785-08 as approved alternative methods on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Methods 7120 and 7500-I B, C, and D as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

8) Radioactive Strontium-89 and -90~~90~~. Radiochemical Methods. EML (90) Sr-01; EML (97) Sr-01; EML (90) Sr-02; EML (97) Sr-02; SM 303 (71); SM 7500-Sr B (88); SM 7500-Sr B (93); SM 7500-Sr B (01); USEPA 905.0 (80); USEPA Sr-04 (84); USEPA IRM (76), pages 29-33; USEPA RCA (79), pages 65-73; or USGS R-1160-76.

~~A) Standard Methods.~~

~~i) Radiochemical: Method 303, 13th ed.; or~~

~~ii) Radiochemical: Method 7500-Sr B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~B) Radiochemical: EML Procedures Manual (27th or 28th ed.), Method Sr-01 or Sr-02.~~

~~C) Radiochemical: USEPA Interim Radiochemical Methods, pages 29-33;~~

~~D) Radiochemical: USEPA Radioactivity Methods, Method 905.0;~~

~~E) Radiochemical: USEPA Radiochemical Analyses, pages 65-73;~~

~~F) Radiochemical: USEPA Radiochemistry Procedures, Method Sr-04; or~~

~~G) Radiochemical: USGS Method R-1160-76.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-Sr B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Standard Methods, 22nd ed., Method 7500-Sr B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463).~~

9) Tritium. Liquid Scintillation. ASTM D4107-91; ASTM D4107-98; ASTM D4107-08; SM 306 (71); SM 7500-^{3}H B (88); SM 7500-^{3}H B (93); SM 7500-^{3}H B (00); USEPA 906.0 (80); USEPA H-02 (84); USEPA IRM (76), pages 34-37; USEPA RCA (79), pages 87-91; or USGS R-1171-76.

~~A) Liquid scintillation: ASTM Methods: Method D4107-91, D4107-98, or D4107-08;~~

~~B) Standard Methods.~~

~~i) Liquid scintillation: Method 306, 13th ed.; or~~

~~ii) Liquid scintillation: Method 7500-^{3}H B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~C) Liquid scintillation: USEPA Interim Radiochemical Methods, pages 34-37;~~

~~D) Liquid scintillation: USEPA Radioactivity Methods, Method 906.0;~~

~~E) Liquid scintillation: USEPA Radiochemical Analyses, pages 87-91;~~

~~F) Liquid scintillation: USEPA Radiochemistry Procedures, Method H-02; or~~

~~G) Liquid scintillation: USGS Method R-1171-76.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-^{3}H B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D4107-08 as an approved alternative method on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Method 7500-^{3}H B as an approved alternative method on June 21, 2013 (at 78 Fed. Reg. 37463).~~

10) Gamma Emitters. Gamma Ray Spectrometry. ASTM D3649-91; ASTM D3649-98a; ASTM D3649-06; ASTM D4785-93; ASTM D4785-00a; ASTM D4785-08; EML (90) Ga-01; EML (97) Ga-01-R; SM 7120 (94); SM 7120 (97); SM 7500-Cs B (88); SM 7500-Cs B (93); SM 7500-Cs B (00); SM 7500-I B (88); SM 7500-I B (93); SM 7500-I B (00); USEPA 901.0 (80); USEPA 901.1 (80); USEPA 902.0 (80); USEPA RCA (79), pages 92-95; or USGS R-1110-76.

~~A) ASTM Methods.~~

~~i) Gamma ray spectrometry: Method D3649-91, D3649-98a, or D3649-06; or~~

~~ii) Gamma ray spectrometry: Method D4785-93, D4785-00a, or D4785-08;~~

~~B) Standard Methods.~~

~~i) Gamma ray spectrometry: Method 7120, 19th, 20th, 21st, or 22nd ed.;~~

~~ii) Gamma ray spectrometry: Method 7500-Cs B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.; or~~

~~iii) Gamma ray spectrometry: Method 7500-I B, 17th, 18th, 19th, 20th, 21st, or 22nd ed.;~~

~~C) Gamma ray spectrometry: Procedures Manual (27th or 28th ed.), Method Ga-01-R;~~

~~D) Gamma ray spectrometry: USEPA Radioactivity Methods, Methods 901.0, 901.1, or 902.0;~~

~~E) Gamma ray spectrometry: USEPA Radiochemical Analyses, pages 92-95; or~~

~~F) Gamma ray spectrometry: USGS Method R-1110-76.~~

~~BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7120, 7500-Cs B, and 7500-I B as approved alternative methods on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3649-08 and D4785-08 as approved alternative methods on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Methods 7120, 7500-Cs B, and 7500-I B as approved alternative methods on June 21, 2013 (at 78 Fed. Reg. 37463).~~

b) When the identification and measurement of radionuclides other than those listed in subsection (a) are required, the following methods, incorporated by reference in

Section 611.102, are to be used, except in cases where alternative methods have been approved in accordance with Section 611.480:

1) USEPA ARP (73)~~Aqueous Radiochemical Procedures~~.

2) EML (90) or EML (97)~~ Procedures Manual (27th or 28th ed.)~~.

c) For the purpose of monitoring radioactivity concentrations in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit must be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96σ, where σ is the standard deviation of the net counting rate of the sample).

1) To determine compliance with Section 611.330(b), (c), and (e), the detection limit must not exceed the concentrations set forth in the following table:

Contaminant	Detection Limit
Gross alpha particle activity	3 pCi/ℓ
Radium-226	1 pCi/ℓ
Radium-228	1 pCi/ℓ
Uranium	1 µg/ℓ

BOARD NOTE: Derived from 40 CFR 141.25(c) Table B~~ (2017)~~.

2) To determine compliance with Section 611.330(d), the detection limits must not exceed the concentrations listed in the following table:

Radionuclide	Detection Limit
Tritium	1,000 pCi/ℓ
Strontium-89	10 pCi/ℓ
Strontium-90	2 pCi/ℓ
Iodine-131	1 pCi/ℓ
Cesium-134	10 pCi/ℓ
Gross beta	4 pCi/ℓ
Other radionuclides	1/10 of applicable limit

BOARD NOTE: Derived from 40 CFR 141.25(c) Table C ~~(2017)~~.

d) To judge compliance with the MCLs listed in Section 611.330, averages of data must be used and must be rounded to the same number of significant figures as the MCL for the substance in question.

BOARD NOTE: Derived from 40 CFR 141.25 and appendix A to subpart C of 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Methods 7110 B-91 and 7110 C-91 appear in the 18th and 19th editions as Methods 7110 B and 7110 C. In this Section, these appear as SM 7110 B (91) and SM 7110 C (91).

Standard Methods Online, Methods 7110 B-00 and 7110 C-00 appear in the 21st, 22nd, and 23rd editions as Methods 7110 B and 7110 C. In this Section, these appear as SM 7110 B (00) and SM 7110 C (00).

Standard Methods Online, Method 7120-97 appears in the 20th, 21st, 22nd, and 23rd editions as Method 7120. In this Section, this appears as SM 7120 (97).

Standard Methods Online, Method 7500-Cs B-00 appears in the 21st, 22nd, and 23rd editions as Method 7500-Cs B. In this Section, thus appears as SM 7500-Cs B (00).

Standard Methods Online, Methods 7500-I B-00, 7500-I C-00, and 7500-I D-00 appear in the 21st, 22nd, and 23rd editions as Methods 7500-I B, 7500-I C, and 7500-I D. In this Section, these appear as SM 7500-I B (00), SM 7500-I C (00), and SM 7500-I D (00).

Standard Methods Online, Methods 7500-Ra B-01, 7500-Ra C-01, and 7500-Ra D-01 appears in the 21st and 22nd editions as Methods 7500-Ra B, 7500-Ra C, and 7500-Ra D. In this Section, these appear as SM 7500-Ra B (01), SM 7500-Ra C (01), and SM 7500-Ra D (01).

Standard Methods Online, Methods 7500-Ra B-07, 7500-Ra C-07, 7500-Ra D-07, and 7500-Ra E-07 appears in the 23rd edition as Methods 7500-Ra B, 7500-Ra C, 7500-Ra D, and 7500-Ra E. In this Section, these appear as SM 7500-Ra B (07), SM 7500-Ra C (07), SM 7500-Ra D (07), and SM 7500-Ra E (07).

Standard Methods Online, Method 7500-Sr B-01 appears in the 21st, 22nd, and 23rd editions as Method 7500-Sr B. In this Section, this appears as SM 7500-Sr B (01).

Standard Methods Online, Method 7500-^{3}H B-00 appears in the 21st, 22nd, and 23rd editions as Method 7500-^{3}H B. In this Section, this appears as SM 7500-^{3}H B (00)

Standard Methods Online, Methods 7500-U B and 7500-U C-00 appear in the 21st, 22nd, and 23rd editions as Methods 7500-U B and 7500-U C. In this Section, these appear as SM 7500-U B (00) and SM 7500-U C (00).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.731 Gross Alpha

Monitoring requirements for gross alpha particle activity, radium-226, radium-228, and uranium are as follows:

a) A community water system (CWS) supplier must conduct initial monitoring to determine compliance with Section 611.330(b), (c), and (e). For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in Section 611.720(c).

1) Applicability and Sampling Location ~~sampling location~~ for an Existing ~~existing~~ CWS Supplier ~~supplier~~. An existing CWS supplier using groundwater, surface water, or both groundwater and surface water (for the purpose of this Section hereafter referred to as a supplier) must sample at every entry point to the distribution system that is representative of all sources being used (hereafter called a sampling point) under normal operating conditions. The supplier must take each sample at the same sampling point, unless conditions make another sampling point more representative of each source or the Agency has designated a distribution system location, in accordance with subsection (b)(2)(C).

2) Applicability and Sampling Location ~~sampling location~~ for a New ~~new~~ CWS Supplier ~~supplier~~. A new CWS supplier or a CWS supplier that uses a new source of water must begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. A CWS supplier must conduct more frequent monitoring when ordered by the Agency in the event of possible contamination or when changes in the distribution system or treatment processes occur that may increase the concentration of radioactivity in finished water.

b) Initial Monitoring. ~~monitoring:~~ A CWS supplier must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

1) A CWS supplier without acceptable historical data, as defined in subsection (b)(2), is required to have collected four consecutive quarterly samples at all sampling points before December 31, 2007.

2) Grandfathering Data. ~~of data:~~ A CWS supplier may use historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, under the following situations.

A) To satisfy initial monitoring requirements, a CWS supplier having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

B) To satisfy initial monitoring requirements, a CWS supplier with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

C) To satisfy initial monitoring requirements, a CWS supplier with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Agency finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between entry points. The Agency must make its finding in writing, by a SEP, indicating how the data conforms to the requirements of this subsection (b)(2).

3) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Agency may, by a SEP, waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.

4) If the average of the initial monitoring results for a sampling point is above the MCL, the supplier must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the supplier enters into another schedule as part of a formal compliance agreement with the Agency.

c) Reduced Monitoring. ~~monitoring:~~ The Agency may allow a CWS supplier to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point, based on the following criteria:

1) If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in the table at Section 611.720(c)(1), the supplier must collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

2) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below one-half the MCL, the supplier must collect and analyze for that contaminant using at least one sample at that sampling point every

six years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below one-half the MCL, the supplier must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

3) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above one-half the MCL but at or below the MCL, the supplier must collect and analyze at least one sample at that sampling point every three years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above one-half the MCL but at or below the MCL, the supplier must collect and analyze at least one sample at that sampling point every three years.

4) A supplier must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a supplier's sampling point is on a nine year monitoring period, and the sample result is above one-half the MCL, then the next monitoring period for that sampling point is three years).

5) If a supplier has a monitoring result that exceeds the MCL while on reduced monitoring, the supplier must collect and analyze quarterly samples at that sampling point until the supplier has results from four consecutive quarters that are below the MCL, unless the supplier enters into another schedule as part of a formal compliance agreement with the Agency.

d) Compositing.~~:~~ To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a supplier may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year after the first sample. The analytical results from the composited sample must be treated as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than one-half the MCL, the Agency may, by a SEP, direct the supplier to take additional quarterly samples before allowing the supplier to sample under a reduced monitoring schedule.

e) A gross alpha particle activity measurement may be substituted for the required radium-226 measurement, provided that the measured gross alpha particle activity does not exceed 5 pCi/ℓ. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/ℓ.

1) The gross alpha measurement must have a confidence interval of 95% (1.65σ, where σ is the standard deviation of the net counting rate of the sample) for radium-226 and uranium.

2) When a supplier uses a gross alpha particle activity measurement in lieu of a radium-226 or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 or uranium.

3) If the gross alpha particle activity result is less than detection, one-half the detection limit will be used to determine compliance and the future monitoring frequency.

BOARD NOTE: Subsections (a) through (e) derive from 40 CFR 141.26(a) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.732 Beta Particle and Photon Radioactivity

Monitoring and Compliance Requirements ~~compliance requirements~~ for Manmade Radioactivity ~~manmade radioactivity~~. To determine compliance with the maximum contaminant levels in Section 611.330(d) for beta particle and photon radioactivity, a supplier must monitor at a frequency as follows:

a) A CWS supplier (either a surface water or groundwater supplier) designated by the Agency, by a SEP, as vulnerable must sample for beta particle and photon radioactivity. A supplier must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Agency. A supplier already designated by the Agency must continue to sample until the Agency reviews and either reaffirms or removes the designation, by a SEP.

1) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/ℓ (screening level), the Agency may reduce the frequency of monitoring at that sampling point to once every three years. A supplier must collect all samples required in subsection (a) during the reduced monitoring period.

2) For a supplier in the vicinity of a nuclear facility, the Agency may allow the CWS supplier to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the supplier's entry points, where the Agency determines if such data is applicable to a particular water system, by a SEP. In the event that there is a release from a nuclear facility, a supplier that is using surveillance data must begin monitoring at the community water supplier's entry points in accordance with subsection (b)(1).

b) A CWS supplier (either a surface water or groundwater supplier) designated by the Agency, by a SEP, as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. A supplier must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Agency. A supplier already designated by the Agency as a supplier using waters contaminated by effluents from nuclear facilities must continue to sample until the Agency reviews and either reaffirms or removes the designation, by a SEP.

1) Quarterly monitoring for gross beta particle activity must be based on the analysis of monthly samples or the analysis of a composite of three monthly samples.

BOARD NOTE: In corresponding 40 CFR 141.26(b)(2)(i), USEPA recommends the use of a composite of three monthly samples.

2) For iodine-131, a composite of five consecutive daily samples must be analyzed once each quarter. The Agency must require, by a SEP, more frequent monitoring for iodine-131 where iodine-131 is identified in the finished water.

3) Annual monitoring for strontium-90 and tritium must be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples.

BOARD NOTE: In corresponding 40 CFR 141.26(b)(2)(iii), USEPA recommends the analysis of four consecutive quarterly samples.

4) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/ℓ, the Agency may, by a SEP, reduce the frequency of monitoring at that sampling point to once every three years. The supplier must collect the same type of samples required in subsection (b) during the reduced monitoring period.

5) For a supplier in the vicinity of a nuclear facility, the Agency may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry points, where the Agency determines, by a SEP, that such data is applicable to the particular water system. In the event that there is a release from a nuclear facility, a supplier that uses such surveillance data must begin monitoring at the CWS's entry points in accordance with subsection (b).

c) A CWS supplier designated by the Agency to monitor for beta particle and photon radioactivity cannot apply to the Agency for a waiver from the monitoring frequencies specified in subsection (a) or (b).

d) A CWS supplier may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. A supplier is allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/ℓ) by a factor of 0.82.

e) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with Section 611.330(d)(1), using the formula in Section 611.330(d)(2). Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

f) A supplier must monitor monthly at the sampling points that exceeds the maximum contaminant level in Section 611.330(d) beginning the month after the exceedance ~~exceedence~~ occurs. A supplier must continue monthly monitoring until the supplier has established, by a rolling average of three monthly samples, that the MCL is being met. A supplier that establishes that the MCL is being met must return to quarterly monitoring until it meets the requirements set forth in subsection (a)(1) or (b)(4).

BOARD NOTE: Derived from 40 CFR 141.26(b)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.733 General Monitoring and Compliance Requirements

a) The Agency may, by a SEP, require more frequent monitoring than specified in Sections 611.731 and 611.732 or may require confirmation samples. The results of the initial and confirmation samples will be averaged for use in a compliance determination.

b) Each PWS supplier must monitor at the time designated by the Agency during each compliance period.

c) Compliance.~~:~~ compliance with Section 611.330(b) through (e) must be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the supplier is in violation of the MCL.

1) For a supplier monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the supplier is out of compliance with the MCL.

2) For a supplier monitoring more than once per year, if any sample result would cause the running average to exceed the MCL at any single sampling point, the supplier is immediately out of compliance with the MCL.

3) A ~~a~~ supplier must include all samples taken and analyzed under the provisions of this Section and Sections 611.731 and 611.732 in determining compliance, even if that number is greater than the minimum required.

4) If a supplier does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

5) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 or uranium. If the gross alpha particle activity result is less than detection, one-half the detection limit will be used to calculate the annual average.

d) The Agency may, by a SEP, allow the supplier to delete results of obvious sampling or analytic errors.

e) If the MCL for radioactivity set forth in Section 611.330 (b) through (e) is exceeded, the operator of a CWS must give notice to the Agency under Section 611.840 and to the public, as required by Subpart V.

BOARD NOTE: Derived from 40 CFR 141.26(c) ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART R: ENHANCED FILTRATION AND DISINFECTION: SYSTEMS THAT SERVE 10,000 OR MORE PEOPLE

Section 611.741 Standards for Avoiding Filtration

In addition to the requirements of Section 611.232, a PWS supplier subject to the requirements of this Subpart R that does not provide filtration must meet all of the conditions of subsections (a) and (b).

a) Site-Specific Conditions~~Site-specific conditions~~. In addition to site-specific conditions in Section 611.232, a supplier must maintain the watershed control program under Section 611.232(b) to minimize the potential for contamination by Cryptosporidium oocysts in the source water. The watershed control program must, for Cryptosporidium, do the following:

1) Identify watershed characteristics and activities that may have an adverse effect on source water quality; and

2) Monitor the occurrence of activities that may have an adverse effect on source water quality.

b) During the onsite inspection conducted under the provisions of Section 611.232(c), the Agency must determine whether the watershed control program established under Section 611.232(b) is adequate to limit potential contamination by Cryptosporidium oocysts. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of the supplier's program to monitor and control detrimental activities occurring in the watershed; and the extent to which the water supplier has maximized land ownership or controlled land use within the watershed.

BOARD NOTE: Derived from 40 CFR 141.171 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.742 Disinfection Profiling and Benchmarking

a) Determination of a Supplier Required ~~supplier required~~ to Profile ~~profile~~. A PWS supplier subject to the requirements of this Subpart R must determine its TTHM annual average using the procedure in subsection (a)(1) and its HAA5 annual average using the procedure in subsection (a)(2). The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring.

1) The TTHM annual average that is used must be the annual average during the same period as the HAA5 annual average.

A) A supplier that collected data under the provisions of 40 CFR 141 Subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under former 40 CFR 141.42 (1995).

B) A supplier that uses "grandfathered" HAA5 occurrence data that meet the provisions of subsection (a)(2)(B) must use TTHM data collected at the same time under the provisions of former Section 611.680.

C) A supplier that uses HAA5 occurrence data that meet the provisions of subsection (a)(2)(C)(i) must use TTHM data collected at the same time under the provisions of Section 611.310 and former Section 611.680.

2) The HAA5 annual average that is used must be the annual average during the same period as the TTHM annual average.

A) A supplier that collected data under the provisions of 40 CFR 141 Subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under former 40 CFR 141.42 (1995).

B) A supplier that has collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in former Section 611.680 and handling and analytical method requirements of former Section 611.685 may use that data to determine whether the requirements of this Section apply.

3) The supplier may request that the Agency approve a more representative annual data set than the data set determined under subsection (a)(1) or (a)(2) for the purpose of determining applicability of the requirements of this Section.

4) The Agency may require that a supplier use a more representative annual data set than the data set determined under subsection (a)(1) or (a)(2) for the purpose of determining the applicability of the requirements of this Section.

5) This subsection (a)(5) corresponds with 40 CFR 141.172(a)(5), an implementing provision that no longer has operative effect. This statement maintains structural consistency with the corresponding federal rules.

6) Any supplier that had either a TTHM annual average ≥ (greater than or equal to) 0.064 mg/ℓ or an HAA5 annual average ≥ 0.048 mg/ℓ during the period identified in subsections (a)(1) and (a)(2) must comply with subsection (b).

BOARD NOTE: Former Sections 611.680 and 611.685 originally derived from 40 CFR 141.30(a), (b), and (e). USEPA removed 40 CFR 141.30 in its entirety in 2006. The Board repealed former Section 611.685 in 2007 and Section 611.680 in 2012. The references to former Sections 611.680 and 611.685 in this subsection (a) relate to use of existing monitoring data collected under those provisions as they existed before their repeal.

b) Disinfection Profiling ~~profiling.~~

1) Any supplier that meets the standards in subsection (a)(6) must have developed a disinfection profile of its disinfection practice for a period of up to three years. The Agency must have determined the period of the disinfection profile, with a minimum period of one year.

2) The supplier must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}$ values in Appendix B, as appropriate, through the entire treatment plant. As a minimum, the supplier with a

single point of disinfectant application prior to entrance to the distribution system must have conducted the monitoring in subsections (b)(2)(A) through (b)(2)(D). A supplier with more than one point of disinfectant application must have conducted the monitoring in subsections (b)(2)(A) through (b)(2)(D) for each disinfection segment. The supplier must have monitored the parameters necessary to determine the total inactivation ratio, using analytical methods in Section 611.531, as follows:

A) The temperature of the disinfected water must have been measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

B) If the supplier uses chlorine, the pH of the disinfected water must have been measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

C) The disinfectant contact times ("T") must have been determined for each day during peak hourly flow.

D) The residual disinfectant concentrations ("C") of the water before or at the first customer and prior to each additional point of disinfection must have been measured each day during peak hourly flow.

3) This subsection (b)(3) corresponds with 40 CFR 141.172(b)(2)(A), a provision relating to implementation of the interim enhanced Surface Water Rule. This statement maintains structural consistency with the corresponding federal rule.

4) The supplier must calculate the total inactivation ratio as follows:

A) If the supplier uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the methods in subsection (b)(4)(A)(i) or (b)(4)(A)(ii).

i) Determine one inactivation ratio ($CT_{calc}/CT_{99.9}$) before or at the first customer during peak hourly flow.

ii) Determine successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the supplier must calculate the total inactivation ratio ($\Sigma(CT_{calc}/CT_{99.9})$) by determining $CT_{calc}/CT_{99.9}$ for each sequence and then adding the $CT_{calc}/CT_{99.9}$ values together to determine $\Sigma(CT_{calc}/CT_{99.9})$.

B) If the supplier uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The $(CT_{calc}/CT_{99.9})$ value of each segment and $(\Sigma(CT_{calc}/CT_{99.9}))$ must be calculated using the method in subsection (b)(4)(A).

C) The supplier must determine the total logs of inactivation by multiplying the value calculated in subsection (b)(4)(A) or (b)(4)(B) by 3.0.

5) A supplier that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the Agency.

6) The supplier must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the Agency for review as part of sanitary surveys conducted by the Agency.

c) Disinfection Benchmarking ~~benchmarking.~~

1) Any supplier required to develop a disinfection profile under the provisions of subsections (a) and (b) and that decides to make a significant change to its disinfection practice must consult with the Agency prior to making such change. Significant changes to disinfection practice are the following:

A) Changes to the point of disinfection;

B) Changes to the disinfectants used in the treatment plant;

C) Changes to the disinfection process; and

D) Any other modification identified by the Agency.

2) Any supplier that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in subsections (c)(2)(A) and (c)(2)(B).

A) For each year of profiling data collected and calculated under subsection (b), the supplier must determine the lowest average monthly Giardia lamblia inactivation in each year of profiling data. The supplier must determine the average Giardia lamblia inactivation for each calendar month for each year of profiling data by dividing the sum of daily Giardia lamblia of inactivation by the number of values calculated for that month.

B) The disinfection benchmark is the lowest monthly average value (for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of Giardia lamblia inactivation in each year of profiling data.

3) A supplier that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the Agency.

4) The supplier must submit information in subsections (c)(4)(A) through (c)(4)(C) to the Agency as part of its consultation process.

A) A description of the proposed change;

B) The disinfection profile for Giardia lamblia (and, if necessary, viruses) under subsection (b) and benchmark as required by subsection (c)(2); and

C) An analysis of how the proposed change will affect the current levels of disinfection.

BOARD NOTE: Derived from 40 CFR 141.172 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.743 Filtration

A PWS must provide treatment consisting of both disinfection, as specified in Section 611.242, and filtration treatment that complies with the requirements of subsection (a) or (b) or Section 611.250 (b) or (c).

a) Conventional Filtration Treatment ~~filtration treatment~~ or Direct Filtration ~~direct filtration.~~

1) For a supplier using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in Sections 611.531 and 611.533.

2) The turbidity level of representative samples of a supplier's filtered water must at no time exceed 1 NTU, measured as specified in Sections 611.531 and 611.533.

3) A supplier that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the Agency.

b) Filtration Technologies Other Than Conventional Filtration Treatment, Direct Filtration, Slow Sand Filtration, ~~technologies other than conventional filtration treatment, direct filtration, slow sand filtration,~~ or Diatomaceous Earth Filtration ~~diatomaceous earth filtration~~. A PWS supplier may use a filtration technology not listed in subsection (a) or in Section 611.250 (b) or (c) if it demonstrates to the Agency, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of Section 611.242(b), consistently achieves 99.9 percent removal or inactivation of Giardia lamblia cysts and 99.99 percent removal or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts, and the Agency approves the use of the filtration technology. For each approval, the Agency must set turbidity performance requirements that the supplier must meet at least 95 percent of the time and that the supplier must not exceed at any time at a level that consistently achieves 99.9 percent removal or inactivation of Giardia lamblia cysts, 99.99 percent removal or inactivation of viruses, and 99 percent removal of Cryptosporidium oocysts.

BOARD NOTE: Derived from 40 CFR 141.173 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.744 Filtration Sampling Requirements

a) Monitoring Requirements ~~requirements~~ for Systems Using Filtration Treatment ~~systems using filtration treatment~~. In addition to monitoring required by Sections 611.531 and 611.533, a PWS subject to the requirements of this Subpart R that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in Section 611.531(a) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every 15 minutes.

b) If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, until the turbidimeter is back online. A system must repair the equipment within a maximum of five working days after failure.

BOARD NOTE: Derived from 40 CFR 141.174 ~~(2002)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.745 Reporting and Recordkeeping Requirements

In addition to the reporting and recordkeeping requirements in Sections 611.261 and 611.262, a PWS supplier subject to the requirements of this Subpart R that provides conventional filtration treatment or direct filtration must report monthly to the Agency the information specified in subsections (a) and (b). In addition to the reporting and recordkeeping requirements in Sections 611.261 and 611.262, a PWS supplier subject to the requirements of this Subpart R that provides filtration approved under Section 611.743(b) must report monthly to the Agency the information specified in subsection (a). The reporting in subsection (a) is in lieu of the reporting specified in Section 611.262(a).

a) Turbidity measurements, as required by Section 611.743, must be reported within ten days after the end of each month the system serves water to the public. Information that must be reported is the following:

1) The total number of filtered water turbidity measurements taken during the month.

2) The number and percentage of filtered water turbidity measurements taken during the month that are less than or equal to the turbidity limits specified in Section 611.743(a) or (b).

3) The date and value of any turbidity measurements taken during the month that exceed 1 NTU for a supplier using conventional filtration treatment or direct filtration, or that exceed the maximum level under Section 611.743(b).

b) A supplier must maintain the results of individual filter monitoring taken under Section 611.744 for at least three years. A supplier must report that it has conducted individual filter turbidity monitoring under Section 611.744 within ten days after the end of each month the system serves water to the public. A supplier must report individual filter turbidity measurement results taken under Section 611.744 within ten days after the end of each month the supplier serves water to the public only if measurements demonstrate one or more of the conditions in subsections (b)(1) through (b)(4). A supplier that uses lime softening may apply to the Agency for alternative exceedance levels for the levels specified in subsections (b)(1) through (b)(4) if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

1) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the supplier must report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the supplier must either produce a filter profile for the filter within seven days after the exceedance (if the supplier is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

2) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the supplier must report the filter number, the turbidity, and the dates on which the exceedance

occurred. In addition, the supplier must either produce a filter profile for the filter within seven days after the exceedance (if the supplier is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

3) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of three consecutive months, the supplier must report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the supplier must conduct a self-assessment of the filter within 14 days after the exceedance and report that the self-assessment was conducted. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

4) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each of two consecutive months, the supplier must report the filter number, the turbidity measurement, and the dates on which the exceedance occurred. In addition, the supplier must arrange for the conduct of a comprehensive performance evaluation by the Agency or a third party approved by the Agency no later than 30 days following the exceedance and have the evaluation completed and submitted to the Agency no later than 90 days following the exceedance.

c) Additional Reporting Requirements ~~reporting requirements.~~

1) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the supplier must consult with the Agency as soon as possible, but no later than the end of the next business day.

2) If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the Agency under Section 611.743(b) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the supplier must inform the Agency as soon as possible, but no later than the end of the next business day.

BOARD NOTE: Derived from 40 CFR 141.175 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART S: GROUNDWATER RULE

Section 611.800 General Requirements and Applicability

a) Scope of This ~~this~~ Subpart S. The requirements of this Subpart S constitute NPDWRs.

b) Applicability. This Subpart S applies to all PWS suppliers that use groundwater, except that it does not apply to public water systems that combine all of their groundwater with surface water or with groundwater under the direct influence of surface water prior to treatment under Subpart B. For the purposes of this Subpart S, "GWS" is defined as any PWS that meets this applicability statement, including a consecutive system receiving finished groundwater.

c) General Requirements ~~requirements~~. A supplier subject to this Subpart S must comply with the following requirements:

1) Sanitary survey information requirements for all GWS suppliers, as described in Section 611.801.

2) Microbial source water monitoring requirements for GWS suppliers that do not treat all of their groundwater to at least 99.99 percent (4-log) treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer, as described in Section 611.802.

3) Treatment technique requirements, described in Section 611.803, that apply to GWS suppliers that have fecally contaminated source waters, as determined by source water monitoring conducted under Section 611.802, or which have significant deficiencies that are identified by the Agency, by a SEP, or which are identified by USEPA under SDWA section 1445 (42 USC 300j-4). A GWS supplier with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this Subpart S must implement one or more of the following corrective action options: correct all significant deficiencies; provide an alternate source of water; eliminate the source of contamination; or provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer.

4) A GWS supplier that provides at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer is required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in Section 611.803(b).

5) If requested by the Agency, a GWS supplier must provide the Agency with any existing information that will enable the Agency to perform a hydrogeologic sensitivity assessment.

BOARD NOTE: The Board moved the definition of "hydrogeologic sensitivity assessment" to the definitions provision of this Part: Section 611.101.

d) This subsection (d) corresponds with 40 CFR 141.400(d), which recites past effective dates. This statement maintains structural consistency with the corresponding federal provision.

BOARD NOTE: Derived from 40 CFR 141.400~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.801 Sanitary Surveys for GWS Suppliers

a) A GWS supplier must provide the Agency, at the Agency's request, any existing information that will enable the Agency to conduct a sanitary survey.

b) For the purposes of this Subpart S, a "sanitary survey~~,~~", as conducted by the Agency, includes an onsite review of the delineated WHPAs (identifying sources of contamination within the WHPAs and evaluations of the hydrogeologic sensitivity of the delineated WHPAs conducted under source water assessments or utilizing other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

c) The sanitary survey must include an evaluation of the applicable components listed in subsections (c)(1) through (c)(8):

1) Source;

2) Treatment;

3) Distribution system;

4) Finished water storage;

5) Pumps, pump facilities, and controls;

6) Monitoring, reporting, and data verification;

7) System management and operation; and

8) Operator compliance with Agency requirements.

d) The Agency must repeat the sanitary survey as follows:

1) The Agency must conduct a sanitary survey that addresses the eight sanitary survey components listed in subsection (c) no less frequently than every three years for a CWS supplier, except as provided in subsection (d)(3), and every five years for a non-CWS supplier. The Agency may conduct more frequent sanitary surveys for any supplier. The sanitary survey must include an evaluation of each of the elements set forth in subsection (c), as applicable.

2) The Agency may use a phased review process to meet the requirements of subsection (d)(1) if all the applicable elements of subsection (c) are evaluated within the required interval.

3) The Agency may conduct sanitary surveys once every five years for community water systems under any of the following circumstances:

A) If the system either provides at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log inactivation and removal) before or at the first customer for all its groundwater sources; or

B) If the supplier has an outstanding performance record, as determined by the Agency and documented in previous sanitary surveys, and the supplier had no history of total coliform MCL or monitoring violations under former Sections 611.521 through 611.527 since the last sanitary survey.

4) This subsection (d)(4) corresponds with 40 CFR 142.16(o)(2)(iv), which imposes requirements for describing the elements of the State's regulatory system. This statement maintains structural consistency with the corresponding federal provision.

5) The Agency must provide a GWS supplier with written notice by a SEP that describes any significant deficiency which it has found no later than 30 days after the Agency has identified the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. The Agency may provide the written notice at the time of the sanitary survey.

BOARD NOTE: Subsections (a) through (c) are derived from 40 CFR 141.401~~ (2016)~~. Subsection (d) is derived from 40 CFR 142.16(o)(2)~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.802 Groundwater Source Microbial Monitoring and Analytical Methods

a) Triggered Source Water Monitoring~~ source water monitoring.~~

1) General Requirements ~~requirements~~. A GWS supplier must conduct triggered source water monitoring if the following conditions exist.

A) The supplier does not provide at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for each groundwater source.

B) This subsection (a)(1)(B) corresponds with 40 CFR 141.802(a)(1)(ii), which has no operative effect after a past implementation date. This statement maintains structural consistency with the federal regulations.

C) The system is notified that a sample collected under Sections 611.1054 through 611.1057 is total coliform-positive and the sample is not invalidated under Section 611.1053(c).

2) Sampling Requirements ~~requirements~~. A GWS supplier must collect, within 24 hours after notification of the total coliform-positive sample, at least one groundwater source sample from each groundwater source in use at the time the total coliform-positive sample was collected under ~~pursuant to~~ Sections 611.1054 through 611.1057, except as provided in subsection (a)(2)(B).

A) The Agency may, by a SEP, extend the 24-hour time limit on a case-by-case basis if it determines that the supplier cannot collect the groundwater source water sample within 24 hours due to circumstances beyond the supplier's control. In the case of an extension, the Agency must specify how much time the supplier has to collect the sample.

B) If approved by the Agency, a supplier with more than one groundwater source may meet the requirements of this subsection (a)(2) by sampling a representative groundwater source or sources. If directed by the Agency by a SEP, the supplier must submit for Agency approval a triggered source water monitoring plan that identifies one or more groundwater sources that are representative of each monitoring site in the system's sample siting plan under Section 611.1053 ~~611.521~~ and that the system intends to use for representative sampling under ~~pursuant to~~ this subsection (a).

C) This subsection (a)(2)(C) corresponds with 40 CFR 141.802(a)(1)(ii), a now-obsolete implementing provision. This statement maintains structural consistency with the federal regulations.

D) A GWS supplier that serves 1,000 or fewer people may use a repeat sample collected from a groundwater source to meet both the requirements of Subpart AA and to satisfy the monitoring requirements of subsection (a)(2) for that groundwater source only if the Agency, by a SEP, approves the use of E. coli as a fecal indicator for source water monitoring under this subsection (a) and approves the use of a single sample for meeting both the triggered source water monitoring requirements in this subsection (a) and the repeat monitoring requirements in Section 611.1058. If the repeat sample collected from the groundwater source is E. coli-positive, the system must comply with subsection (a)(3).

3) Additional Requirements ~~requirements~~. If the Agency does not require corrective action under Section 611.803(a)(2) for a fecal indicator-positive source water sample collected under subsection (a)(2) that is not invalidated under subsection (d), the system must collect five additional source water samples from the same source within 24 hours after being notified of the fecal indicator-positive sample.

4) Consecutive and Wholesale Systems ~~wholesale systems.~~

   A) In addition to the other requirements of this subsection (a), a consecutive GWS supplier that has a total coliform-positive sample collected under Sections 611.1054 through 611.1057, must notify the wholesale systems within 24 hours after being notified of the total coliform-positive sample.

   B) In addition to the other requirements of this subsection (a), a wholesale GWS supplier must comply with the following requirements:

      i) A wholesale GWS supplier that receives notice from a consecutive system it serves that a sample collected under Sections 611.1054 through 611.1057, is total coliform-positive must, within 24 hours after being notified, collect a sample from its groundwater sources under subsection (a)(2) and analyze it for a fecal indicator under subsection (c).

      ii) If the sample collected under subsection (a)(4)(B)(i) is fecal indicator-positive, the wholesale GWS supplier must notify all consecutive systems served by that groundwater source of the fecal indicator source water positive within 24 hours after being notified of the groundwater source sample monitoring result and must meet the requirements of subsection (a)(3).

5) Exceptions to the Triggered Source Water Monitoring Requirements ~~triggered source water monitoring requirements~~. A GWS supplier is not

required to comply with the source water monitoring requirements of subsection (a) if either of the following conditions exists:

A) The Agency determines, and documents in writing, by a SEP, that the total coliform-positive sample collected under Sections 611.1054 through 611.1057, is caused by a distribution system deficiency; or

B) The total coliform-positive sample collected under Sections 611.1054 through 611.1057, is collected at a location that meets Agency criteria for distribution system conditions that will cause total coliform-positive samples.

b) Assessment Source Water Monitoring ~~source water monitoring~~. If directed by the Agency by a SEP, a GWS supplier must conduct assessment source water monitoring that meets Agency-determined requirements for such monitoring. A GWS supplier conducting assessment source water monitoring may use a triggered source water sample collected under subsection (a)(2) to meet the requirements of subsection (b). Agency-determined assessment source water monitoring requirements may include the following:

1) Collection of a total of 12 groundwater source samples that represent each month the system provides groundwater to the public;

2) Collection of samples from each well, unless the system obtains written Agency approval to conduct monitoring at one or more wells within the GWS that are representative of multiple wells used by that system and which draw water from the same hydrogeologic setting;

3) Collection of a standard sample volume of at least 100 mℓ for fecal indicator analysis, regardless of the fecal indicator or analytical method used;

4) Analysis of all groundwater source samples using one of the analytical methods listed in subsection (c)(2) for the presence of E. coli, enterococci, or coliphage;

5) Collection of groundwater source samples at a location prior to any treatment of the groundwater source unless the Agency approves a sampling location after treatment; and

6) Collection of groundwater source samples at the well itself, unless the system's configuration does not allow for sampling at the well itself and the Agency approves an alternate sampling location by a SEP that is representative of the water quality of that well.

c) Analytical Methods ~~methods.~~

1) A GWS supplier subject to the source water monitoring requirements of subsection (a) must collect a standard sample volume of at least 100 mℓ for fecal indicator analysis, regardless of the fecal indicator or analytical method used.

2) A GWS supplier must analyze all groundwater source samples collected under subsection (a) using one of the analytical methods listed in subsections (c)(2)(A) through (c)(2)(C), each incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480, subject to the limitations of subsection (c)(2)(D), for the presence of E. coli, enterococci, or coliphage:

A) E. coli. Enzyme Substrate Technique~~:~~

i) Colilert®.~~ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method ~~9223 B (97), SM 9223 B (04), or SM 9223 B (16).

ii) Colisure®.~~™ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method ~~9223 B (97), SM 9223 B (04), or SM 9223 B (16).

iii) Membrane Filter Method with MI Agar.~~:~~ USEPA ~~Method~~ 1604 (02).

~~iv) m-ColiBlue24 Test.~~

iv) E*Colite (98)~~ Test~~.

v~~i~~) EC–MUG.~~:~~ SM ~~Standard Methods, 20th or 22nd ed., Method ~~9221 F (94), SM 9221 F (06), or SM 9221 F (14).

vi~~i~~) NA–MUG.~~:~~ SM ~~Standard Methods, 20th ed., Method ~~9222 G (97) (20th ed. only) or SM 9222 I (15);~~.~~

vii~~i~~) Colilert®-18.~~ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method ~~9223 B (97), SM 9223 B (04), or SM 9223 B (16);~~.~~

viii~~x~~) Readycult® (07)~~ 2007~~.

ix) Modified Colitag™ (09)~~ Test~~.

x~~i~~) Chromocult® (00)~~ Method~~.

xi~~i~~) Tecta (14) or Tecta (17)~~ EC/TC P-A Test, ver. 1.0 or 2.0~~.

BOARD NOTE: EC–MUG (SM ~~Standard Methods, Method ~~9221

F (94) (20th ed. only)) or NA–MUG (SM ~~Standard Methods, Method~~ 9222 G (97) (20th ed. only)), both incorporated by reference in Section 611.102, can be used for E. coli testing step, as described in 40 CFR 141.21(f)(6)(i) or (f)(6)(ii), incorporated by reference in Section 611.102, ~~Section 611.526(f)(1) or (f)(2)~~ after use of SM ~~Standard Methods, 20th ed., Method~~ 9221 B (93), SM 9221 B (94), SM 9221 B (99), SM 9221 B (06), SM 9221 D (93), SM 9221 D (94), SM 9221 D (99), SM 9221 D (06), SM 9222 B (91), SM 9222 B (94), SM 9222 B (97), SM 9222 C (91), SM 9222 C (94), or SM 9222 C (97). ~~USEPA added Standard Methods, 21st ed., Method 9223 B as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Readycult® 2007, Modified Colitag™ Test, and Chromocult® Method as approved alternative methods on June 8, 2010 (at 75 Fed. Reg. 32295). USEPA added Standard Methods, 22nd ed., Methods 9221 F and 9223 B as approved alternative methods on May 31, 2013 (at 78 Fed. Reg. 32558). USEPA added Standard Methods Online, Method 9221 F-06 and 9223 B-04 and Tecta EC/TC P-A Test, ver. 1.0 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added Tecta EC/TC P-A Test, ver. 2.0 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Methods 9223 B and 9221 F are the same versions as Standard Methods Online, Methods 9223 B-04 and 9221 F-06, the Board has not listed the Standard Methods Online versions separately.~~

B) E. coli. Fermentation Technique

i) Hach 10029 (99) (m-ColiBlue24®).

ii) SM 9222 J (15).

C~~B~~) Enterococci~~:~~

i) Multiple-Tube Technique.~~:~~ SM ~~Standard Methods, 20th ed., Method~~ 9230 B (93) (20th ed. only), SM 9230 B~~ or~~ (~~Standard Methods Online, Method 9230 B-~~04), SM 9230 C (93) (20th ed. only), SM 9230 C (13), or USEPA 1600 (02).

BOARD NOTE: The holding time and temperature for groundwater samples are specified in subsection (c)(2)(D), rather than as specified in Section 8 of USEPA ~~Method~~ 1600 (02).

~~ii) Membrane Filter Technique: Standard Methods, 20th ed., Method 9230 C, and USEPA Method 1600.~~

ii~~i~~) Fluorogenic Substrate Enterococcus Test (using Enterolert). Enterolert (96) or SM 9230 D (13).

BOARD NOTE: Medium is available through IDEXX Laboratories, Inc., at the address set forth in Section 611.102(b). Preparation and use of the medium must be as set forth in the article that embodies the method as incorporated by reference in Section 611.102(b).

~~BOARD NOTE: USEPA added Standard Methods Online, Method 9230 B-04 as an approved alternative method on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D~~C~~) Coliphage~~:~~

i) Two-Step Enrichment Presence-Absence Procedure.~~:~~ USEPA ~~Method~~ 1601 (01) or Charm Fast Phage (12).

ii) Single Agar Layer Procedure.~~:~~ USEPA ~~Method~~ 1602 (01).

E~~D~~) Limitation on Methods Use ~~methods use~~. The time from sample collection to initiation of analysis may not exceed 30 hours. The GWS supplier is encouraged but is not required to hold samples below 10° C ~~10°C~~ during transit.

d) Invalidation of a Fecal Indicator-Positive Groundwater Source Sample ~~fecal indicator-positive groundwater source sample.~~

1) A GWS supplier may obtain Agency invalidation of a fecal indicator-positive groundwater source sample collected under subsection (a) only under either of the following conditions:

A) The supplier provides the Agency with written notice from the laboratory that improper sample analysis occurred; or

B) The Agency determines and documents in writing by a SEP that there is substantial evidence that a fecal indicator-positive groundwater source sample is not related to source water quality.

2) If the Agency invalidates a fecal indicator-positive groundwater source sample, the GWS supplier must collect another source water sample under subsection (a) within 24 hours after being notified by the Agency of its invalidation decision, and the supplier must have it analyzed for the same fecal indicator using the analytical methods in subsection (c). The Agency may extend the 24-hour time limit on a case-by-case basis if the supplier cannot collect the source water sample within 24 hours due to circumstances beyond its control. In the case of an extension, the Agency must specify how much time the system has to collect the sample.

e) Sampling Location ~~location.~~

1) Any groundwater source sample required under subsection (a) must be collected at a location prior to any treatment of the groundwater source unless the Agency approves a sampling location after treatment.

2) If the supplier's system configuration does not allow for sampling at the well itself, it may collect a sample at an Agency-approved location to meet the requirements of subsection (a) if the sample is representative of the water quality of that well.

f) New Sources ~~sources~~. If directed by the Agency by a SEP, a GWS supplier that places a new groundwater source into service must conduct assessment source water monitoring under subsection (b). If directed by the SEP, the system must begin monitoring before the groundwater source is used to provide water to the public.

g) Public Notification. A GWS supplier with a groundwater source sample collected under subsection (a) or (b) that is fecal indicator-positive and which is not invalidated under subsection (d), including a consecutive system supplier served by the groundwater source, must conduct public notification under ~~pursuant to~~ Section 611.902.

h) Monitoring Violations. A failure to meet the requirements of subsections (a) through (f) is a monitoring violation that requires the GWS supplier to provide public notification under Section 611.904.

BOARD NOTE: Derived from 40 CFR 141.402 and appendix A to subpart C of 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Method 9221 F-06 appears in the 22nd edition as Method 9221 F. In this Section, this appears as SM 9221 F (06).

Standard Methods Online, Method 9222 G-97 appears in the 20th and 21st editions as Method 9222 G. In this Section, this appears as SM 9222 G (97).

Standard Methods Online, Method 9223 B-97 appears in the 20th and 21st editions as Method 9223 B. In this Section, this appears as SM 9223 B (97).

Standard Methods Online, Method 9223 B-04 appears in the 22nd edition as Method 9223 B. In this Section, this appears as SM 9223 B (04).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.803 Treatment Technique Requirements for GWS Suppliers

a) GWS Suppliers ~~suppliers~~ with Significant Deficiencies ~~significant deficiencies~~ or Source Water Fecal Contamination ~~source water fecal contamination.~~

1) The treatment technique requirements of this Section must be met by GWS suppliers when a significant deficiency is identified or when a groundwater source sample collected under Section 611.802(a)(3) is fecal indicator-positive.

2) If directed by the Agency by a SEP, a GWS supplier with a groundwater source sample collected under Section 611.802(a)(2), (a)(4), or (b) that is fecal indicator-positive must comply with the treatment technique requirements of this Section.

3) When a significant deficiency is identified at a Subpart B PWS that uses both groundwater and surface water or groundwater under the direct influence of surface water, the system must comply with provisions of this subsection (a) except in cases where the Agency determines that the significant deficiency is in a portion of the distribution system that is served solely by surface water or groundwater under the direct influence of surface water.

4) Unless the Agency, by a SEP, directs the GWS supplier to implement a specific corrective action, the GWS supplier must consult with the Agency regarding the appropriate corrective action within 30 days after receiving written notice from the Agency of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under Section 611.802(a)(3) was found to be fecal indicator-positive, or direction from the Agency that a fecal indicator-positive collected under Section 611.802(a)(2), (a)(4), or (b) requires corrective action. For the purposes of this Subpart S, significant deficiencies include defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the Agency determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

5) Within 120 days (or earlier if directed by the Agency) after receiving written notification from the Agency of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under Section 611.802(a)(3) was found to be fecal indicator-positive, or written notice from the Agency that a fecal indicator-positive sample collected under Section 611.802(a)(2), (a)(4), or (b) requires corrective action, the GWS supplier must do either of the following:

A) It must have completed corrective action in accordance with any applicable plan review processes adopted by the Agency or with any SEP issued by the Agency, if any, including Agency-specified interim measures; or

B) It must be in compliance with an Agency-approved corrective action plan and schedule, subject to the following conditions:

i) Any subsequent modifications to an Agency-approved corrective action plan and schedule must also be approved by the Agency; and

ii) If the Agency specifies interim measures for protection of the public health pending Agency approval of the corrective action plan and schedule or pending completion of the corrective action plan, the supplier must comply with those interim measures, as well as with any schedule specified by the Agency.

6) Corrective Action Alternatives ~~action alternatives~~. A GWS supplier that meets the conditions of subsection (a)(1) or (a)(2) must implement one or more of the following corrective action alternatives:

A) It must correct all significant deficiencies;

B) It must provide an alternate source of water;

C) It must eliminate the source of contamination; or

D) It must provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

7) Special Notice ~~notice~~ to the Public ~~public~~ of Significant Deficiencies ~~significant deficiencies~~ or Source Water Fecal Contamination ~~source water fecal contamination.~~

A) In addition to the applicable public notification requirements of Section 611.902, a community GWS supplier that receives notice from the Agency of a significant deficiency or notification of a fecal indicator-positive groundwater source sample that is not invalidated by the Agency under Section 611.802(d) must inform the public served by the water system under Section 611.883(h)(6) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The supplier must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the groundwater source is determined by the Agency to be corrected under subsection (a)(5).

B) In addition to the applicable public notification requirements of Section 611.902, a non-community GWS supplier that receives notice from the Agency of a significant deficiency must inform the public served by the water system in a manner approved by the Agency of any significant deficiency that has not been corrected within 12 months after being notified by the Agency, or earlier if directed by the Agency. The supplier must continue to inform the public annually until the significant deficiency is corrected. The information must include the following information:

i) The nature of the significant deficiency and the date the significant deficiency was identified by the Agency;

ii) The Agency-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

iii) For a supplier with a large proportion of non-English speaking consumers, as determined by the Agency, information in the appropriate languages regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

C) If directed by the Agency, a non-CWS supplier with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under subsection (a)(7)(B).

b) Compliance Monitoring ~~monitoring.~~

1) Existing groundwater sources. A GWS supplier that is not required by Section 611.802(a)(1) to meet the source water monitoring requirements of this Subpart S for any groundwater source must notify the Agency in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for the specified groundwater source and begin compliance monitoring in accordance with subsection (b)(3). Notification to the Agency must include engineering, operational, or other information that the Agency requests to evaluate the submission. If the supplier subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source, the supplier must conduct groundwater source monitoring, as required under Section 611.802.

2) New Groundwater Sources ~~groundwater sources~~. A GWS supplier that places a groundwater source in service which is not required by Section 611.802(a)(1) to meet the source water monitoring requirements of this Subpart S must comply with the requirements of subsections (b)(2)(A), (b)(2)(B), and (b)(2)(C).

A) The supplier must notify the Agency in writing that it provides at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source. Notification to the Agency must include engineering, operational, or other information that the Agency requests by a SEP to evaluate the submission.

B) The supplier must conduct compliance monitoring, as required under Section 611.803(b)(3), within 30 days after placing the source in service.

C) The supplier must conduct groundwater source monitoring under Section 611.802 if it subsequently discontinues 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for the groundwater source.

3) Monitoring Requirements ~~requirements~~. A GWS supplier subject to the requirements of subsection (a), (b)(1), or (b)(2) must monitor the effectiveness and reliability of treatment for that groundwater source before or at the first customer as follows:

A) Chemical Disinfection ~~disinfection.~~

i) GWS Suppliers Serving More Than ~~suppliers serving more than~~ 3,300 People ~~people~~. A GWS supplier that serves more than 3,300 people must continuously monitor the residual disinfectant concentration using analytical methods specified in Section 611.531(b) at a location approved by the Agency and must record the lowest residual disinfectant concentration each day that water from the groundwater source is served to the public. The GWS supplier must maintain the Agency-approved residual disinfectant concentration every day it serves water from the groundwater source to the public. If there is a failure in the continuous monitoring equipment, the GWS supplier must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The supplier must resume continuous residual disinfectant monitoring within 14 days.

ii) GWS Suppliers Serving ~~suppliers serving~~ 3,300 or Fewer People ~~fewer people~~. A GWS supplier that serves 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in Section 611.531(b) at a location approved by the Agency and record the residual disinfection concentration each day that water from the groundwater source is served to the public. The GWS supplier must determine and maintain the Agency-approved residual disinfectant concentration every day that it serves water from the groundwater source to the public. The GWS supplier must take a daily grab sample during the hour of peak flow or at another time specified by the Agency. If any daily grab sample measurement falls below the Agency-approved residual disinfectant concentration, the GWS supplier must take follow-up samples every four hours until the residual disinfectant concentration is restored to the Agency-approved level. Alternatively, a GWS supplier that serves 3,300 or fewer people may monitor continuously and meet the requirements of subsection (b)(3)(A)(i).

B) Membrane Filtration ~~filtration~~. A GWS supplier that uses membrane filtration to meet the requirements of this Subpart S must monitor the membrane filtration process in accordance with all Agency-specified monitoring requirements and must operate the membrane filtration in accordance with all Agency-specified compliance requirements. A GWS supplier that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when it fulfills the following conditions:

i) The membrane has an absolute molecular weight cut-off, or an alternative parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

ii) The membrane process is operated in accordance with Agency-specified compliance requirements; and

iii) The integrity of the membrane is intact.

C) Alternative Treatment ~~treatment~~. A GWS supplier that uses an Agency-approved alternative treatment to meet the requirements of this Subpart S by providing at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer must do both of the following:

i) It must monitor the alternative treatment in accordance with all Agency-specified monitoring requirements; and

ii) It must operate the alternative treatment in accordance with all operational requirements determined by the supplier that the Agency has approved as necessary to achieve at least 4-log treatment of viruses.

c) Discontinuing Treatment ~~treatment~~. A GWS supplier may discontinue 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source if the supplier determines and documents and the Agency approves in writing that 4-log treatment of viruses is no longer necessary for that groundwater source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of Section 611.802 of this Subpart S.

d) A failure to meet the monitoring requirements of subsection (b) is a monitoring violation and requires the GWS supplier to provide public notification under Section 611.904.

BOARD NOTE: Derived from 40 CFR 141.403 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.804 Treatment Technique Violations for GWS Suppliers

a) A GWS supplier with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Agency by a SEP) after ~~of~~ receiving written notice from the Agency of the significant deficiency, the system does not do either of the following:

1) It does not complete corrective action in accordance with any applicable Agency plan review processes or other Agency guidance and direction, including Agency specified interim actions and measures; or

2) It is not in compliance with an Agency-approved corrective action plan and schedule.

b) Unless the Agency invalidates a fecal indicator-positive groundwater source sample under Section 611.802(d), a GWS supplier is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the Agency) after meeting the conditions of Section 611.803(a)(1) or (a)(2), the supplier does not do either of the following:

1) It does not complete corrective action in accordance with any applicable Agency plan review processes or other Agency guidance and direction, including Agency-specified interim measures; or

2) It is not in compliance with an Agency-approved corrective action plan and schedule.

c) A GWS supplier subject to the requirements of Section 611.803(b)(3) that fails to maintain at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer for a groundwater source is in violation of the treatment technique requirement if the failure is not corrected within four hours after determining the supplier is not maintaining at least 4-log treatment of viruses before or at the first customer.

d) A GWS supplier must give public notification under Section 611.903 for the treatment technique violations specified in subsections (a), (b), and (c).

BOARD NOTE: Derived from 40 CFR 141.404 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART U: CONSUMER CONFIDENCE REPORTS

Section 611.883 Content of the Reports

a) Each CWS must provide to its customers an annual report that contains the information specified in this Section and Section 611.884.

b) Information on the Source ~~source~~ of the Water Delivered ~~water delivered.~~

1) Each report must identify the sources of the water delivered by the CWS by providing information on the following:

A) The type of the water (e.g., surface water, groundwater); and

B) The commonly used name (if any) and location of the body (or bodies) of water.

2) If a source water assessment has been completed, the report must notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the Agency, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the Agency or written by the supplier.

c) Definitions~~.~~

1) Each report must include the following definitions:

A) Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

BOARD NOTE: Although an MCLG is not an NPDWR that the Board must include in the Illinois SDWA regulations, the use of this definition is mandatory where the term "MCLG" is defined.

B) Maximum Contaminant Level or MCL: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

2) A report for a CWS operating under relief from an NPDWR issued under Section 611.111, 611.112, 611.130, or 611.131 must include the following definition: "Variances, Adjusted Standards, and Site-specific Rules: State permission not to meet an MCL or a treatment technique under certain conditions."

3) A report that contains data on contaminants that USEPA regulates using any of the following terms must include the applicable definitions:

A) Treatment technique: A required process intended to reduce the level of a contaminant in drinking water.

B) Action level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

C) Maximum residual disinfectant level goal or MRDLG: The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

BOARD NOTE: Although an MRDLG is not an NPDWR that the Board must include in the Illinois SDWA regulations, the use of this definition is mandatory where the term "MRDLG" is defined.

D) Maximum residual disinfectant level or MRDL: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

4) A report that contains information regarding a Level 1 or Level 2 assessment required under Subpart AA must include the applicable of the following definitions:

A) "Level 1 assessment: A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system."

B) "Level 2 assessment: A Level 2 assessment is a very detailed study of the water system to identify potential problems and determine (if possible) why an E. coli MCL violation has occurred or why total coliform bacteria have been found in our water system on multiple occasions."

d) Information on Detected Contaminants ~~detected contaminants.~~

1) This subsection (d) specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except Cryptosporidium). It applies to the following:

A) Contaminants subject to an MCL, action level, MRDL, or treatment technique (regulated contaminants);

B) Contaminants for which monitoring is required by USEPA under 40 CFR 141.40 (unregulated contaminants); and

C) Disinfection byproducts or microbial contaminants for which monitoring is required by Section 611.382 and Subpart L, except as provided under subsection (e)(1), and which are detected in the finished water.

2) The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results that a CWS chooses to include in its report must be displayed separately.

3) The data must have been derived from data collected to comply with monitoring and analytical requirements during calendar year 1998 for the first report and must be derived from the data collected in subsequent calendar years, except that the following requirements also apply:

A) Where a system is allowed to monitor for regulated contaminants less often than once a year, the tables must include the date and results of the most recent sampling, and the report must include a brief statement indicating that the data presented in the report is from the most recent testing done in accordance with the regulations. No data older than five years need be included.

B) Results of monitoring in compliance with Section 611.382 and Subpart L need only be included for five years from the date of last sample or until any of the detected contaminants becomes regulated and subject to routine monitoring requirements, whichever comes first.

4) For detected regulated contaminants (listed in Appendix A), the tables must contain the following:

   A) The MCL for that contaminant expressed as a number equal to or greater than 1.0 (as provided in Appendix A);

   B) The federal Maximum Contaminant Level Goal (MCLG) for that contaminant expressed in the same units as the MCL;

   C) If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definitions for treatment technique or action level, as appropriate, specified in subsection (c)(3);

   D) For contaminants subject to an MCL, except turbidity, total coliforms, fecal coliforms, and E. coli, the highest contaminant level used to determine compliance with an NPDWR, and the range of detected levels, as follows:

      i) When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL.

      ii) When compliance with the MCL is determined by calculating a running annual average of all samples taken at a monitoring location: the highest average of any of the monitoring locations and the range of all monitoring locations expressed in the same units as the MCL. For the MCLs for TTHM and HAA5 in Section 611.312(b)(2), the supplier must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If results from more than one location exceed the TTHM or HAA5 MCL, the supplier must include the locational running annual average for each location whose results exceed the MCL.

      iii) When compliance with the MCL is determined on a system-wide basis by calculating a running annual average of all samples at all monitoring locations: the average and range of detection expressed in the same units as the MCL. The supplier is required to include individual sample results for the IDSE conducted under Subpart W when determining the range of TTHM and HAA5 results to be reported in the annual consumer confidence report for the calendar year that the IDSE samples were taken.

BOARD NOTE to subsection (d)(4)(D): When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix A; derived from 40 CFR 153 ~~(2016)~~.

E) For turbidity, the following:

i) When it is reported under Section 611.560: the highest average monthly value.

ii) When it is reported under the requirements of Section 611.211(b): the highest monthly value. The report must include an explanation of the reasons for measuring turbidity.

iii) When it is reported under Section 611.250, 611.743, or 611.955(b): the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in Section 611.250, 611.743, or 611.955(b) for the filtration technology being used. The report must include an explanation of the reasons for measuring turbidity;

F) For lead and copper, the following: the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level;

G) This subsection (d)(4)(G) corresponds with 40 CFR 141.153(d)(4)(vii), which has no operative effect after a past implementation date. This statement maintains structural consistency with the federal regulations.

H) This subsection (d)(4)(H) corresponds with 40 CFR 141.153(d)(4)(viii), a now-obsolete implementing provision. This statement maintains structural consistency with the federal regulations.

I) The likely sources of detected contaminants to the best of the supplier's knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and must be used when available to the supplier. If the supplier lacks specific information on the likely source, the report must include one or more of the typical sources for that contaminant listed in Appendix G that are most applicable to the CWS; and

J) For E. coli analytical results under Subpart AA, the total number of positive samples.

5) If a CWS distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table must contain a separate column for each service area and the report must identify each separate distribution system. Alternatively, a CWS may produce separate reports tailored to include data for each service area.

6) The tables must clearly identify any data indicating violations of MCLs, MRDLs, or treatment techniques, and the report must contain a clear and readily understandable explanation of the violation including the following: the length of the violation, the potential adverse health effects, and actions taken by the CWS to address the violation. To describe the potential health effects, the CWS must use the relevant language of Appendix A.

7) For detected unregulated contaminants for which monitoring is required by USEPA under 40 CFR 141.40 (except Cryptosporidium), the tables must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

e) Information on Cryptosporidium, radon, and other contaminants, as follows:

1) If the CWS has performed any monitoring for Cryptosporidium, including monitoring performed to satisfy the requirements of Subpart L, that indicates that Cryptosporidium may be present in the source water or the finished water, the report must include the following:

A) A summary of the results of the monitoring; and

B) An explanation of the significance of the results.

2) If the CWS has performed any monitoring for radon that indicates that radon may be present in the finished water, the report must include the following:

A) The results of the monitoring; and

B) An explanation of the significance of the results.

3) If the CWS has performed additional monitoring that indicates the presence of other contaminants in the finished water, the report must include the following:

A) The results of the monitoring; and

B) An explanation of the significance of the results noting the existence of any health advisory or proposed regulation.

f) Compliance with an NPDWR. In addition to the requirements of subsection (d)(6), the report must note any violation that occurred during the year covered by the report of a requirement listed below, and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the CWS has taken to correct the violation.

1) Monitoring and reporting of compliance data.

2) Filtration and Disinfection Prescribed ~~disinfection prescribed~~ by Subpart B. For CWSs that have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes that constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

3) Lead and Copper Control Requirements Prescribed ~~copper control requirements prescribed~~ by Subpart G. For systems that fail to take one or more actions prescribed by Section 611.350(d), 611.351, 611.352, 611.353, or 611.354, the report must include the applicable language of Appendix A for lead, copper, or both.

4) Treatment Techniques ~~techniques~~ for Acrylamide ~~acrylamide~~ and Epichlorohydrin Prescribed ~~epichlorohydrin prescribed~~ by Section 611.296. For systems that violate the requirements of Section 611.296, the report must include the relevant language from Appendix A.

5) Recordkeeping of compliance data.

6) Special monitoring requirements prescribed by Section 611.630.

7) Violation of the terms of a variance, adjusted standard, site-specific rule, or administrative or judicial order.

g) Variances, Adjusted Standards, ~~adjusted standards,~~ and Site-Specific Rules ~~site-specific rules~~. If a system is operating under the terms of a variance, adjusted standard, or site-specific rule issued under Section 611.111, 611.112, or 611.131, the report must contain the following:

1) An explanation of the reasons for the variance, adjusted standard, or site-specific rule;

2) The date on which the variance, adjusted standard, or site-specific rule was issued;

3) A brief status report on the steps the CWS is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and

schedules of the variance, adjusted standard, or site-specific rule; and

4) A notice of any opportunity for public input in the review, or renewal, of the variance, adjusted standard, or site-specific rule.

h) Additional Information ~~information.~~

1) The report must contain a brief explanation regarding contaminants that may reasonably be expected to be found in drinking water, including bottled water. This explanation may include the language of subsections (h)(1)(A) through (h)(1)(C) or CWSs may use their own comparable language. The report also must include the language of subsection (h)(1)(D).

A) The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

B) Contaminants that may be present in source water include the following:

i) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife;

ii) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming;

iii) Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

iv) Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and

v) Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

C) In order to ensure that tap water is safe to drink, USEPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. United States Food and Drug Administration (USFDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

D) Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA Safe Drinking Water Hotline (800-426-4791).

2) The report must include the telephone number of the owner, operator, or designee of the CWS as a source of additional information concerning the report.

3) In communities with a large proportion of non-English speaking residents, as determined by the Agency, the report must contain information in the appropriate languages regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

4) The report must include information about opportunities for public participation in decisions that may affect the quality of the water.

5) The CWS may include such additional information as it deems necessary for public education consistent with, and not detracting from, the purpose of the report.

6) Suppliers Required ~~required~~ to Comply ~~comply~~ with Subpart S~~.~~

A) Any GWS supplier that receives written notice from the Agency of a significant deficiency or which receives notice from a laboratory of a fecal indicator-positive groundwater source sample that is not invalidated by the Agency under Section 611.802(d) must inform its customers of any significant deficiency that is uncorrected at the time of the next report or of any fecal indicator-positive groundwater source sample in the next report. The supplier must continue to inform the public annually until the Agency, by a SEP, determines that particular significant deficiency is corrected or the fecal contamination in the groundwater source is addressed under Section 611.803(a). Each report must include the following information:

i) The nature of the particular significant deficiency or the source of the fecal contamination (if the source is known) and the date the significant deficiency was identified by the

Agency or the dates of the fecal indicator-positive groundwater source samples;

ii) Whether or not the fecal contamination in the groundwater source has been addressed under Section 611.803(a) and the date of such action;

iii) For each significant deficiency or fecal contamination in the groundwater source that has not been addressed under Section 611.803(a), the Agency-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed; and

iv) If the system receives notice of a fecal indicator-positive groundwater source sample that is not invalidated by the Agency under Section 611.802(d), the potential health effects using the health effects language of Appendix A.

B) If directed by the Agency by a SEP, a supplier with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected, and the date of correction under subsection (h)(6)(A).

7) Suppliers Required ~~required~~ to Comply ~~comply~~ with Subpart AA~~.~~

A) Any supplier required to comply with the Level 1 assessment requirement or a Level 2 assessment requirement that is not due to an E. coli MCL violation must include in the report the text found in subsections (h)(7)(A)(i) and (h)(7)(A)(ii) or (h)(7)(A)(i) and (h)(7)(A)(iii), as appropriate, filling in the blanks accordingly and the text found in subsection (h)(7)(A)(iv), if appropriate.

i) "Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments."

ii) "During the past year we were required to conduct [insert number of Level 1 assessments] Level 1 assessment(s). [insert number of Level 1 assessments] Level 1 assessment(s) were completed. In addition, we were required to take [insert number of corrective actions] corrective actions and we completed [insert number of corrective actions] of these actions."

iii) "During the past year [insert number of Level 2 assessments] Level 2 assessments were required to be completed for our water system. [insert number of Level 2 assessments] Level 2 assessments were completed. In addition, we were required to take [insert number of corrective actions] corrective actions and we completed [insert number of corrective actions] of these actions."

iv) Any supplier that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate: "During the past year we failed to conduct all of the required assessment(s)." or "During the past year we failed to correct all identified defects that were found during the assessment."

B) Any supplier required to conduct a Level 2 assessment due to an E. coli MCL violation must include in the report the text found in subsections (h)(7)(B)(i) and (h)(7)(B)(ii), filling in the blanks accordingly and the appropriate alternative text found in subsection (h)(7)(B)(ii), if appropriate.

i) "E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments."

ii) "We were required to complete a Level 2 assessment because we found E. coli in our water system. In addition, we were required to take [insert number of corrective actions] corrective actions and we completed [insert number of corrective actions] of these actions."

iii) Any supplier that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate: "We failed to conduct the required assessment." or "We failed to correct all sanitary defects that were identified during the assessment that we conducted."

C) If a supplier detects E. coli and has violated the E. coli MCL, in addition to completing the table, as required in subsection (d)(4), the supplier must include one or more of the following statements to describe any noncompliance, as applicable:

i) "We had an E. coli-positive repeat sample following a total coliform-positive routine sample."

ii) "We had a total coliform-positive repeat sample following an E. coli-positive routine sample."

iii) "We failed to take all required repeat samples following an E. coli-positive routine sample."

iv) "We failed to test for E. coli when any repeat sample tested positive for total coliform."

D) If a supplier detects E. coli and has not violated the E. coli MCL, in addition to completing the table as required in subsection (d)(4), the supplier may include a statement that explains that although it has detected E. coli, the supplier is not in violation of the E. coli MCL.

BOARD NOTE: Derived from 40 CFR 141.153~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART V: PUBLIC NOTIFICATION OF DRINKING WATER VIOLATIONS

Section 611.901 General Public Notification Requirements

The requirements of this Subpart V replace former notice requirements.

a) Who must give public notice. Each owner or operator of a public water system (a CWS, an NTNCWS, or a transient non-CWS) must give notice for all violations of an NPDWR and for other situations, as listed in this subsection (a). The term "NPDWR violation" is used in this Subpart V to include violations of an MCL, an MRDL, a treatment technique, monitoring requirements, or a testing procedure set forth in this Part. Appendix G identifies the tier assignment for each specific violation or situation requiring a public notice.

1) NPDWR Violations ~~violations.~~

A) A failure to comply with an applicable MCL or MRDL.

B) A failure to comply with a prescribed treatment technique.

C) A failure to perform water quality monitoring, as required by this Part.

D) A failure to comply with testing procedures as prescribed by this Part.

2) Relief Equivalent ~~equivalent~~ to a Variance ~~variance~~ and Exemptions ~~exemptions~~ under Sections ~~sections~~ 1415 and 1416 of SDWA.

A) Operation under relief equivalent to a SDWA section 1415 variance, under Section 611.111, or a SDWA section 1416 exemption, under Section 611.112.

B) A failure to comply with the requirements of any schedule that has been set under relief equivalent to a SDWA section 1415 variance, under Section 611.111, or a SDWA section 1415 exemption, under Section 611.112.

3) Special Public Notices ~~public notices.~~

A) The occurrence of a waterborne disease outbreak or other waterborne emergency.

B) An exceedance of the nitrate MCL by a non-CWS, where granted permission by the Agency under Section 611.300(d).

C) The notice required by Section 611.908 for an exceedance of 2 mg/ℓ fluoride (the federal secondary MCL for fluoride (see 40 CFR 143.3)).

BOARD NOTE: See the Board Note appended to Section 611.908 for explanation.

D) The availability of unregulated contaminant monitoring data collected as required by USEPA under 40 CFR 141.40.

E) Other violations and situations determined by the Agency by a SEP to require a public notice under this Subpart V, not already listed in Appendix G.

b) The Type ~~type~~ of Public Notice Required ~~public notice required~~ for Each

Violation ~~each violation~~ or Situation ~~situation~~. The public notice requirements of this Subpart V are divided into three tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The public notice requirements for each violation or situation listed in subsection (a) are determined by the tier to which it is assigned. This subsection (b) provides the definition of each tier. Appendix G identifies the tier assignment for each specific violation or situation.

1) Tier 1 public notice: required for NPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

2) Tier 2 public notice: required for all other NPDWR violations and situations with potential to have serious adverse effects on human health.

3) Tier 3 public notice: required for all other NPDWR violations and situations not included in Tier 1 and Tier 2.

c) Who Must Receive Notice ~~must receive notice.~~

1) Each PWS supplier must provide public notice to persons served by the water supplier, in accordance with this Subpart V. A PWS supplier that sells or otherwise provides drinking water to another PWS supplier (i.e., to a consecutive system) is required to give public notice to the owner or operator of the consecutive system; the consecutive system supplier is responsible for providing public notice to the persons it serves.

2) If a PWS supplier has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the Agency may allow the system to limit distribution of the public notice to only persons served by that portion of the system that is out of compliance. Permission by the Agency for limiting distribution of the notice must be granted in writing, by a SEP.

3) A copy of the notice must also be sent to the Agency, in accordance with the requirements under Section 611.840(d).

BOARD NOTE: Derived from 40 CFR 141.201 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.902 Tier 1 Public Notice: Form, Manner, and Frequency of Notice

a) Violations or Situations That Require ~~situations that require~~ a Tier 1 Public Notice ~~public notice~~. This subsection (a) lists the violation categories and other situations requiring a Tier 1 public notice. Appendix G identifies the tier assignment for each specific violation or situation. The violation categories include:

1) Violation of the MCL for E. coli (as specified in Section 611.325(c)).

2) Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in Section 611.301, or when the water supplier fails to take a confirmation sample within 24 hours after the supplier's receipt of the results from the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in Section 611.606(b).

3) Exceedance of the nitrate MCL by a non-CWS supplier, where permitted to exceed the MCL by the Agency under Section 611.300(d), as required under Section 611.909.

4) Violation of the MRDL for chlorine dioxide, as defined in Section 611.313(a), when one or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system exceed the MRDL, or when the water supplier does not take the required samples in the distribution system, as specified in Section 611.383(c)(2)(A).

5) This subsection (a)(5) refers to a violation of the former turbidity standard of Section 611.320, which the Board repealed because it applied to no suppliers in Illinois. This statement maintains structural consistency with the federal regulations.

6) Violation of the Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR), or Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit (as identified in Appendix G), where the Agency determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the supplier learns of the violation.

7) Occurrence of a waterborne disease outbreak, as defined in Section 611.101, or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination).

8) Detection of E. coli, enterococci, or coliphage in source water samples, as specified in Section 611.802(a) and (b).

9) Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the Agency by a SEP.

b) When the Tier 1 Public Notice Is ~~public notice~~ is to Be Provided ~~be provided~~. Additional Steps Required ~~steps required~~. A PWS supplier must do the following:

1) It must provide a public notice as soon as practical but no later than 24 hours after the supplier learns of the violation;

2) It must initiate consultation with the Agency as soon as practical, but no later than 24 hours after the PWS supplier learns of the violation or situation, to determine additional public notice requirements; and

3) It must comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the Agency. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.

c) The Form ~~form~~ and Manner ~~manner~~ of the Public Notice ~~public notice~~. A PWS supplier must provide the notice within 24 hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the PWS supplier are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, a water supplier is to use, at a minimum, one or more of the following forms of delivery:

1) Appropriate broadcast media (such as radio and television);

2) Posting of the notice in conspicuous locations throughout the area served by the water supplier;

3) Hand delivery of the notice to persons served by the water supplier; or

4) Another delivery method approved in writing by the Agency by a SEP.

BOARD NOTE: Derived from 40 CFR 141.202 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.903 Tier 2 Public Notice: Form, Manner, and Frequency of Notice

a) Violations or Situations That Require ~~situations that require~~ a Tier 2 Public Notice ~~public notice~~. This subsection (a) lists the violation categories and other situations requiring a Tier 2 public notice. Appendix G identifies the tier assignment for each specific violation or situation.

1) All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 notice is required under Section 611.902(a) or where the Agency determines by a SEP that a Tier 1 notice is required.

2) Violations of the monitoring and testing procedure requirements, where the Agency determines by a SEP that a Tier 2 rather than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation.

3) Failure to comply with the terms and conditions of any relief equivalent to a SDWA section 1415 variance or a SDWA section 1416 exemption in place.

4) Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or an Agency-approved combination of 4-log virus inactivation and removal) before or at the first customer under Section 611.803(a).

b) When Tier 2 Public Notice Is ~~public notice is~~ to Be Provided ~~be provided.~~

1) A PWS supplier must provide the public notice as soon as practical, but no later than 30 days after the supplier learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven days, even if the violation or situation is resolved. The Agency may, in appropriate circumstances, by a SEP, allow additional time for the initial notice of up to three months from the date the supplier learns of the violation. It is not appropriate for the Agency to grant an extension to the 30-day deadline for any unresolved violation or to allow across-the-board extensions by rule or policy for other violations or situations requiring a Tier 2 public notice. Extensions granted by the Agency must be in writing.

2) The PWS supplier must repeat the notice every three months as long as the violation or situation persists, unless the Agency determines that appropriate circumstances warrant a different repeat notice frequency. In no circumstance may the repeat notice be given less frequently than once per year. It is not appropriate for the Agency to allow less frequent repeat notice for an MCL or treatment technique violation under the Total Coliform Rule or Subpart AA or a treatment technique violation under the Surface Water Treatment Rule or Interim Enhanced Surface Water Treatment Rule. It is also not appropriate for the Agency to allow across-the-board reductions in the repeat notice frequency for other ongoing violations requiring a Tier 2 repeat notice. An Agency determination allowing repeat notices to be given less frequently than once every three months must be in writing.

3) For the turbidity violations specified in this subsection (b)(3), a PWS supplier must consult with the Agency as soon as practical but no later than 24 hours after the supplier learns of the violation, to determine whether a Tier 1 public notice under Section 611.902(a) is required to protect public health. When consultation does not take place within the 24-hour period, the water system must distribute a Tier 1 notice of the violation within the next 24 hours (i.e., no later than 48 hours after the supplier learns of the violation), following the requirements under Section 611.902(b) and (c). Consultation with the Agency is required for the following:

A) Violation of the turbidity MCL under Section 611.320(b); or

B) Violation of the SWTR, IESWTR, or treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit.

c) The Form ~~form~~ and Manner ~~manner~~ of Tier 2 Public Notice ~~public notice~~. A PWS supplier must provide the initial public notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

1) Unless directed otherwise by the Agency in writing, by a SEP, a CWS supplier must provide notice by the following:

A) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the PWS supplier; and

B) Any other method reasonably calculated to reach other persons regularly served by the supplier, if they would not normally be reached by the notice required in subsection (c)(1)(A). Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places served by the supplier or on the Internet; or delivery to community organizations.

2) Unless directed otherwise by the Agency in writing, by a SEP, a non-CWS supplier must provide notice by the following means:

A) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the supplier, or by mail or direct delivery to each customer and service connection (where known); and

B) Any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by the notice required in subsection (c)(2)(A). Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include the following: Publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or delivery of multiple copies in central locations (e.g., community centers).

BOARD NOTE: Derived from 40 CFR 141.203 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.904 Tier 3 Public Notice: Form, Manner, and Frequency of Notice

a) Violations or Situations That Require ~~situations that require~~ a Tier 3 Public Notice ~~public notice~~. This subsection (a) lists the violation categories and other situations requiring a Tier 3 public notice. Appendix G identifies the tier assignment for each specific violation or situation.

1) Monitoring violations under this Part, except where a Tier 1 notice is required under Section 611.902(a) or where the Agency determines by a SEP that a Tier 2 notice is required;

2) Failure to comply with a testing procedure established in this Part, except where a Tier 1 notice is required under Section 611.902(a) or where the Agency determines by a SEP that a Tier 2 notice is required;

3) Operation under relief equivalent to a SDWA section 1415 variance granted under Section 611.111 or relief equivalent to a SDWA section 1416 exemption granted under Section 611.112;

4) Availability of unregulated contaminant monitoring results, as required under Section 611.907;

5) The notice for an exceedance of 2 mg/ℓ fluoride (the federal secondary MCL for fluoride (see 40 CFR 143.3)), as required under Section 611.908; and

BOARD NOTE: See the Board Note appended to Section 611.908 for explanation.

6) Reporting and recordkeeping violations under Subpart AA.

b) When the Tier 3 Public Notice Is To Be Provided ~~public notice is to be provided.~~

1) A PWS supplier must provide the public notice not later than one year after the supplier learns of the violation or situation or begins operating under relief equivalent to a SDWA section 1415 variance or section 1416 exemption. Following the initial notice, the supplier must repeat the notice annually for as long as the violation, relief equivalent to a SDWA section 1415 variance or section 1416 exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, relief equivalent to a SDWA section 1415 variance or section 1416 exemption, or other situation persists, but in no case less than seven days (even if the violation or situation is resolved).

2) Instead of individual Tier 3 public notices, a PWS supplier may use an annual report detailing all violations and situations that occurred during the previous twelve months, as long as the timing requirements of subsection (b)(1) are met.

c) The Form ~~form~~ and Manner ~~manner~~ of the Tier 3 Public Notice ~~public notice~~. A PWS supplier must provide the initial notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

1) Unless directed otherwise by the Agency by a SEP in writing, a CWS supplier must provide notice by the following:

A) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the supplier; and

B) Any other method reasonably calculated to reach other persons regularly served by the supplier, if they would not normally be reached by the notice required in subsection (c)(1)(A). Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include the following: publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations.

2) Unless directed otherwise by the Agency by a SEP in writing, a non-CWS supplier must provide notice by the following:

A) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the supplier, or by mail or direct delivery to each customer and service connection (where known); and

B) Any other method reasonably calculated to reach other persons served by the supplier, if they would not normally be reached by the notice required in subsection (c)(2)(A). Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by. Other methods may include the following: publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or delivery of multiple copies in central locations (e.g., community centers).

d) When the Consumer Confidence Report May Be Used ~~may be used~~ to Meet ~~meet~~ the Tier 3 Public Notice Requirements ~~public notice requirements~~. For a CWS supplier, the Consumer Confidence Report (CCR) required under Subpart U may be used as a vehicle for the initial Tier 3 public notice and all required repeat notices, as long as the following is true:

1) The CCR is provided to persons served no later than 12 months after the supplier learns of the violation or situation as required under Section 611.904(b);

2) The Tier 3 notice contained in the CCR follows the content requirements under Section 611.905; and

3) The CCR is distributed following the delivery requirements under Section 611.904(c).

BOARD NOTE: Derived from 40 CFR 141.204 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.905 Content of the Public Notice

a) Elements Included ~~included~~ in Public Notice ~~public notice~~ for Violation ~~violation~~ of an NPDWR or Other Situations ~~other situations~~. When a PWS supplier violates an NPDWR or has a situation requiring public notification, each public notice must include the following elements:

1) A description of the violation or situation, including the contaminants of concern, and (as applicable) the contaminant levels;

2) When the violation or situation occurred;

3) Any potential adverse health effects from the violation or situation, including the standard language under subsection (d)(1) or (d)(2), whichever is applicable;

4) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;

5) Whether alternative water supplies should be used;

6) What actions consumers should take, including when they should seek medical help, if known;

7) What the supplier is doing to correct the violation or situation;

8) When the water supplier expects to return to compliance or resolve the situation;

9) The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and

10) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under subsection (d)(3), where applicable.

b) The Elements That Must Be Included ~~elements that must be included~~ in the Public Notice ~~public notice~~ for Public Water Systems Operating ~~public water systems operating~~ under Relief Equivalent ~~relief equivalent~~ to a SDWA Section ~~section~~ 1415 Variance ~~variance~~ or a Section ~~section~~ 1416 Exemption ~~exemption.~~

1) If a PWS supplier has been granted a relief equivalent to a SDWA section 1415 variance, under Section 611.111, or a section 1416 exemption, under Section 611.112, the public notice must contain the following:

    A) An explanation of the reasons for the relief equivalent to a SDWA section 1415 variance or a section 1416 exemption;

    B) The date on which the relief equivalent to a SDWA section 1415 variance or a section 1416 exemption was issued;

    C) A brief status report on the steps that the supplier is taking to install treatment, find alternative sources of water, or otherwise comply with the terms and schedules of the relief equivalent to a SDWA section 1415 variance or a section 1416 exemption; and

D) A notice of any opportunity for public input in the review of the relief equivalent to a SDWA section 1415 variance or a section 1416 exemption.

2) If a PWS supplier violates the conditions of relief equivalent to a SDWA section 1415 variance or a section 1416 exemption, the public notice must contain the ten elements listed in subsection (a).

c) How the Public Notice Is ~~public notice is~~ to Be Presented ~~be presented.~~

1) Each public notice required by this Section must comply with the following:

A) It must be displayed in a conspicuous way when printed or posted;

B) It must not contain overly technical language or very small print;

C) It must not be formatted in a way that defeats the purpose of the notice;

D) It must not contain language that nullifies the purpose of the notice.

2) Each public notice required by this Section must comply with multilingual requirements, as follows:

A) For a PWS supplier serving a large proportion of non-English speaking consumers, the public notice must contain information in the appropriate languages regarding the importance of the notice or contain a telephone number or address where persons served may contact the water supplier to obtain a translated copy of the notice or to request assistance in the appropriate language.

B) In cases where the Agency has not determined what constitutes a large proportion of non-English speaking consumers, the PWS supplier must include in the public notice the same information as in subsection (c)(2)(A), where appropriate to reach a large proportion of non-English speaking persons served by the water supplier.

d) Standard Language That ~~language that~~ a PWS Supplier Must Include ~~supplier must include~~ in Its Public Notice ~~its public notice~~. A PWS supplier is required to include the following standard language in its public notice:

1) Standard Health Effects Language ~~health effects language~~ for MCL or MRDL Violations, Treatment Technique Violations, ~~violations, treatment technique violations,~~ and Violations ~~violations~~ of the Condition ~~condition~~ of Relief Equivalent ~~relief equivalent~~ to a SDWA Section ~~section~~ 1415

Variance ~~variance~~ or a Section ~~section~~ 1416 Exemption ~~exemption~~. A PWS supplier must include in each public notice the health effects language specified in Appendix H corresponding to each MCL, MRDL, and treatment technique violation listed in Appendix G, and for each violation of a condition of relief equivalent to a SDWA section 1415 variance or a section 1416 exemption.

2) Standard Language ~~language~~ for Monitoring ~~monitoring~~ and Testing Procedure Violations ~~testing procedure violations~~. A PWS supplier must include the following language in its notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations listed in Appendix G:

> We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During (compliance period), we "did not monitor or test" or "did not complete all monitoring or testing" for (contaminants), and therefore cannot be sure of the quality of your drinking water during that time.

3) Standard Language ~~language~~ to Encourage ~~encourage~~ the Distribution ~~distribution~~ of the Public Notice ~~public notice~~ to All Persons Served ~~all persons served~~. A PWS supplier must include the following language in its notice (where applicable):

> Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

BOARD NOTE: Derived from 40 CFR 141.205 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.906 Notice to New Billing Units or New Customers

a) The Requirement ~~requirement~~ for a CWS. A CWS supplier must give a copy of the most recent public notice for any continuing violation, the existence of relief equivalent to a SDWA section 1415 variance or a section 1416 exemption, or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

b) The Requirement ~~requirement~~ for non-CWS. A non-CWS supplier must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, relief equivalent to a SDWA section 1415 variance or a section 1416 exemption, or other situation requiring a public notice for as long as the violation, the relief equivalent to a SDWA section 1415 variance or a section 1416 exemption, or other situation persists.

BOARD NOTE: Derived from 40 CFR 141.206 ~~(2002)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.907 Special Notice of the Availability of Unregulated Contaminant Monitoring Results

a) When to Give Special Notice ~~give special notice~~. The owner or operator of a CWS supplier or an NTNCWS supplier required to monitor for unregulated contaminants by USEPA under ~~pursuant to~~ 40 CFR 141.40 must notify persons served by the supplier of the availability of the results of such sampling no later than 12 months after the monitoring results are known.

b) The Form ~~form~~ and Manner ~~manner~~ of a Special Notice ~~special notice~~. The form and manner of the public notice must follow the requirements for a Tier 3 public notice prescribed in Sections 611.904(c), (d)(1), and (d)(3). The notice must also identify a person and provide the telephone number to contact for information on the monitoring results.

BOARD NOTE: Derived from 40 CFR 141.207 ~~(2014)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.908 Special Notice for Exceedance ~~Exceedence~~ **of the Fluoride Secondary Standard**

a) When to Give Special Notice ~~give special notice~~. A CWS supplier that exceeds the federal fluoride secondary MCL of 2 mg/ℓ (see 40 CFR 143.3)) (determined by the last single sample taken in accordance with Section 611.603), but does not exceed the maximum contaminant level (MCL) of 4 mg/ℓ for fluoride (as specified in Section 611.301), must provide the public notice in subsection (c) to persons served. Public notice must be provided as soon as practical but no later than 12 months from the day the supplier learns of the exceedance. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and to the Department of Public Health. The PWS supplier must repeat the notice at least annually for as long as the SMCL is exceeded. If the public notice is posted, the notice must remain in place for as long as the fluoride SMCL is exceeded, but in no case less than seven days (even if the exceedance is eliminated). On a case-by-case basis, the Agency may require an initial notice sooner than 12 months and repeat notices more frequently than annually.

BOARD NOTE: The federal regulations provide at 40 CFR 143.1 that secondary MCLs relate to the aesthetic qualities of water; they are not enforceable standards. The National Primary Drinking Water Regulations, however, include an enforceable requirement, at corresponding 40 CFR 141.208, that requires public notice upon exceedance of the secondary MCL for fluoride.

b) The Form ~~form~~ and Manner ~~manner~~ of a Special Notice ~~special notice~~. The form and manner of the public notice (including repeat notices) must follow the requirements for a Tier 3 public notice in Section 611.904(c), (d)(1), and (d)(3).

c) Mandatory Language ~~language~~ in a Special Notice ~~special notice~~. The notice must contain the following language, including the language necessary to fill in the blanks:

> This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/ℓ) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system (name) has a fluoride concentration of (insert value) mg/ℓ. Dental fluorosis, in its moderate or severe forms, may result in a brown staining or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.
>
> Drinking water containing more than 4 mg/ℓ of fluoride (the USEPA's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/ℓ of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/ℓ because of this cosmetic dental problem.
>
> For more information, please call (name of water system contact) of (name of community water system) at (phone number). Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP.

BOARD NOTE: Derived from 40 CFR 141.208 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.909 Special Notice for Nitrate Exceedances ~~Exceedences~~ above the MCL by a Non-Community Water System

a) When the Special Notice Is ~~special notice is~~ to Be Given ~~be given~~. The owner or operator of a non-CWS supplier granted permission by the Agency under Section 611.300(d) to exceed the nitrate MCL must provide notice to persons served according to the requirements for a Tier 1 notice under Section 611.902(a) and (b).

b) The Form ~~form~~ and Manner ~~manner~~ of a Special Notice ~~special notice~~. A non-CWS supplier granted permission by the Agency to exceed the nitrate MCL under Section 611.300(d) must provide continuous posting of the fact that nitrate levels exceed 10 mg/ℓ and the potential health effects of exposure, according to the requirements for Tier 1 notice delivery under Section 611.902(c) and the content requirements under Section 611.905.

BOARD NOTE: Derived from 40 CFR 141.209 ~~(2014)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.911 Special Notice for Cryptosporidium

a) When the Special Notice ~~special notice~~ for Repeated Failure ~~repeated failure~~ to Monitor Must Be Given ~~monitor must be given~~. The owner or operator of a CWS or non-CWS that is required to monitor source water under ~~pursuant to~~ Section 611.1001 must notify persons served by its water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect any three months of monitoring, as specified in Section 611.1001(c). The notice must be repeated as specified in Section 611.903(b).

b) When the Special Notice ~~special notice~~ for Failure ~~failure~~ to Determine Bin Classification ~~determine bin classification~~ or Mean ~~mean~~ Cryptosporidium Level Must Be Given ~~level must be given~~. The owner or operator of a CWS or non-CWS that is required to determine a bin classification under ~~pursuant to~~ Section 611.1010, or one that is required to determine mean Cryptosporidium level under ~~pursuant to~~ Section 611.1012, must notify persons served by its water system that the determination has not been made as required no later than 30 days after the system has failed report the determination as specified in Section 611.1010(e) or Section 611.1012(a), respectively. The supplier must repeat the notice as specified in Section 611.903(b). The notice is not required if the system is complying with an Agency-approved schedule to address the violation.

c) The Form ~~form~~ and Manner ~~manner~~ of a Special Notice ~~special notice~~. The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in Section 611.903(c). The public notice must be presented as required in Section 611.905(c).

d) Mandatory Language That Must Be Contained ~~language that must be contained~~ in the Special Notice ~~special notice~~. The notice must contain all of the following language, including the language necessary to fill in the blanks:

1) The special notice for repeated failure to conduct monitoring must contain the following mandatory language:

> We are required to monitor the source of your drinking water for Cryptosporidium. Results of the monitoring are to be used to determine whether water treatment at the [treatment plant name] is sufficient to adequately remove Cryptosporidium from your drinking water. We are required to complete this monitoring and make this determination before [required bin determination date]. We [insert the applicable of the following at this point: "did not monitor or test" or "did not complete all monitoring or testing"] on schedule and, therefore, we may not be able to determine before the required date what treatment modifications, if any, must be made to ensure adequate Cryptosporidium removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed before the deadline required, [date]. For more information, please call [name of water system contact] of [name of water system] at [phone number].

2) The special notice for failure to determine bin classification or mean Cryptosporidium level must contain the following mandatory language:

> We are required to monitor the source of your drinking water for Cryptosporidium in order to determine before [date] whether water treatment at the [treatment plant name] is sufficient to adequately remove Cryptosporidium from your drinking water. We have not made this determination before the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed before the required deadline of [date]. For more information, please call [name of water system contact] of [name of water system] at [phone number].

3) Each special notice must also include a description of what the supplier is doing to correct the violation and when the supplier expects to return to compliance or resolve the situation.

BOARD NOTE: Derived from 40 CFR 141.211 ~~(2006)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART W: INITIAL DISTRIBUTION SYSTEM EVALUATIONS

Section 611.921 Standard Monitoring

a) Standard Monitoring Plan ~~monitoring plan~~. A supplier's standard monitoring plan must comply with subsections (a)(1) through (a)(4). The supplier must prepare and submit its standard monitoring plan to the Agency according to the appropriate of the schedules provided in Section 611.920(c).

1) The supplier's standard monitoring plan must include a schematic of its distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected Subpart I compliance monitoring.

2) The supplier's standard monitoring plan must include justification of standard monitoring location selection and a summary of data the supplier relied on to justify standard monitoring location selection.

3) The supplier's standard monitoring plan must specify the population served and its system type (i.e., that it is a Subpart B or groundwater system).

4) The supplier must retain a complete copy of its standard monitoring plan submitted under this subsection (a), including any Agency modification of the plan, for as long as the supplier is required to retain its IDSE report under subsection (c)(4).

b) Standard Monitoring ~~monitoring.~~

1) The supplier must monitor as indicated in the applicable of subsections (b)(1)(A) through (b)(1)(P), subject to the limitations of subsections (b)(1)(Q) and (b)(1)(R). The supplier must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5. The supplier must conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. The supplier must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

A) A Subpart B system supplier that serves fewer than 500 persons and which operates a consecutive system must collect samples once each calendar year during the peak historical month: one near an entry point to the distribution system and one at a high TTHM location, for a total of two samples during each monitoring period.

B) A Subpart B system supplier that serves fewer than 500 persons and which does not operate a consecutive system must collect samples once each calendar year during the peak historical month: one at a high TTHM location and one at a high HAA5 location, for a total of two samples during each monitoring period.

C) A Subpart B system supplier that serves 500 to 3,300 persons and which operates a consecutive system must collect samples four times each calendar year (once every 90 days): one near an entry point to the distribution system and one at a high TTHM location, for a total of two samples during each monitoring period.

D) A Subpart B system supplier that serves 500 to 3,300 persons and which does not operate a consecutive system must collect samples four times each calendar year (once every 90 days): one at a high TTHM location and one at a high HAA5 location, for a total of two samples during each monitoring period.

E) A Subpart B system supplier that serves 3,301 to 9,999 persons must collect samples four times each calendar year (once every 90 days): one at a location in the distribution system that represents the average residence time, two at high TTHM locations, and one at a high HAA5 location, for a total of four samples during each monitoring period.

F) A Subpart B system supplier that serves 10,000 to 49,999 persons must collect samples six times each calendar year (once every 60 days): one near an entry point to the distribution system, two at locations in the distribution system that represent the average residence time, three at each TTHM location, and two at high HAA5 locations, for a total of eight samples during each monitoring period.

G) A Subpart B system supplier that serves 50,000 to 249,999 persons must collect samples six times each calendar year (once every 60 days): three near entry points to the distribution system, four at locations in the distribution system that represent the average residence time, five at high TTHM locations, and four at high HAA5 locations, for a total of 16 samples during each monitoring period.

H) A Subpart B system supplier that serves 250,000 to 999,999 persons must collect samples six times each calendar year (once every 60 days): four near entry points to the distribution system, six at locations in the distribution system that represent the average residence time, eight at high TTHM locations, and six at high

HAA5 locations, for a total of 24 samples during each monitoring period.

I) A Subpart B system supplier that serves 1,000,000 to 4,999,999 persons must collect samples six times each calendar year (once every 60 days): six near entry points to the distribution system, eight at locations in the distribution system that represent the average residence time, ten ~~10~~ at high TTHM locations, and eight at high HAA5 locations, for a total of 32 samples during each monitoring period.

J) A Subpart B system supplier that serves 5,000,000 or more persons must collect samples six times each calendar year (once every 60 days): eight near entry points to the distribution system, ten ~~10~~ at locations in the distribution system that represent the average residence time, 12 at high TTHM locations, and ten ~~10~~ at high HAA5 locations, for a total of 40 samples during each monitoring period.

K) A groundwater system supplier that serves fewer than 500 persons and which operates a consecutive system must collect samples once each calendar year during the peak historical month: one near an entry point to the distribution system and one at a high TTHM location, for a total of two samples during each monitoring period.

L) A groundwater system supplier that serves fewer than 500 persons and which does not operate a consecutive system must collect samples once each calendar year during the peak historical month: one at a high TTHM location and one at a high HAA5 location, for a total of two samples during each monitoring period.

M) A groundwater system supplier that serves 500 to 9,999 persons must collect samples four times each calendar year (once every 90 days): one at a high TTHM location and one at a high HAA5 location, for a total of two samples during each monitoring period.

N) A groundwater system supplier that serves 10,000 to 99,999 persons must collect samples four times each calendar year (once every 90 days): one near an entry point to the distribution system, one at a location in the distribution system that represents the average residence time, two at high TTHM locations, and two at high HAA5 locations, for a total of six samples during each monitoring period.

O) A groundwater system supplier that serves 100,000 to 499,999 persons must collect samples four times each calendar year (once every 90 days): one near an entry point to the distribution system, one at a location in the distribution system that represents the average residence time, three at high TTHM locations, and three at high HAA5 locations, for a total of eight samples during each monitoring period.

P) A groundwater system supplier that serves 500,000 or more persons must collect samples four times each calendar year (once every 90 days): two near an entry point to the distribution system, two at locations in the distribution system that represent the average residence time, four at high TTHM locations, and four at high HAA5 locations, for a total of 12 samples during each monitoring period.

Q) A dual sample set (i.e., a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.

R) The "peak historical month", for the purposes of subsections (b)(1)(A), (b)(1)(B), (b)(1)(K), and (b)(1)(L), means the month with the highest TTHM or HAA5 levels or the warmest water temperature.

2) The supplier must take samples at locations other than the existing Subpart I monitoring locations. Monitoring locations must be distributed throughout the distribution system.

3) If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be equally replaced at high TTHM and HAA5 locations. If there is an odd extra location number, the supplier must take a sample at a high TTHM location. If the number of entry points to the distribution system is more than the specified number of entry point monitoring locations, the supplier must take samples at the entry points to the distribution system that have the highest annual water flows.

4) The supplier's monitoring under this subsection (b) may not be reduced under the provisions of Section 611.500, and the Agency may not reduce the supplier's monitoring using the provisions of Section 611.161.

c) IDSE Report ~~report~~. A supplier's IDSE report must include the elements required in subsections (c)(1) through (c)(4). The supplier must submit its IDSE report to the Agency according to the applicable of the schedules set forth in Section 611.920(c).

1) The supplier's IDSE report must include all TTHM and HAA5 analytical results from Subpart I compliance monitoring and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the

Agency. If changed from the supplier's standard monitoring plan submitted under ~~pursuant to~~ subsection (a), the supplier's report must also include a schematic of the supplier's distribution system, the population served, and system type (Subpart B system or groundwater system).

2) The supplier's IDSE report must include an explanation of any deviations from the supplier's approved standard monitoring plan.

3) The supplier must recommend and justify Subpart Y compliance monitoring locations and timing based on the protocol in Section 611.925.

4) The supplier must retain a complete copy of its IDSE report submitted under this Section for ten ~~10~~ years after the date on which the supplier submitted the supplier's report. If the Agency modifies the Subpart Y monitoring requirements that the supplier recommended in its IDSE report or if the Agency approves alternative monitoring locations under ~~pursuant to~~ Section 611.161, the supplier must keep a copy of the Agency's notification on file for ten ~~10~~ years after the date of the Agency's notification. The supplier must make the IDSE report and any Agency notification available for review by the Agency or the public.

BOARD NOTE: Derived from 40 CFR 141.601~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.922 System-Specific Studies

a) System-Specific Study Plan~~System-specific study plan~~. A supplier's system-specific study plan must be based on either existing monitoring results, as required under subsection (a)(1), or modeling, as required under subsection (a)(2). The supplier must prepare and submit the supplier's system-specific study plan to the Agency according to the schedule in Section 611.920(c).

1) Existing~~ Monitoring Results monitoring results~~. A supplier may comply by submitting monitoring results collected before it is required to begin monitoring under Section 611.920(c). The monitoring results and analysis must meet the criteria in subsections (a)(1)(A) and (a)(1)(B).

A) Minimum Requirements~~ requirements.~~

i) TTHM and HAA5 results must be based on samples collected and analyzed in accordance with Section 611.381. Samples must be collected no earlier than five years prior to the study plan submission date.

ii) The monitoring locations and frequency must meet the conditions identified in the applicable of subsections (a)(1)(A)(iii) through (a)(1)(A)(xv). Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all Subpart I compliance monitoring results, plus additional monitoring results as necessary to meet minimum sample requirements.

iii) A Subpart B system supplier that serves fewer than 500 persons must collect samples from three monitoring locations: three samples for TTHM and three samples for HAA5.

iv) A Subpart B system supplier that serves 500 to 3,300 persons must collect samples from three monitoring locations: nine samples for TTHM and nine samples for HAA5.

v) A Subpart B system supplier that serves 3,301 to 9,999 persons must collect samples from six monitoring locations: 36 samples for TTHM and 36 samples for HAA5.

vi) A Subpart B system supplier that serves 10,000 to 49,999 persons must collect samples from each of 12 monitoring locations: 72 samples for TTHM and 72 samples for HAA5.

vii) A Subpart B system supplier that serves 50,000 to 249,999 persons must collect samples from 24 monitoring locations: 144 samples for TTHM and 144 samples for HAA5.

viii) A Subpart B system supplier that serves 250,000 to 999,999 persons must collect samples from 36 monitoring locations: 216 samples for TTHM and 216 samples for HAA5.

ix) A Subpart B system supplier that serves 1,000,000 to 4,999,999 persons must collect samples from 48 monitoring locations: 288 samples for TTHM and 288 samples for HAA5.

x) A Subpart B system supplier that serves 5,000,000 or more persons must collect samples from 60 monitoring locations: 360 samples for TTHM and 360 samples for HAA5.

xi) A groundwater system supplier that serves fewer than 500 persons must collect samples from three monitoring locations: three samples for TTHM and three samples for HAA5.

xii) A groundwater system supplier that serves 500 to 9,999 persons must collect samples from three monitoring locations: nine samples for TTHM and nine samples for HAA5.

xiii) A groundwater system supplier that serves 10,000 to 99,999 persons must collect samples from 12 monitoring locations: 48 samples for TTHM and 48 samples for HAA5.

xiv) A groundwater system supplier that serves 100,000 to 499,999 persons must collect samples from 18 monitoring locations: 72 samples for TTHM and 72 samples for HAA5.

xv) A groundwater system supplier that serves 500,000 or more persons must collect samples from 24 monitoring locations: 96 samples for TTHM and 96 samples for HAA5.

B) Reporting Monitoring Results ~~monitoring results~~. A supplier must report the following information:

i) The supplier must report previously collected monitoring results and certify that the reported monitoring results include all compliance and noncompliance results generated during the time period that began with the first reported result and which ended with the most recent Subpart I results;

ii) The supplier must certify that the samples were representative of the entire distribution system and treatment and that the distribution system and treatment have not changed significantly since the samples were collected;

iii) The supplier's study monitoring plan must include a schematic of its distribution system (including distribution system entry points and their sources and storage facilities in the system), with notes indicating the locations and dates of all completed or planned system-specific study monitoring;

iv) The supplier's system-specific study plan must specify the population served and its system type (i.e., that it is a Subpart B or groundwater system);

v) The supplier must retain a complete copy of its system-specific study plan submitted under this subsection (a)(1), including any Agency modification of the supplier's system-specific study plan, for as long as the supplier is required to retain its IDSE report under subsection (b)(5); and

vi) If the supplier submits previously collected data that fully meet the number of samples required under subsection (a)(1)(A)(ii), and the Agency rejects some of the data in writing, by a SEP, the supplier must either conduct additional monitoring to replace rejected data on a schedule approved by the Agency in the SEP, or it must conduct standard monitoring under Section 611.921.

2) Modeling. A supplier may comply through analysis of an extended-period simulation hydraulic model. The extended-period simulation hydraulic model and analysis must meet the following criteria:

A) Minimum Extended-Period Hydraulic Model Requirements ~~extended-period hydraulic model requirements.~~

i) The extended-period hydraulic model must simulate 24-hour variation in demand and show a consistently repeating 24-hour pattern of residence time.

ii) The extended-period hydraulic model must represent the criteria listed in subsection (a)(2)(D).

BOARD NOTE: This subsection (a)(2)(A)(ii) is derived from 40 CFR 141.602(a)(2)(i)(B)~~, as added at 71 Fed. Reg. 388 (Jan. 4, 2006)~~. The Board has codified 40 CFR 141.602(a)(2)(i)(B)(*1*) through (a)(2)(i)(B)(*9*) as subsections (a)(2)(D)(i) through (a)(2)(D)(ix) to comport with Illinois Administrative Code codification requirements.

iii) The extended-period hydraulic model must be calibrated or have calibration plans for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities in the system must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after the supplier has submitted the plan.

B) Reporting Modeling ~~modeling~~. The supplier's system-specific study plan must include the information described in subsections (a)(2)(B)(i) through (a)(2)(B)(vii), subject to the requirements of subsection (a)(2)(B)(vii).

i) Tabular or spreadsheet data demonstrating that the model meets requirements in subsections (a)(2)(A)(ii) and (a)(2)(D).

ii) A description of all calibration activities undertaken and, if calibration is complete, a graph of predicted tank levels versus measured tank levels for the system storage facility with the highest residence time in each pressure zone, and a time-series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes for the model to reach a consistently repeating pattern of residence time).

iii) Model output showing preliminary 24-hour average residence time predictions throughout the distribution system.

iv) The timing and the number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual-sample monitoring at a number of locations no fewer than would be required for the system under standard monitoring in Section 611.921 during the historical month of high TTHM. These samples must be taken at locations other than existing Subpart I compliance monitoring locations.

v) A description of how all requirements will be completed no later than 12 months after the supplier submits the supplier's system-specific study plan.

vi) A schematic of the supplier's distribution system (including distribution system entry points and their sources and system storage facilities), with notes indicating the locations and dates of all completed system-specific study monitoring (if calibration is complete) and all Subpart I compliance monitoring.

vii) The population served and system type (i.e., that it is a Subpart B or groundwater system).

viii) The supplier must retain a complete copy of the supplier's system-specific study plan submitted under this subsection (a)(2), including any Agency modification of the supplier's system-specific study plan, for as long as the supplier is required to retain the supplier's IDSE report under subsection (b)(7).

C) If the supplier submits a model that does not fully meet the requirements under subsection (a)(2), the supplier must correct the Agency-cited deficiencies and respond to Agency inquiries concerning the model. If the supplier fails to correct deficiencies or respond to inquiries to the

Agency's satisfaction, the supplier must conduct standard monitoring under Section 611.921.

D) The extended-period hydraulic model must represent the following criteria:

i) 75 percent of pipe volume;

ii) 50 percent of pipe length;

iii) All pressure zones;

iv) All 12-inch diameter and larger pipes;

v) All eight-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves or which are known or expected to be significant conveyors of water;

vi) All six-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;

vii) All storage facilities with standard operations represented in the model;

viii) All active pump stations with controls represented in the model; and

ix) All active control valves.

BOARD NOTE: This subsection (a)(2)(D) is derived from 40 CFR 141.602(a)(2)(i)(B)~~, as added at 71 Fed. Reg. 388 (Jan. 4, 2006)~~. The Board has codified 40 CFR 141.602(a)(2)(i)(B)(*1*) through (a)(2)(i)(B)(*9*) as subsections (a)(2)(D)(i) through (a)(2)(D)(ix) to comport with Illinois Administrative Code codification requirements.

b) IDSE Report ~~report~~. The supplier's IDSE report must include the elements required in subsections (b)(1) through (b)(6). The supplier must submit its IDSE report according to the applicable of the schedules in Section 611.920(c).

1) The supplier's IDSE report must include all TTHM and HAA5 analytical results from Subpart I compliance monitoring and all system-specific study monitoring conducted during the period of the system-specific study presented in a tabular or spreadsheet format acceptable to the Agency. If changed from the supplier's system-specific study plan submitted under subsection (a), the supplier's IDSE report must also include a schematic of its distribution system, the population served, and system type (i.e., that it is a Subpart B or groundwater system).

2) If the supplier used the modeling provision under subsection (a)(2), it must include final information for the elements described in subsection (a)(2)(B), and a 24-hour time-series graph of residence time for each Subpart Y compliance monitoring location selected.

3) The supplier must recommend and justify Subpart Y compliance monitoring locations and timing based on the protocol in Section 611.925.

4) The supplier's IDSE report must include an explanation of any deviations from its approved system-specific study plan.

5) The supplier's IDSE report must include the basis (analytical and modeling results) and justification that it used to select the recommended Subpart Y monitoring locations.

6) The supplier may submit its IDSE report in lieu of its system-specific study plan on the schedule identified in Section 611.920(c) for submission of the system-specific study plan if the supplier believes that it has the necessary information before the time that the system-specific study plan is due. If the supplier elects this approach, its IDSE report must also include all information required under subsection (a).

7) The supplier must retain a complete copy of its IDSE report submitted under this Section for ten ~~10~~ years after the date that the supplier submitted its IDSE report. If the Agency modifies the Subpart Y monitoring requirements that the supplier recommended in the supplier's IDSE report or if the Agency approves alternative monitoring locations, the supplier must keep a copy of the Agency's notification on file for ten ~~10~~ years after the date of the Agency's notification. The supplier must make the IDSE report and any Agency notification available for review by the Agency or the public.

BOARD NOTE: Derived from 40 CFR 141.602 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.923 40/30 Certification

a) Eligibility. A supplier is eligible for 40/30 certification if it had no TTHM or HAA5 monitoring violations under Subpart I and no individual sample exceeded 0.040 mg/ℓ for TTHM or 0.030 mg/ℓ for HAA5 during an eight consecutive calendar quarter period during implementation of this Subpart W. Eligibility for 40/30 certification is based on eight consecutive calendar quarters of Subpart I compliance monitoring results, unless the supplier is on reduced monitoring under Subpart I and was not required to monitor. If the supplier did not monitor, the supplier must base its eligibility on compliance samples taken during the preceding 12 months.

BOARD NOTE: Implementation of this Subpart W occurred in stages between October 1, 2006 through October 1, 2014. The monitoring that formed the basis of 40/30 certification was based on monitoring that began either January 2004 or January 2005, depending on population served and other factors. See 40 CFR 141.600(c) and 141.603(a). The Board removed the now-obsolete implementation dates.

b) 40/30 Certification ~~certification.~~

1) A supplier must certify to the Agency that every individual compliance sample taken under Subpart I during the applicable of the periods specified in subsection (a) were no more than 0.040 mg/ℓ for TTHM and 0.030 mg/ℓ for HAA5, and that the supplier has not had any TTHM or HAA5 monitoring violations during the period specified in subsection (a).

2) The Agency may require the supplier to submit compliance monitoring results, distribution system schematics, or recommended Subpart Y compliance monitoring locations in addition to the supplier's certification. If the supplier fails to submit the requested information, the Agency may require standard monitoring under Section 611.921 or a system-specific study under Section 611.922.

3) The Agency may still require standard monitoring under Section 611.921 or a system-specific study under Section 611.922 even if the supplier meets the criteria in subsection (a).

4) The supplier must retain a complete copy of its certification submitted under this Section for ten ~~10~~ years after the date that it submitted the supplier's certification. The supplier must make the certification, all data upon which the certification is based, and any Agency notification available for review by the Agency or the public.

BOARD NOTE: Derived from 40 CFR 141.603 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.924 Very Small System Waivers

a) If the supplier serves fewer than 500 people and it has taken TTHM and HAA5 samples under Subpart I, the supplier is not required to comply with this Subpart W unless the Agency notifies the supplier, by a SEP, that it must conduct standard monitoring under ~~pursuant to~~ Section 611.921 or a system-specific study under Section 611.922.

b) If the supplier has not taken TTHM and HAA5 samples under Subpart I or if the Agency notifies the supplier, by a SEP, that it must comply with this Subpart W, the supplier must conduct standard monitoring ~~samples~~ under Section 611.921 or a system-specific study ~~samples~~ under Section 611.922.

BOARD NOTE: Derived from 40 CFR 141.604 ~~(2006)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART X: ENHANCED FILTRATION AND DISINFECTION— SYSTEMS SERVING FEWER THAN 10,000 PEOPLE

Section 611.950 General Requirements

a) The requirements of this Subpart X constitute national primary drinking water regulations. These regulations establish requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required under Subpart B. The regulations in this Subpart X establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: Giardia lamblia, viruses, heterotrophic plate count bacteria, Legionella, Cryptosporidium, and turbidity. The treatment technique requirements consist of installing and properly operating water treatment processes that reliably achieve the following:

1) At least 99 percent (2-log) removal of Cryptosporidium between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems, or Cryptosporidium control under the watershed control plan for unfiltered systems; and

2) Compliance with the profiling and benchmark requirements in Sections 611.953 and 611.954.

b) Applicability of the Subpart X Requirements ~~requirements~~. A supplier is subject to these requirements if the following is true of its system:

1) Is a public water system;

2) Uses surface water or groundwater under the direct influence of surface water as a source; and

3) Serves fewer than 10,000 persons.

c) This subsection (c) corresponds with 40 CFR 141.502, which includes a past implementation date. This statement maintains structural consistency with the corresponding federal provision.

d) Subpart X Requirements ~~requirements~~. There are seven requirements of this Subpart X, and a supplier must comply with all requirements that are applicable to its system. These requirements are the following:

1) The supplier must cover any finished water reservoir that the supplier began to construct on or after March 15, 2002, as described in Section 611.951;

2) If the supplier's system is an unfiltered system, the supplier must comply with the updated watershed control requirements described in Section 611.952;

3) If the supplier's system is a community or non-transient non-community water system the supplier must develop a disinfection profile, as described in Section 611.953;

4) If the supplier's system is considering making a significant change to its disinfection practices, the supplier must develop a disinfection benchmark and consult with the Agency for approval of the change, as described in Section 611.954;

5) If the supplier's system is a filtered system, the supplier must comply with the combined filter effluent requirements, as described in Section 611.955;

6) If the supplier's system is a filtered system that uses conventional or direct filtration, the supplier must comply with the individual filter turbidity requirements, as described in Section 611.956; and

7) The supplier must comply with the applicable reporting and recordkeeping requirements, as described in Section 611.957.

BOARD NOTE: Derived from 40 CFR 141.500 through 141.503 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.952 Additional Watershed Control Requirements for Unfiltered Systems

a) Applicability. A Subpart B system supplier that serves fewer than 10,000 persons that does not provide filtration must continue to comply with all of the filtration avoidance criteria in Sections 611.211 and 611.230 through 611.233, as well as the additional watershed control requirements in subsection (b).

b) Requirements to Avoid Filtration ~~avoid filtration~~. A supplier must take any additional steps necessary to minimize the potential for contamination by Cryptosporidium oocysts in the source water. A watershed control program must fulfill the following for Cryptosporidium:

1) The program must identify watershed characteristics and activities that may have an adverse effect on source water quality; and

2) The program must monitor the occurrence of activities that may have an adverse effect on source water quality.

c) Determination of Adequacy ~~adequacy~~ of Control Requirements ~~control requirements~~. During an onsite inspection conducted under the provisions of Section 611.232(c), the Agency must determine whether a watershed control program is adequate to limit potential contamination by Cryptosporidium oocysts. The adequacy of the program must be based on the comprehensiveness of the watershed review; the effectiveness of the program to monitor and control detrimental activities occurring in the watershed; and the extent to which the supplier has maximized land ownership or controlled land use within the watershed.

BOARD NOTE: Derived from 40 CFR 141.520 through 141.522 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.953 Disinfection Profile

a) Applicability. A disinfection profile is a graphical representation of a system's level of Giardia lamblia or virus inactivation measured during the course of a year. A Subpart B community or non-transient non-community water system that serves fewer than 10,000 persons must develop a disinfection profile unless the Agency, by a SEP, determines that a profile is unnecessary. The Agency may approve the use of a more representative data set for disinfection profiling than the data set required under subsections (c) through (g).

b) Determination That ~~that~~ a Disinfection Profile Is Not Necessary ~~disinfection profile is not necessary~~. The Agency may only determine that a disinfection profile is not necessary if the system's TTHM and HAA5 levels are below 0.064 mg/ℓ and 0.048 mg/ℓ, respectively. To determine these levels, TTHM and HAA5 samples must have been collected during the month with the warmest water temperature, and at the point of maximum residence time in the distribution system. The Agency may, by a SEP, approve the use of a different data set to determine these levels if it determines that the data set is representative TTHM and HAA5 data.

c) Development of a Disinfection Profile ~~disinfection profile~~. A disinfection profile consists of the following three steps:

1) First, the supplier must collect data for several parameters from the plant, as discussed in subsection (d), over the course of 12 months;

2) Second, the supplier must use this data to calculate weekly log inactivation as discussed in subsections (e) and (f); and

3) Third, the supplier must use these weekly log inactivations to develop a disinfection profile as specified in subsection (g).

d) Data Required ~~required~~ for a Disinfection Profile ~~disinfection profile~~. A supplier must monitor the following parameters to determine the total log inactivation using the analytical methods in Section 611.531, once per week on the same calendar day, over 12 consecutive months:

1) The temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

2) If a supplier uses chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow;

3) The disinfectant contact times ("T") during peak hourly flow; and

4) The residual disinfectant concentrations ("C") of the water before or at the first customer and prior to each additional point of disinfection during peak hourly flow.

e) Calculations Based ~~based~~ on the Data Collected ~~data collected~~. The tables in Appendix B must be used to determine the appropriate $CT_{99.9}$ value. The supplier must calculate the total inactivation ratio as follows, and multiply the value by 3.0 to determine log inactivation of Giardia lamblia:

1) If the supplier uses only one point of disinfectant application, it must determine either of the following:

A) One inactivation ratio ($CT_{calc}/CT_{99.9}$) before or at the first customer during peak hourly flow; or

B) Successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the supplier must calculate the total inactivation ratio by determining $CT_{calc}/CT_{99.9}$ for each sequence and then adding the $CT_{calc}/CT_{99.9}$ values together to determine $\sum CT_{calc}/CT_{99.9}$.

2) If the supplier uses more than one point of disinfectant application before the first customer, it must determine the $CT_{calc}/CT_{99.9}$ value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow using the procedure specified in subsection (e)(1)(B).

f) Use of Chloramines, Ozone, ~~chloramines, ozone,~~ or Chlorine Dioxide ~~chlorine dioxide~~ as a Primary Disinfectant ~~primary disinfectant~~. If a supplier uses chloramines, ozone, or chlorine dioxide for primary disinfection, the supplier must also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using methods approved by the Agency.

g) Development and Maintenance ~~maintenance~~ of the Disinfection Profile ~~disinfection profile~~ in Graphic Form ~~graphic form~~. Each log inactivation serves as a data point in the supplier's disinfection profile. A supplier will have obtained 52 measurements (one for every week of the year). This will allow the supplier and the Agency the opportunity to evaluate how microbial inactivation varied over the course of the year by looking at all 52 measurements (the supplier's disinfection profile). The supplier must retain the disinfection profile data in graphic form, such as a spreadsheet, which must be available for review by the Agency as part of a sanitary survey. The supplier must use this data to calculate a benchmark if the supplier is considering changes to disinfection practices.

BOARD NOTE: Derived from 40 CFR 141.530 through 141.536 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.954 Disinfection Benchmark

a) Applicability. A Subpart B system supplier that is required to develop a disinfection profile under Section 611.953 must develop a disinfection benchmark if it decides to make a significant change to its disinfection practice. The supplier must consult with the Agency for approval before it can implement a significant disinfection practice change.

b) Significant Changes ~~changes~~ to Disinfection Practice ~~disinfection practice~~. Significant changes to disinfection practice include the following:

1) Changes to the point of disinfection;

2) Changes to the disinfectants used in the treatment plant;

3) Changes to the disinfection process; or

4) Any other modification identified by the Agency.

c) Considering a Significant Change ~~significant change~~. A supplier that is considering a significant change to its disinfection practice must calculate disinfection benchmark, as described in subsections (d) and (e), and provide the benchmarks to the Agency. A supplier may only make a significant disinfection practice change after consulting with the Agency for approval. A supplier must submit the following information to the Agency as part of the consultation and approval process:

1) A description of the proposed change;

2) The disinfection profile for Giardia lamblia (and, if necessary, viruses) and disinfection benchmark;

3) An analysis of how the proposed change will affect the current levels of disinfection; and

4) Any additional information requested by the Agency.

d) Calculation of a Disinfection Benchmark ~~disinfection benchmark~~. A supplier that is making a significant change to its disinfection practice must calculate a disinfection benchmark using the following procedure:

1) Step 1: Using the data that the supplier collected to develop the disinfection profile, determined the average Giardia lamblia inactivation for each calendar month by dividing the sum of all Giardia lamblia inactivations for that month by the number of values calculated for that month; and

2) Step 2: Determine the lowest monthly average value out of the 12 values. This value becomes the disinfection benchmark.

e) If a supplier uses chloramines, ozone or chlorine dioxide for primary disinfection the supplier must calculate the disinfection benchmark from the data that the supplier collected for viruses to develop the disinfection profile in subsection (d). This viral benchmark must be calculated in the same manner used to calculate the Giardia lamblia disinfection benchmark in subsection (d).

BOARD NOTE: Derived from 40 CFR 141.540 through 141.544 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.955 Combined Filter Effluent Turbidity Limits

a) Applicability. A Subpart B system supplier that serves fewer than 10,000 persons, which is required to filter, and which utilizes filtration other than slow sand filtration or diatomaceous earth filtration must meet the combined filter effluent turbidity requirements of subsections (b) through (d) . If the supplier uses slow sand or diatomaceous earth filtration the supplier is not required to meet the combined filter effluent turbidity limits of this Subpart X, but the supplier must continue to meet the combined filter effluent turbidity limits in Section 611.250.

b) Combined Filter Effluent Turbidity Limits ~~filter effluent turbidity limits~~. A supplier must meet two strengthened combined filter effluent turbidity limits.

1) The first combined filter effluent turbidity limit is a "95th percentile" turbidity limit that a supplier must meet in at least 95 percent of the turbidity measurements taken each month. Measurements must continue to be taken as described in Sections 611.531 and 611.533. Monthly reporting must be completed according to Section 611.957(a). The following are the required limits for specific filtration technologies:

A) For a system with conventional filtration or direct filtration, the 95th percentile turbidity value is 0.3 NTU.

B) For a system with any other alternative filter technology, the 95th percentile turbidity value is a value (not to exceed 1 NTU) to be determined by the Agency, by a SEP, based on the demonstration described in subsection (c).

2) The second combined filter effluent turbidity limit is a "maximum" turbidity limit that a supplier may at no time exceed during the month. Measurements must continue to be taken as described in Sections 611.531 and 611.533. Monthly reporting must be completed according to Section 611.957(a). The following are the required limits for specific filtration technologies:

A) For a system with conventional filtration or direct filtration, the maximum turbidity value is 1 NTU.

B) For a system with any other alternative filter technology, the maximum turbidity value is a value (not to exceed 5 NTU) to be determined by the Agency, by a SEP, based on the demonstration described in subsection (c).

c) Requirements for an Alternative Filtration System ~~alternative filtration system.~~

1) If a supplier's system consists of alternative filtration (filtration other than slow sand filtration, diatomaceous earth filtration, conventional filtration, or direct filtration) the supplier is required to conduct a demonstration (see tables in subsection (b)). The supplier must demonstrate to the Agency, using pilot plant studies or other means, that its system's filtration, in combination with disinfection treatment, consistently achieves the following:

A) 99 percent removal of Cryptosporidium oocysts;

B) 99.9 percent removal or inactivation of Giardia lamblia cysts; and

C) 99.99 percent removal or inactivation of viruses.

2) This subsection (c)(2) corresponds with 40 CFR 141.552(b), which USEPA has designated as "reserved". This statement maintains structural correspondence with the corresponding federal regulation.

d) Requirements for a Lime-Softening System ~~lime-softening system~~. If a supplier practices lime softening, the supplier may acidify representative combined filter effluent turbidity samples prior to analysis using a protocol approved by the Agency.

BOARD NOTE: Derived from 40 CFR 141.550 through 141.553 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.956 Individual Filter Turbidity Requirements

a) Applicability. A Subpart B system supplier that serves fewer than 10,000 persons and utilizing conventional filtration or direct filtration must conduct continuous monitoring of turbidity for each individual filter in a supplier's system. The following requirements apply to continuous turbidity monitoring:

1) Monitoring must be conducted using an approved method in Section 611.531;

2) Calibration of turbidimeters must be conducted using procedures specified by the manufacturer;

3) Results of turbidity monitoring must be recorded at least every 15 minutes;

4) Monthly reporting must be completed according to Section 611.957(a); and

5) Records must be maintained according to Section 611.957(b).

b) Failure of Turbidity Monitoring Equipment ~~turbidity monitoring equipment~~. If there is a failure in the continuous turbidity monitoring equipment, the supplier must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is back on-line. The supplier has 14 days to resume continuous monitoring before a violation is incurred.

c) Special Requirements ~~requirements~~ for Systems ~~systems~~ with Two ~~two~~ or Fewer Filters ~~fewer filters~~. If a supplier's system only consists of two or fewer filters, the supplier may conduct continuous monitoring of combined filter effluent turbidity in lieu of individual filter effluent turbidity monitoring. Continuous monitoring must meet the same requirements set forth in subsections (a)(1) through (a)(4) and (b).

d) Follow-Up Action~~Follow-up action~~. Follow-up action is required according to the following requirements:

1) If the turbidity of an individual filter (or the turbidity of combined filter effluent (CFE) for a system with two filters that monitor CFE in lieu of individual filters) exceeds 1.0 NTU in two consecutive recordings 15 minutes apart, the supplier must report to the Agency by the 10th of the following month and include the filter numbers, corresponding dates, turbidity values that exceeded 1.0 NTU, and the cause (if known) for the exceedances.

2) If a supplier was required to report to the Agency for three months in a row and turbidity exceeded 1.0 NTU in two consecutive recordings 15 minutes apart at the same filter (or CFE for systems with two filters that

monitor CFE in lieu of individual filters), the supplier must conduct a self-assessment of the filters within 14 days after the day on which the filter exceeded 1.0 NTU in two consecutive measurements for the third straight month, unless a CPE, as specified in subsection (d)(3), was required. A supplier that has a system with two filters that monitor CFE in lieu of individual filters must conduct a self-assessment on both filters. The self-assessment must consist of at least the following components: assessment of filter performance, development of a filter profile, identification and prioritization of factors limiting filter performance, assessment of the applicability of corrections, and preparation of a filter self-assessment report.

3) If a supplier was required to report to the Agency for two months in a row and turbidity exceeded 2.0 NTU in two consecutive recordings 15 minutes apart at the same filter (or CFE for systems with two filters that monitor CFE in lieu of individual filters), the supplier must arrange to have a comprehensive performance evaluation (CPE) conducted by the Agency or a third party approved by the Agency not later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month. If a CPE has been completed by the Agency or a third party approved by the Agency within the 12 prior months or the system and Agency are jointly participating in an ongoing comprehensive technical assistance (CTA) project at the system, a new CPE is not required. If conducted, a CPE must be completed and submitted to the Agency no later than 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

e) Special Individual Filter Monitoring ~~individual filter monitoring~~ for a Lime-Softening System ~~lime-softening system~~. If a supplier's system utilizes lime softening, the supplier may apply to the Agency for alternative turbidity exceedance levels for the levels specified in subsection (d). The supplier must be able to demonstrate to the Agency that higher turbidity levels are due to lime carryover only, and not due to degraded filter performance.

BOARD NOTE: Derived from 40 CFR 141.560 through 141.564 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART Y: STAGE 2 DISINFECTION BYPRODUCTS REQUIREMENTS

Section 611.970 General Requirements

a) General. The requirements of this Subpart Y constitute NPDWRs. The regulations in this Subpart Y establish monitoring and other requirements for achieving compliance with MCLs based on LRAAs for TTHM and HAA5, and for achieving compliance with MRDLs for chlorine and chloramine for certain consecutive systems.

b) Applicability. A supplier is subject to these requirements if its system is a CWS or a NTNCWS that uses a primary or residual disinfectant other than ultraviolet light or which delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

c) A supplier must comply with the requirements in this Subpart Y as follows:

1) The supplier's monitoring frequency is specified in Section 611.971(a)(2).

A) If a supplier is required to conduct quarterly monitoring, it must begin monitoring in the first full calendar quarter that includes the applicable compliance date set forth in this subsection (c).

B) If a supplier is required to conduct monitoring less frequently than quarterly, it must begin monitoring in the calendar month recommended in the IDSE report prepared under ~~pursuant to~~ Section 611.921 or Section 611.922 or in the calendar month identified in the Subpart Y monitoring plan developed under ~~pursuant to~~ Section 611.972, but in no instance later than 12 months after the applicable compliance date set forth in this subsection (c).

2) If a supplier is required to conduct quarterly monitoring, it must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). If a supplier is required to conduct monitoring less frequently than quarterly, it must make compliance calculations beginning with the first compliance sample taken after the compliance date.

3) The Agency may, by a SEP, determine that the combined distribution system does not include certain consecutive systems based on factors such as receipt of water from a wholesale system only on an emergency basis or receipt of only a small percentage and small volume of water from a wholesale system. The Agency may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivery of water to a consecutive system only on an emergency basis or delivery of only a small percentage and small volume of water to a consecutive system.

BOARD NOTE: Implementation of this Subpart Y occurred in stages during October 1, 2012 through October 1, 2014, depending on population served. See 40 CFR 141.620(c)(1) through (c)(5). The Board removed the now-obsolete implementation dates.

d) Monitoring and Compliance ~~compliance.~~

1) Suppliers Required ~~required~~ to Monitor Quarterly ~~monitor quarterly~~. To comply with Subpart Y MCLs in Section 611.312(b)(2), the supplier must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this Subpart Y, and it must determine that each LRAA does not exceed the MCL. If the supplier fails to complete four consecutive quarters of monitoring, it must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If the supplier takes more than one sample per quarter at a monitoring location, it must average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

2) Suppliers Required ~~required~~ to Monitor Yearly ~~monitor yearly~~ or Less Frequently ~~less frequently~~. To determine compliance with Subpart Y MCLs in Section 611.312(b)(2), the supplier must determine that each sample taken is less than the MCL. If any sample exceeds the MCL, the supplier must comply with the requirements of Section 611.975. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

e) Violation for Failure ~~failure~~ to Monitor ~~monitor~~. A supplier is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if the supplier fails to monitor.

BOARD NOTE: Derived from 40 CFR 141.620 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.971 Routine Monitoring

a) Monitoring~~.~~

1) If a supplier submitted an IDSE report, it must begin monitoring at the locations and during the months that the supplier has recommended in its IDSE report submitted under Section 611.925, following the schedule set forth in Section 611.970(c), unless the Agency, by a SEP, requires other locations or additional locations after its review. If the supplier submitted a 40/30 certification under Section 611.923, it qualified for a very small system waiver under Section 611.924, or it is a NTNCWS that serves fewer than 10,000 persons, the supplier must monitor at the locations and on the dates identified in its monitoring plan as described in Section 611.382(f), updated as required by Section 611.972.

2) The supplier must monitor at no fewer than the number of locations identified in the applicable of subsections (a)(2)(A) through (a)(2)(M), subject to the limitations of subsections (a)(2)(N) and (a)(2)(O).

A) A Subpart B system supplier that serves fewer than 500 persons must monitor annually at two distribution system monitoring locations during each monitoring period.

B) A Subpart B system supplier that serves 500 to 3,300 persons must monitor quarterly at two distribution system monitoring locations during each monitoring period.

C) A Subpart B system supplier that serves 3,301 to 9,999 persons must monitor quarterly at two distribution system monitoring locations during each monitoring period.

D) A Subpart B system supplier that serves 10,000 to 49,999 persons must monitor quarterly at four distribution system monitoring locations during each monitoring period.

E) A Subpart B system supplier that serves 50,000 to 249,999 persons must monitor quarterly at eight distribution system monitoring locations during each monitoring period.

F) A Subpart B system supplier that serves 250,000 to 999,999 persons must monitor quarterly at 12 distribution system monitoring locations during each monitoring period.

G) A Subpart B system supplier that serves 1,000,000 to 4,999,999 persons must monitor quarterly at 16 distribution system monitoring locations during each monitoring period.

H) A Subpart B system supplier that serves 5,000,000 or more persons must monitor quarterly at 20 distribution system monitoring locations during each monitoring period.

I) A groundwater system supplier that serves fewer than 500 persons must monitor annually at two distribution system monitoring locations during each monitoring period.

J) A groundwater system supplier that serves 500 to 9,999 persons must monitor annually at two distribution system monitoring locations during each monitoring period.

K) A groundwater system supplier that serves 10,000 to 99,999 persons must monitor quarterly at four distribution system monitoring locations during each monitoring period.

L) A groundwater system supplier that serves 100,000 to 499,999 persons must monitor quarterly at six distribution system monitoring locations during each monitoring period.

M) A groundwater system supplier that serves 500,000 or more persons must monitor quarterly at eight distribution system monitoring locations during each monitoring period.

N) The supplier must monitor during month of highest DBP concentrations.

O) A supplier on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for a Subpart B system supplier that serves 500 to 3,300. A groundwater system supplier that serves 500 to 9,999 persons which is on annual monitoring must take dual sample sets at each monitoring location. Any other supplier that is on annual monitoring or which is a Subpart B system supplier that serves 500 to 3,300 is required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For a supplier that serves fewer than 500 people, only one location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location and month.

3) If a supplier is an undisinfected system that begins using a disinfectant other than UV light after the dates set forth in Subpart W for complying with the IDSE requirements, the supplier must consult with the Agency to identify compliance monitoring locations for this Subpart Y. The supplier must then develop a monitoring plan under Section 611.972 that includes those monitoring locations.

b) Analytical Methods ~~methods~~. A supplier must use an approved method listed in Section 611.381 for TTHM and HAA5 analyses in this Subpart Y. Analyses must be conducted by laboratories that have received certification as specified in Section 611.381.

BOARD NOTE: Derived from 40 CFR 141.621 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.972 Subpart Y Monitoring Plan

a) Development of a Monitoring Plan ~~monitoring plan.~~

1) A supplier must develop and implement a monitoring plan that it must keep on file for Agency and public review. The monitoring plan must contain the following elements, and it must be complete no later than the date when the supplier conducts its initial monitoring under this Subpart Y:

A) The monitoring locations;

B) The monitoring dates;

C) The compliance calculation procedures; and

D) The monitoring plans for any other systems in the combined distribution system if the Agency has reduced monitoring requirements under Section 611.161.

2) If the supplier was not required to submit an IDSE report under either Section 611.921 or Section 611.922, and it does not have sufficient Subpart I monitoring locations to identify the required number of Subpart Y compliance monitoring locations indicated in Section 611.925(b), the supplier must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The supplier must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If the supplier has more Subpart I monitoring locations than required for Subpart Y compliance monitoring in Section 611.925(b), it must identify which locations it will use for Subpart Y compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of Subpart Y compliance monitoring locations have been identified.

b) A Subpart B system supplier that serves more than 3,300 people must submit a copy of its monitoring plan to the Agency prior to the date it conducts its initial monitoring under this Subpart Y, unless the supplier's IDSE report submitted under Subpart W contains all the information required by this Section.

c) After consultation with the Agency regarding the need for and appropriateness of changes and issuance of a SEP that provides for the changes, a supplier may revise its monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for Agency-approved reasons. If the supplier changes monitoring locations, the supplier must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The Agency may, by a SEP, also require modifications in the supplier's monitoring plan. If a supplier is a Subpart B system supplier that serves more than 3,300 people, it must submit a copy of its modified monitoring plan to the Agency prior to the date when it is required to comply with the revised monitoring plan.

BOARD NOTE: Derived from 40 CFR 141.622 (2006).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.976 Operational Evaluation Levels

a) A supplier has exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by four to determine an average, exceeds 0.080 mg/ℓ, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by four to determine an average, exceeds 0.060 mg/ℓ.

b) Effects of Exceeding ~~exceeding~~ the Operational Evaluation Level ~~operational evaluation level.~~

1) If a supplier exceeds the operational evaluation level, the supplier must conduct an operational evaluation and submit a written report of the evaluation to the Agency no later than 90 days after being notified of the analytical result that causes it to exceed the operational evaluation level. The written report must be made available to the public upon request.

2) The supplier's operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

A) A supplier may request and the Agency may allow the supplier to limit the scope of its evaluation if the supplier is able to identify the cause of the operational evaluation level exceedance.

B) A supplier's request to limit the scope of the evaluation does not extend the schedule in subsection (b)(1) for submitting the written report. The Agency must approve this limited scope of evaluation in writing, and the supplier must keep that approval with the completed report.

BOARD NOTE: Derived from 40 CFR 141.626~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.979 Reporting and Recordkeeping Requirements

a) Reporting~~.~~

1) A supplier must report the following information to the Agency within ten ~~10~~ days after the end of any quarter in which monitoring is required for each monitoring location:

A) The number of samples taken during the last quarter;

B) The date and results of each sample taken during the last quarter;

C) The arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the supplier must report this information to the Agency as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the supplier is required to conduct monitoring at a frequency that is less than quarterly, it must make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the supplier is required to conduct increased monitoring under ~~pursuant to~~ Section 611.975;

D) A statement whether, based on Section 611.312(b)(2) and this Subpart Y, the MCL was violated at any monitoring location; and

E) Any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

2) If a supplier is a Subpart B system supplier that seeks to qualify for or remain on reduced TTHM and HAA5 monitoring, it must report the following source water TOC information for each treatment plant that treats surface water or groundwater under the direct influence of surface water to the Agency within ten ~~10~~ days after the end of any quarter in which monitoring is required:

A) The number of source water TOC samples taken each month during last quarter;

B) The date and result of each sample taken during last quarter;

C) The arithmetic average of monthly samples taken during the last quarter or the result of the quarterly sample;

D) The running annual average (RAA) of quarterly averages from the past four quarters; and

E) Whether the RAA exceeded 4.0 mg/ℓ.

3) The Agency may, by a SEP, choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information under this Section.

b) Recordkeeping. A supplier must retain any Subpart Y monitoring plans and the supplier's Subpart Y monitoring results as required by Section 611.860.

BOARD NOTE: Derived from 40 CFR 141.629 ~~(2006)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART Z: ENHANCED TREATMENT FOR CRYPTOSPORIDIUM

Section 611.1001 Source Water Monitoring Requirements: Source Water Monitoring

a) Initial Round ~~round~~ of Source Water Monitoring ~~source water monitoring~~. A supplier must conduct the following monitoring on the schedule in subsection (c), unless it meets the monitoring exemption criteria in subsection (d).

1) A filtered system supplier that serves 10,000 or more people must sample its source water for Cryptosporidium, E. coli, and turbidity at least monthly for 24 months.

2) An unfiltered system supplier that serves 10,000 or more people must sample its source water for Cryptosporidium at least monthly for 24 months.

3) Smaller System Suppliers Monitoring ~~system suppliers monitoring~~ for E. coli~~.~~

A) A filtered system supplier that serves fewer than 10,000 people must sample its source water for E. coli at least once every two weeks for 12 months.

B) A filtered system supplier that serves fewer than 10,000 people may avoid E. coli monitoring if the system notifies the Agency that it will monitor for Cryptosporidium as described in subsection (a)(4). The system must notify the Agency no later than three months prior to the date before which the system is otherwise required to start E. coli monitoring under subsection (c) ~~pursuant toSection 611.1001(c)~~.

4) Smaller System Suppliers Monitoring ~~system suppliers monitoring~~ for Cryptosporidium. A filtered system supplier that serves fewer than 10,000 people must sample its source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months if it meets any of the conditions set forth in subsections (a)(4)(A) through (a)(4)(C), subject to the limitations of subsection (a)(4)(D), based on monitoring conducted under subsection (a)(3).

A) For a supplier that uses a lake or reservoir source, the annual mean E. coli concentration is greater than 10 E. coli/100 mℓ.

B) For a supplier that uses a flowing stream source, the annual mean E. coli concentration is greater than 50 E. coli/100 mℓ ~~E. coli/ 100 mℓ~~.

C) The supplier does not conduct E. coli monitoring as described in subsection (a)(3).

D) A supplier that uses groundwater under the direct influence of surface water must comply with the requirements of subsection (a)(4) based on the E. coli level that applies to the nearest surface water body. If no surface water body is nearby, the system must comply based on the requirements that apply to a supplier that uses a lake or reservoir source.

5) For a filtered system supplier that serves fewer than 10,000 people, the Agency may, by a SEP, approve monitoring for an indicator other than E. coli under ~~pursuant to~~ subsection (a)(3). The Agency may also, by a SEP, approve an alternative to the E. coli concentration in subsection (a)(4)(A), (a)(4)(B), or (a)(4)(D) to trigger Cryptosporidium monitoring. This approval by the Agency must be provided to the supplier in writing, and it must include the basis for the Agency's determination that the alternative indicator or trigger level will provide a more accurate identification of whether a system will exceed the Bin 1 Cryptosporidium level set forth in Section 611.1010.

6) An unfiltered system supplier that serves fewer than 10,000 people must sample its source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months.

7) A supplier may sample more frequently than required by this Section if the sampling frequency is evenly spaced throughout the monitoring period.

b) Second Round ~~round~~ of Source Water Monitoring ~~source water monitoring~~. A supplier must conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in subsection (a), unless it meets the monitoring exemption criteria in subsection (d). The supplier must conduct this monitoring on the schedule set forth in subsection (c).

c) Monitoring Schedule ~~schedule~~. A supplier must perform the two rounds of monitoring required by ~~in~~ subsections (a) and (b) on the schedule provided in this subsection (c), unless the supplier meets the monitoring exemption criteria in subsection (d)~~, except that a supplier serving fewer than 10,000 persons must begin monitoring no later than the month beginning with the applicable date listed in subsections (c)(1) and (c)(2)~~.

1) Suppliers That Serve at Least 100,000 People

A) The suppliers must have begun the first round of source water monitoring no later than the end of October 2006.

B) The suppliers must have begun the second round of source water monitoring no later than the end of April 2015.

2) Suppliers That Serve from 50,000 to 99,999 People

A) The suppliers must have begun the first round of source water monitoring no later than the end of April 2007.

B) The suppliers must have begun the second round of source water monitoring no later than the end of October 2015.

3) Suppliers That Serve from 10,000 to 49,999 People

A) The suppliers must have begun the first round of source water monitoring no later than the end of April 2008.

B) The suppliers must have begun the second round of source water monitoring no later than the end of October 2016.

4) Suppliers That Serve Fewer Than 10,000 People and Which Monitor for E. coli

A) The suppliers must have begun the first round of source water monitoring no later than the end of October 2008.

B) The suppliers must have begun the second round of source water monitoring no later than the end of October 2017.

5) Suppliers That Serve Fewer Than 10,000 People and Which Monitor for Cryptosporidium

A) The suppliers must have begun the first round of source water monitoring no later than the end of April 2010.

B) The suppliers must have begun the second round of source water monitoring no later than the end of April 2019.

~~1) A supplier that serves fewer than 10,000 persons, that is a filtered system supplier, and which monitors for E. coli is required to begin the second round of source water monitoring no later than the month beginning October 1, 2017.~~

~~2) A supplier that serves fewer than 10,000 persons, that is an unfiltered system supplier, or that is a filtered system supplier which meets the conditions of subsection (a)(4), and which monitors for Cryptosporidium,~~

~~is required to begin the second round of source water monitoring no later than the month beginning April 1, 2019.~~

BOARD NOTE: ~~Implementation of the first round of monitoring for this Subpart Z occurred in stages during October 1, 2006 through October 1, 2014, depending on population served. Implementation of the second round of monitoring occurred between April 15, 2015 and April 1, 2019. See 40 CFR 141.701(c). Subsections (c)(1) and (c)(2) correspond with 40 CFR 141.701(c)(4) and (c)(5).~~ The Board retained ~~removed~~ the past implementation dates until implementation of the Long Term 2 Enhanced Surface Water Treatment Rule in this Subpart Z is complete.

d) Monitoring Avoidance ~~avoidance.~~

1) A filtered system supplier is not required to conduct source water monitoring under this Subpart Z if the system will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in Section 611.1011.

2) An unfiltered system supplier is not required to conduct source water monitoring under this Subpart Z if the system will provide a total of at least 3-log Cryptosporidium inactivation, equivalent to meeting the treatment requirements for an unfiltered system supplier with a mean Cryptosporidium concentration of greater than 0.01 oocysts/ℓ in Section 611.1012.

3) If a supplier chooses to provide the level of treatment set forth in subsection (d)(1) or (d)(2), as applicable, rather than start source water monitoring, it must notify the Agency in writing no later than the date on which the system is otherwise required to submit a sampling schedule for monitoring under Section 611.1002. Alternatively, a supplier may choose to stop sampling at any point after it has initiated monitoring if it notifies the Agency in writing that it will provide this level of treatment. The supplier must install and operate technologies to provide this level of treatment before the applicable treatment compliance date set forth in Section 611.1013.

e) Plants Operating Only Part ~~operating only part~~ of the Year ~~year~~. A supplier that has a Subpart B plant that operates for only part of the year must conduct source water monitoring in accordance with this Subpart Z, but with the following modifications:

1) The supplier must sample its source water only during the months that the plant operates, unless the Agency, by a SEP, specifies another monitoring period based on plant operating practices.

2) A supplier with plants that operate less than six months per year and which monitors for Cryptosporidium must collect at least six

Cryptosporidium samples per year during each of two years of monitoring. Samples must be evenly spaced throughout the period during which the plant operates.

f) New Sources ~~sources~~ and New Systems ~~new systems.~~

1) New sources. A supplier that begins using a new source of surface water or groundwater under the direct influence of surface water after the supplier was ~~is~~ required to begin monitoring under subsection (c) must monitor the new source on a schedule that the Agency has approved by a SEP. Source water monitoring must meet the requirements of this Subpart Z. The supplier must also meet the bin classification and Cryptosporidium treatment requirements of Sections 611.1010 and 611.1011 or Section 611.1012, as applicable, for the new source on a schedule that the Agency has approved by a SEP.

2) The requirements of Section 611.1001(f) apply to a Subpart B system supplier that begins operation after the applicable monitoring start date set forth in subsection (c).

3) The supplier must begin a second round of source water monitoring no later than six years following initial bin classification under Section 611.1010 or determination of the mean Cryptosporidium level under Section 611.1012.

g) Failure to collect any source water sample required under this Section in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements of Sections 611.1002 through 611.1006 is a monitoring violation.

h) Grandfathering Monitoring Data ~~monitoring data~~. A supplier may use (grandfather) monitoring data collected prior to the applicable monitoring start date in subsection (c) to meet the initial source water monitoring requirements in subsection (a). Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. All data submitted under this subsection must meet the requirements set forth in Section 611.1007.

BOARD NOTE: Derived from 40 CFR 141.701 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1002 Source Water Monitoring Requirements: Sampling Schedules

a) A supplier required to conduct source water monitoring under ~~pursuant to~~ Section 611.1001 must submit a sampling schedule that specifies the calendar dates on which it will collect each required sample.

1) The supplier must submit sampling schedules no later than three months prior to the applicable date listed in Section 611.1001(c) for each round of required monitoring.

2) Submission of the Sampling Schedule ~~sampling schedule~~ to USEPA~~.~~

A) A supplier that serves 10,000 or more people must submit its sampling schedule for the initial round of source water monitoring under Section 611.1001(a) to USEPA electronically into the Data Collection and Tracking System (DCTS) through USEPA's Central Data Exchange (CDX) ~~at https://intranet.epa.gov/lt2/~~.

BOARD NOTE: The supplier must register with the CDX to use the DCTS. For information see "Step-by-Step Fuide to the Data Collection and Tracking System (DCTS)", USEPA, Office of Water (4606) (document number EPA 815/B-08-001), available from the USEPA, National Center for Environmental Publications, www.epa.gov/nscep (search "815B08001"); telephone 888-890-1995; e-mail epacdx@csc.com ("Technical Support" in the subject line); or fax 301-429-3905.

B) If a supplier is unable to submit the sampling schedule into the DCTS ~~electronically~~, the supplier may use an alternative approach for submitting the sampling schedule that USEPA has approved in writing ~~approves~~.

3) A supplier that serves fewer than 10,000 people must submit to the Agency its sampling schedules for the initial round of source water monitoring Section 611.1001(a).

4) A supplier must submit to the Agency sampling schedules for the second round of source water monitoring required by Section 611.1001(b).

5) If USEPA or the Agency does not respond to a supplier regarding its sampling schedule, the supplier must sample at the reported schedule.

b) A supplier must collect samples within two days before or two days after the dates indicated in its sampling schedule (i.e., within a five-day period around the schedule date) unless one of the conditions of subsection (b)(1) or (b)(2) applies.

1) If an extreme condition or situation exists that may pose danger to the sample collector, or one that cannot be avoided and which causes the supplier to be unable to sample in the scheduled five-day period, the supplier must sample as close to the scheduled date as is feasible, unless the Agency approves an alternative sampling date by a SEP. The supplier must submit an explanation for the delayed sampling date to the Agency concurrent with the shipment of the sample to the laboratory.

2) Replacement Samples ~~samples.~~

A) If a supplier is unable to report a valid analytical result for a scheduled sampling date due to equipment failure; loss of or damage to the sample; failure to comply with the analytical method requirements, including the quality control requirements in Section 611.1004; or the failure of an approved laboratory to analyze the sample, then the supplier must collect a replacement sample.

B) The supplier must collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date, unless the supplier demonstrates that collecting a replacement sample within this time frame is not feasible or the Agency approves an alternative resampling date by a SEP. The supplier must submit an explanation for the delayed sampling date to the Agency concurrent with the shipment of the sample to the laboratory.

c) A supplier that fails to meet the criteria of subsection (b) for any source water sample required under Section 611.1001 must revise its sampling schedule to add dates for collecting all missed samples. A supplier must submit the revised schedule to the Agency for approval prior to collecting the missed samples.

BOARD NOTE: Derived from 40 CFR 141.702 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1003 Source Water Monitoring Requirements: Sampling Locations

a) A supplier required to conduct source water monitoring under ~~pursuant to~~ Section 611.1001 must collect samples for each plant that treats a surface water or groundwater under the direct influence of surface water source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the Agency may, by a SEP issued under Section 611.110, approve one set of monitoring results to be used to satisfy the requirements of Section 611.1001 for all of the plants.

b) Source Water Sampling ~~water sampling.~~

1) A supplier must collect source water samples prior to chemical treatment, such as coagulants, oxidants, and disinfectants, unless the supplier meets the condition of subsection (b)(2).

2) The Agency may, by a SEP, approve a supplier to collect a source water sample after chemical treatment. To grant this approval, the Agency must determine that collecting a sample prior to chemical treatment is not feasible for the supplier and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

c) A supplier that recycles filter backwash water must collect source water samples prior to the point of filter backwash water addition.

d) Bank Filtration ~~filtration.~~

1) A supplier that receives Cryptosporidium treatment credit for bank filtration under Section 611.743(b) or Section 611.955(c)(1), as applicable, must collect source water samples in the surface water prior to bank filtration.

2) A supplier that uses bank filtration as pretreatment to a filtration plant must collect source water samples from the well (i.e., after bank filtration). The use of bank filtration during monitoring must be consistent with routine operational practice. A supplier collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under Section 611.1017(c).

e) Multiple Sources ~~sources~~. A supplier with plants that use multiple water sources, including multiple surface water sources and blended surface water and groundwater sources, must collect samples as specified in subsection (e)(1) or (e)(2). The use of multiple sources during monitoring must be consistent with routine operational practice.

1) If a sampling tap is available where the sources are combined prior to treatment, the supplier must collect samples from the tap.

2) If a sampling tap where the sources are combined prior to treatment is not available, the supplier must collect samples at each source near the intake on the same day, and it must follow either of the following procedures for sample analysis:

A) The supplier may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected; or

B) The supplier may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

f) Additional Requirements. A supplier must submit a description of its sampling locations to the Agency at the same time as the sampling schedule required under Section 611.1002. This description must address the position of the sampling location in relation to the supplier's water sources and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle.

If the Agency does not respond to a supplier regarding sampling locations, the supplier must sample at the reported locations.

BOARD NOTE: Derived from 40 CFR 141.703 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1004 Source Water Monitoring Requirements: Analytical Methods

a) Cryptosporidium. A supplier must analyze for Cryptosporidium using USEPA ~~OGWDW Methods, Method~~ 1623 (05), USEPA 1623.1 (12), or USEPA 1622 (05), each incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480.

1) The supplier must analyze at least a 10 ℓ sample or a packed pellet volume of at least 2 mℓ as generated by the methods listed in subsection (a). A supplier unable to process a 10 ℓ sample must analyze as much sample volume as can be filtered by two filters approved by USEPA for the methods listed in subsection (a), up to a packed pellet volume of at least 2 mℓ.

2) Matrix Spike ~~spike~~ (MS) Samples ~~samples.~~

A) MS samples, as required by the methods in subsection (a), must be spiked and filtered by a laboratory approved for Cryptosporidium analysis under Section 611.1005.

B) If the volume of the MS sample is greater than 10 ℓ, the supplier may filter all but 10 ℓ of the MS sample in the field, and ship the filtered sample and the remaining 10 ℓ of source water to the laboratory. In this case, the laboratory must spike the remaining 10 ℓ of water and filter it through the filter used to collect the balance of the sample in the field.

3) Flow cytometer-counted spiking suspensions must be used for MS samples and ongoing precision and recovery samples.

b) E. coli. A supplier must use methods for enumeration of E. coli in source water approved in 40 CFR 136.3(a), incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480.

1) The time from sample collection to initiation of analysis may not exceed 30 hours, unless the supplier meets the condition of subsection (b)(2).

2) The Agency may, by a SEP, approve on a case-by-case basis the holding of an E. coli sample for up to 48 hours between sample collection and initiation of analysis if it determines that analyzing an E. coli sample within 30 hours is not feasible. E. coli samples held between 30 to 48

hours must be analyzed by the Colilert® Test reagent version of SM ~~Standard Methods, 18th, 19th, or 20th ed., Method~~ 9223 B listed in 40 CFR 136.3(a), incorporated by reference in Section 611.102.

3) A supplier must maintain the temperature of its samples between 0 ºC ~~0ºC~~ and 10 ºC ~~10ºC~~ during storage and transit to the laboratory.

4) The supplier may use the membrane filtration, two-step procedure described in SM ~~Standard Methods, 20th ed., Method~~ 9222 D (97) (20th ed. only) and SM 9222 G (97) (20th ed. only), incorporated by reference in Section 611.102.

~~BOARD NOTE: USEPA added Standard Methods, 20th ed., Method 9222 D and G on June 3, 2008 (at 73 Fed. Reg. 31616).~~

c) Turbidity. A supplier must use methods for turbidity measurement approved in Section 611.531(a).

BOARD NOTE: Derived from 40 CFR 141.704 and appendix A to subpart C of 40 CFR 141 ~~(2016)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Methods 9222 D-97 and 9222 G-97 appear in the 20th and 21st editions as Methods 9222 D and 9222 G, but USEPA approved the method in the 20th edition only. In this Section, these appear as SM 9222 D (97) and SM 9222 G (97).

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1006 Source Water Monitoring Requirements: Reporting Source Water Monitoring Results

a) A supplier must report results from the source water monitoring required under ~~pursuant to~~ Section 611.1001 no later than ten ~~10~~ days after the end of the first month following the month when the sample is collected.

b) Submission of Analytical Results ~~analytical results~~ to USEPA~~.~~

1) A supplier that serves at least 10,000 people must report the results from the initial source water monitoring required under ~~pursuant to~~ Section 611.1001(a) to the Data Collection and Tracking System (DCTS) through USEPA's Central Data Exchange (CDX) ~~USEPA electronically at https://intranet.epa.gov/lt2/~~.

BOARD NOTE: The supplier must register with the CDX to use the DCTS. For information see "Step-by-Step Fuide to the Data Collection and Tracking System (DCTS)", USEPA, Office of Water (4606) (document number EPA 815/B-08-001), available from the USEPA, National Center for Environmental Publications, www.epa.gov/nscep (search “815B08001”); telephone 888-890-1995; e-mail epacdx@csc.com (“Technical Support” in the subject line); or fax 301-429-3905.

2) If a supplier is unable to report monitoring results into the DCTS ~~electronically~~, the supplier may use an alternative approach for reporting monitoring results that USEPA has approved in writing ~~approves~~.

c) A supplier that serves fewer than 10,000 people must report results from the initial source water monitoring required under ~~pursuant to~~ Section 611.1001(a) to the Agency.

d) A supplier must report results from the second round of source water monitoring required under ~~pursuant to~~ Section 611.1001(b) to the Agency.

e) A supplier must report the applicable information in subsections (e)(1) and (e)(2) for the source water monitoring required under ~~pursuant to~~ Section 611.1001.

1) A supplier must report the data elements set forth in subsection (e)(1)(D) for each Cryptosporidium analysis.

A) For matrix spike samples, a supplier must also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

B) For samples in which less than 10 ℓ is filtered or less than 100% of the sample volume is examined, the supplier must also report the number of filters used and the packed pellet volume.

C) For samples in which less than 100% of sample volume is examined, the supplier must also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

D) Data Elements ~~elements.~~

i) The PWS ID;

ii) The Facility ID;

iii) The sample collection date;

iv) The sample type (field or matrix spike);

v) The sample volume filtered (ℓ), to nearest 1⁄4 ℓ;

vi) Whether 100 percent of the filtered volume was examined; and

vii) The number of oocysts counted.

BOARD NOTE: Subsection (e)(1)(D) is derived from unnumbered tabulated text in 40 CFR 141.706(e)(1)~~ (2006)~~.

2) A supplier must report the following data elements for each E. coli analysis:

A) The PWS ID;

B) The Facility ID;

C) The sample collection date;

D) The analytical method number;

E) The method type;

F) The source type (flowing stream, lake or reservoir, groundwater under the direct influence of surface water);

G) The E. coli count per 100 mℓ.

H) The turbidity, except that a supplier which serves fewer than 10,000 people that is not required to monitor for turbidity under ~~pursuant to~~ Section 611.1001 is not required to report turbidity with its E. coli results.

BOARD NOTE: Derived from 40 CFR 141.706~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1007 Source Water Monitoring Requirements: Grandfathering Previously Collected Data

a) Initial Source Monitoring ~~source monitoring~~ and Cryptosporidium Samples ~~samples.~~

1) A supplier may comply with the initial source water monitoring requirements of Section 611.1001(a) by grandfathering sample results collected before the supplier is required to begin monitoring (i.e., previously collected data). To be grandfathered, the sample results and analysis must meet the criteria in this Section and the Agency must approve the use of the data by a SEP.

2) A filtered system supplier may grandfather Cryptosporidium samples to meet the requirements of Section 611.1001(a) when the supplier does not have corresponding E. coli and turbidity samples. A supplier that grandfathers Cryptosporidium samples without E. coli and turbidity

samples is not required to collect E. coli and turbidity samples when it completes the requirements for Cryptosporidium monitoring under Section 611.1001(a).

b) E. coli Sample Analysis ~~sample analysis~~. The analysis of E. coli samples must meet the analytical method and approved laboratory requirements of Sections 611.1004 and 611.1005.

c) Cryptosporidium Sample Analysis ~~sample analysis~~. The analysis of Cryptosporidium samples must meet the criteria in this subsection (c).

1) Laboratories must analyze Cryptosporidium samples using one of the following filtration. immunomagnetic separation, and immunofluorescence assay analytical methods, incorporated by reference in Section 611.102, or alternative methods approved by the Agency under Section 611.480:

A) USEPA ~~OGWDW Methods, Method~~ 1623 (05);

B) USEPA ~~OGWDW Methods, Method~~ 1622 (05);

C) USEPA ~~OGWDW Methods, Method~~ 1623 (01);

D) USEPA ~~OGWDW Methods, Method~~ 1622 (01); or

E) USEPA ~~OGWDW Methods, Method~~ 1623 (99)a~~; or~~

~~F) USEPA OGWDW Methods, Method 1622 (99).~~

2) For each Cryptosporidium sample, the laboratory analyzed at least 10 ℓ of sample or at least 2 mℓ of packed pellet or as much volume as could be filtered by two filters that USEPA approved for the methods listed in subsection (c)(1).

d) Sampling Location ~~location~~. The sampling location must meet the conditions in Section 611.1003.

e) Sampling Frequency ~~frequency~~. Cryptosporidium samples were collected no less frequently than each calendar month on a regular schedule, beginning no earlier than January 1999. Sample collection intervals may vary for the conditions specified in Section 611.1002(b)(1) and (b)(2) if the supplier provides documentation of the condition when reporting monitoring results.

1) The Agency may, by a SEP, approve grandfathering of previously collected data where there are time gaps in the sampling frequency if the supplier conducts additional monitoring that the Agency has specified by a SEP to ensure that the data used to comply with the initial source water

monitoring requirements of Section 611.1001(a) are seasonally representative and unbiased.

2) A supplier may grandfather previously collected data where the sampling frequency within each month varied. If the Cryptosporidium sampling frequency varied, the supplier must follow the monthly averaging procedure in Section 611.1010(b)(5) or Section 611.1012(a)(3), as applicable, when calculating the bin classification for a filtered system supplier or the mean Cryptosporidium concentration for an unfiltered system supplier.

f) Reporting Monitoring Results ~~monitoring results~~ for Grandfathering ~~grandfathering~~. A supplier that requests to grandfather previously collected monitoring results must report the following information by the applicable dates listed in this subsection. A supplier must report this information to the Agency.

1) A supplier must report that it intends to submit previously collected monitoring results for grandfathering. This report must specify the number of previously collected results the supplier will submit, the dates of the first and last sample, and whether a supplier will conduct additional source water monitoring to meet the requirements of Section 611.1001(a). The supplier must report this information no later than the applicable date set forth in Section 611.1002.

2) A supplier must report previously collected monitoring results for grandfathering, along with the associated documentation listed in subsections (f)(2)(A) through (f)(2)(D), no later than two months after the applicable date listed in Section 611.1001(c).

A) For each sample result, a supplier must report the applicable data elements in Section 611.1006.

B) A supplier must certify that the reported monitoring results include all results that it generated during the time period beginning with the first reported result and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under this Subpart Z, which were not spiked, and which were analyzed using the laboratory's routine process for the analytical methods listed in this Section.

C) The supplier must certify that the samples were representative of a plant's source waters and the source waters have not changed. It must report a description of the sampling locations, which must address the position of the sampling location in relation to its water sources and treatment processes, including points of chemical addition and filter backwash recycle.

D) For Cryptosporidium samples, the laboratory or laboratories that analyzed the samples must provide a letter certifying that the quality control criteria specified in the methods listed in subsection (c)(1) were met for each sample batch associated with the reported results. Alternatively, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, initial precision and recovery, ongoing precision and recovery, and method blank sample associated with the reported results.

g) If the Agency determines that a previously collected data set submitted for grandfathering was generated during source water conditions that were not normal for the supplier, such as a drought, the Agency may, by a SEP, disapprove the data. Alternatively, the Agency may, by a SEP, approve the previously collected data if the supplier reports additional source water monitoring data, as determined by the Agency, to ensure that the data set used under Section 611.1010 or Section 611.1012 represents average source water conditions for the supplier.

h) If a supplier submits previously collected data that fully meet the number of samples required for initial source water monitoring under Section 611.1001(a), and some of the data are rejected due to not meeting the requirements of this Section, the supplier must conduct additional monitoring to replace rejected data on a schedule that the Agency has approved by a SEP. A supplier is not required to begin this additional monitoring until two months after notification that data have been rejected and additional monitoring is necessary.

BOARD NOTE: Derived from 40 CFR 141.707 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1010 Treatment Technique Requirements: Bin Classification for Filtered Suppliers

a) Following completion of the initial round of source water monitoring required under ~~pursuant to~~ Section 611.1001(a), a filtered system supplier must calculate an initial Cryptosporidium bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the Cryptosporidium results reported under ~~pursuant to~~ Section 611.1001(a) and must follow the appropriate of the procedures set forth in subsection (b).

b) Bin Concentration Calculation Procedures ~~concentration calculation procedures.~~

1) For a supplier that collects a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

2) For a supplier that collects a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which Cryptosporidium samples were collected.

3) For a supplier that serves fewer than 10,000 people and which monitors for Cryptosporidium for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

4) For a supplier with plants operating only part of the year that monitors fewer than 12 months per year under ~~pursuant to~~ Section 611.1001(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of Cryptosporidium monitoring.

5) If the monthly Cryptosporidium sampling frequency varies, a supplier must first calculate a monthly average for each month of monitoring. A supplier must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in subsections (b)(1) through (b)(4).

c) A filtered system supplier must determine its initial bin classification according to subsections (c)(1) through (c)(5), subject to the limitations of subsection (c)(6), and using the Cryptosporidium bin concentration calculated under ~~pursuant to~~ subsections (a) and (b).

1) For a supplier that is required to monitor for Cryptosporidium under ~~pursuant to~~ Section 611.1001 and which has a Cryptosporidium bin concentration of less than 0.075 oocysts/ℓ, the bin classification is Bin 1.

2) For a supplier that is required to monitor for Cryptosporidium under ~~pursuant to~~ Section 611.1001 and which has a Cryptosporidium bin concentration of 0.075 oocysts/ℓ or more, but less than 1.0 oocysts/ℓ, the bin classification is Bin 2.

3) For a supplier that is required to monitor for Cryptosporidium under ~~pursuant to~~ Section 611.1001 and which has a Cryptosporidium bin concentration of 1.0 oocysts/ℓ or more, but less than 3.0 oocysts/ℓ, the bin classification is Bin 3.

4) For a supplier that is required to monitor for Cryptosporidium under ~~pursuant to~~ Section 611.1001 and which has a Cryptosporidium bin concentration of 3.0 oocysts/ℓ or more, the bin classification is Bin 4.

5) For a supplier that that serves fewer than 10,000 people and which is not required to monitor for Cryptosporidium under ~~pursuant to~~ Section 611.1001(a)(4), the bin classification is Bin 1.

6) The Cryptosporidium concentration is based on the applicable of the calculations set forth in subsection (a) or (d).

d) Following completion of the second round of source water monitoring required under ~~pursuant to~~ Section 611.1001(b), a filtered system supplier must recalculate its Cryptosporidium bin concentration using the Cryptosporidium results reported under ~~pursuant to~~ Section 611.1001(b) and following the applicable of the procedures set forth in subsections (b)(1) through (b)(4). A supplier must then redetermine its bin classification using this bin concentration and subsection (c).

e) Reporting the Bin Classification ~~bin classification.~~

1) A filtered system supplier must report its initial bin classification under ~~pursuant to~~ subsection (c) to the Agency for approval no later than six months after the supplier is required to complete initial source water monitoring based on the applicable schedule set forth in Section 611.1001(c).

2) A supplier must report its bin classification under ~~pursuant to~~ subsection (d) to the Agency for approval no later than six months after the supplier is required to complete the second round of source water monitoring based on the applicable schedule set forth in Section 611.1001(c).

3) The bin classification report to the Agency must include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

f) A failure to comply with the conditions of subsection (e) is a violation of the treatment technique requirement.

BOARD NOTE: Derived from 40 CFR 141.710 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1011 Treatment Technique Requirements: Filtered System Additional Cryptosporidium Treatment Requirements

a) A filtered system supplier must provide the level of additional treatment for Cryptosporidium specified in subsections (a)(1) through (a)(4) based on its bin classification, as determined under Section 611.1010, and according to the applicable schedule set forth in Section 611.1013.

1) If the supplier’s bin classification is Bin 1, and the supplier uses conventional filtration treatment (including softening) in full compliance with the applicable provisions of Subparts B, R, and X, no additional treatment is required.

2) If the supplier’s bin classification is Bin 2, and the supplier uses conventional filtration treatment (including softening) in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 1-log treatment.

3) If the supplier's bin classification is Bin 2, and the supplier uses direct filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 1.5-log treatment.

4) If the supplier's bin classification is Bin 2, and the supplier uses slow sand or diatomaceous earth filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 1-log treatment.

5) If the supplier's bin classification is Bin 2, and the supplier uses alternative filtration technologies in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are as determined by the Agency, by a SEP issued under Section 611.110, such that the total Cryptosporidium removal and inactivation is at least 4.0-log.

6) If the supplier's bin classification is Bin 3, and the supplier uses conventional filtration treatment (including softening) in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 2-log treatment.

7) If the supplier's bin classification is Bin 3, and the supplier uses direct filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 2.5-log treatment.

8) If the supplier's bin classification is Bin 3, and the supplier uses slow sand or diatomaceous earth filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 2-log treatment.

9) If the supplier's bin classification is Bin 3, and the supplier uses alternative filtration technologies in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are as determined by the Agency, by a SEP, such that the total Cryptosporidium removal and inactivation is at least 5.0-log.

10) If the supplier's bin classification is Bin 4, and the supplier uses conventional filtration treatment (including softening) in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 2.5-log treatment.

11) If the supplier's bin classification is Bin 4, and the supplier uses direct filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 3-log treatment.

12) If the supplier's bin classification is Bin 4, and the supplier uses slow sand or diatomaceous earth filtration in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are a 2.5-log treatment.

13) If the supplier's bin classification is Bin 4, and the supplier uses alternative filtration technologies in full compliance with the applicable provisions of Subparts B, R, and X, then the additional Cryptosporidium treatment requirements are as determined by the Agency, by a SEP, such that the total Cryptosporidium removal and inactivation is at least 5.5-log.

b) Required Treatment ~~treatment.~~

1) A filtered system supplier must use one or more of the treatment and management options listed in Section 611.1015, termed the microbial toolbox, to comply with the additional Cryptosporidium treatment required in subsection (a).

2) A supplier classified in Bin 3 or Bin 4 must achieve at least 1-log of the additional Cryptosporidium treatment required under subsection (a) using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in Sections 611.1016 through 611.1020.

c) A failure by a supplier in any month to achieve treatment credit by meeting criteria in Sections 611.1016 through 611.1020 for microbial toolbox options that is at least equal to the level of treatment required in subsection (a) is a violation of the treatment technique requirement.

d) If the Agency determines, by a SEP, during a sanitary survey or an equivalent source water assessment that after a supplier completed the monitoring conducted under Section 611.1001(a) or 611.1001(b), significant changes occurred in the supplier's watershed that could lead to increased contamination of the source water by Cryptosporidium, the supplier must take actions specified by the Agency in the SEP to address the contamination. These actions may include additional source water monitoring or implementing microbial toolbox options listed in Section 611.1015.

BOARD NOTE: Derived from 40 CFR 141.711 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1012 Treatment Technique Requirements: Unfiltered System Cryptosporidium Treatment Requirements

a) Determination of the Mean ~~mean~~ Cryptosporidium Level ~~level.~~

1) Following completion of the initial source water monitoring required by Section 611.1001(a), an unfiltered system supplier is required to have calculated the arithmetic mean of all Cryptosporidium sample concentrations reported under ~~pursuant to~~ Section 611.1001(a). The supplier is required to have reported this value to the Agency for approval no later than six months after the month the supplier is required to have completed initial source water monitoring based on the applicable schedule set forth in Section 611.1001(c).

2) Following completion of the second round of source water monitoring required by Section 611.1001(b), an unfiltered system supplier must calculate the arithmetic mean of all Cryptosporidium sample concentrations reported under ~~pursuant to~~ Section 611.1001(b). The supplier must report this value to the Agency for approval no later than six months after the month the supplier is required to complete the second round of source water monitoring based on the applicable schedule set forth in Section 611.1001(c).

3) If the monthly Cryptosporidium sampling frequency varies, a supplier must first calculate a monthly average for each month of monitoring. The supplier must then use these monthly average concentrations, rather than individual sample concentrations, in the calculation of the mean Cryptosporidium level in subsection (a)(1) or (a)(2).

4) The report to the Agency of the mean Cryptosporidium levels calculated under ~~pursuant to~~ subsections (a)(1) and (a)(2) must include a summary of the source water monitoring data used for the calculation.

5) A failure to comply with the conditions of subsection (a) is a violation of the treatment technique requirement.

b) Cryptosporidium Inactivation Requirements ~~inactivation requirements~~. An unfiltered system supplier must provide the level of inactivation for Cryptosporidium specified in this subsection, based on its mean Cryptosporidium levels, as determined under ~~pursuant to~~ subsection (a) and according to the applicable schedule set forth in Section 611.1013.

1) An unfiltered system supplier with a mean Cryptosporidium level of 0.01 oocysts/ℓ or less must provide at least 2-log Cryptosporidium inactivation.

2) An unfiltered system supplier with a mean Cryptosporidium level of greater than 0.01 oocysts/ℓ must provide at least 3-log Cryptosporidium inactivation.

c) Inactivation Treatment Technology Requirements ~~treatment technology requirements~~. An unfiltered system supplier must use chlorine dioxide, ozone, or UV, as described in Section 611.1020, to meet the Cryptosporidium inactivation requirements of this Section.

1) A supplier that uses chlorine dioxide or ozone and fails to achieve the Cryptosporidium inactivation required in subsection (b) on more than one day in the calendar month is in violation of the treatment technique requirement.

2) A supplier that uses UV light and fails to achieve the Cryptosporidium inactivation required in subsection (b) by meeting the criteria in Section 611.1020(d)(3)(B) is in violation of the treatment technique requirement.

d) Use of Two Disinfectants ~~two disinfectants~~. An unfiltered system supplier must meet the combined Cryptosporidium inactivation requirements of this Section and Giardia lamblia and virus inactivation requirements of Section 611.241 using a minimum of two disinfectants, and each of two disinfectants must separately achieve the total inactivation required for any of Cryptosporidium, Giardia lamblia, or viruses.

BOARD NOTE: Derived from 40 CFR 141.712 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1013 Treatment Technique Requirements: Schedule for Compliance with Cryptosporidium Treatment Requirements

a) Following initial bin classification under Section 611.1010(c), a filtered system supplier must provide the level of treatment for Cryptosporidium required by Section 611.1011 according to the applicable schedule set forth in subsection (c).

b) Following initial determination of the mean Cryptosporidium level under Section 611.1012(a)(1), an unfiltered system supplier must provide the level of treatment for Cryptosporidium required by Section 611.1012 according to the applicable schedule set forth in subsection (c).

c) Cryptosporidium Treatment Compliance Dates ~~treatment compliance dates~~. A supplier must immediately comply with Cryptosporidium treatment requirements.

BOARD NOTE: The federal compliance dates and possible two-year extension provided by corresponding 40 C.F.R. § 141.713(c) are all past dates. The Board omitted text corresponding with the table in 40 C.F.R. § 141.713(c).

~~1) A supplier that serves 100,000 or more persons is required to have complied with Cryptosporidium treatment requirements before April 1, 2012.~~

~~2) A supplier that serves 50,000 to 99,999 persons is required to have complied with Cryptosporidium treatment requirements before October 1, 2012.~~

~~3) A supplier that serves 10,000 to 49,999 persons must comply with Cryptosporidium treatment requirements before October 1, 2013.~~

~~4) A supplier that serves fewer than 10,000 persons must with Cryptosporidium treatment requirements before October 1, 2014.~~

~~5) The Agency may, by a SEP, allow up to an additional two years from the applicable date set forth in this subsection (c) for complying with the treatment requirement if it determines that the additional time is necessary for the supplier to make capital improvements to implement the treatment.~~

d) If the bin classification for a filtered system supplier changes following the second round of source water monitoring, as determined under Section 611.1010(d), the supplier must provide the level of treatment for Cryptosporidium required by Section 611.1011 on a schedule approved by the Agency by a SEP.

e) If the mean Cryptosporidium level for an unfiltered system supplier changes following the second round of monitoring, as determined under Section 611.1012(a)(2), and if the supplier must provide a different level of Cryptosporidium treatment under Section 611.1012 due to this change, the supplier must meet this treatment requirement on a schedule approved by the Agency by a SEP.

BOARD NOTE: Derived from 40 CFR 141.713 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1015 Requirements for Microbial Toolbox Components: Microbial Toolbox Options for Meeting Cryptosporidium Treatment Requirements

a) Treatment Credits ~~credits.~~

1) A supplier receives the applicable of the treatment credits set forth in subsection (b) by meeting the conditions for microbial toolbox options described in Sections 611.1016 through 611.1020. The supplier applies these treatment credits to meet the applicable treatment requirements set forth in Section 611.1011 or Section 611.1012.

2) An unfiltered system supplier is eligible for treatment credits for the microbial toolbox options described in Section 611.1020 only.

b) Subsections (b)(1) through (b)(5) summarize options in the microbial toolbox.~~:~~

1) Source Protection ~~protection~~ and Management Toolbox Options ~~management toolbox options.~~

A) Watershed Control Program. ~~control program:~~ 0.5-log credit for Agency-approved program comprising required elements, annual program status report to Agency, and regular watershed survey. An unfiltered system supplier is not eligible for credit. Specific criteria are set forth in Section 611.1016(a).

B) Alternative source or intake management: No prescribed credit. A supplier may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. Specific criteria are set forth in Section 611.1016(b).

2) Pre-Filtration Toolbox Options.~~Pre-filtration toolbox options.~~

A) Presedimentation Basin ~~basin~~ with Coagulation. ~~coagulation:~~ 0.5-log credit during any month that presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative Agency-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through basins. Specific criteria are set forth in Section 611.1017(a).

B) Two-stage Lime Softening. ~~lime softening:~~ 0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment. Specific criteria are set forth in Section 611.1017(b).

C) Bank Filtration. ~~filtration:~~ 0.5-log credit for 25-foot setback or 1.0-log credit for 50-foot setback; the aquifer must be unconsolidated sand containing at least ten ~~10~~ percent fines and average turbidity in the wells must be less than 1 NTU. A supplier using wells followed by filtration when conducting source water monitoring must sample the well to determine bin classification and is not eligible for additional credit. Specific criteria are set forth in Section 611.1017(c).

3) Treatment Performance Toolbox Options ~~performance toolbox options.~~

A) Combined Filter Performance. ~~filter performance:~~ 0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95 percent of measurements each month. Specific criteria are set forth in Section 611.1018(a).

B) Individual Filter Performance. ~~filter performance:~~ 0.5-log credit (in addition to 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter. Specific criteria are set forth in Section 611.1018(b).

C) Demonstration of Performance. ~~performance:~~ Credit awarded to unit process or treatment train based on a demonstration to the Agency with an Agency-approved protocol. Specific criteria are set forth in Section 611.1018(c).

4) Additional Filtration Toolbox Options ~~filtration toolbox options.~~

A) Bag or Cartridge Filters ~~cartridge filters~~ (individual filters).~~:~~ Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety. Specific criteria are set forth in Section 611.1019(a).

B) Bag or Cartridge Filters ~~cartridge filters~~ (in series).~~:~~ Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety. Specific criteria are set forth in Section 611.1019(a).

C) Membrane Filtration. ~~filtration:~~ Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. Specific criteria are set forth in Section 611.1019(b).

D) Second Stage Filtration. ~~stage filtration:~~ 0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter. Specific criteria are set forth in Section 611.1019(c).

E) Slow Sand Filters. ~~sand filters:~~ 2.5-log credit as a secondary filtration step or 3.0-log credit as a primary filtration process. No prior chlorination for either option. Specific criteria are set forth in Section 611.1019(d).

5) Inactivation Toolbox Options ~~toolbox options.~~

A) Chlorine Dioxide. ~~dioxide:~~ Log credit based on measured CT in relation to CT table. Specific criteria are set forth in Section 611.1020(b).

B) Ozone.~~:~~ Log credit based on measured CT in relation to CT table. Specific criteria are set forth in Section 611.1020(b).

C) UV.~~:~~ Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions. Specific criteria are set forth in Section 611.1020(d).

BOARD NOTE: Derived from 40 CFR 141.715 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ____________________)

Section 611.1016 Requirements for Microbial Toolbox Components: Source Toolbox Components

a) Watershed Control Program ~~control program~~. A supplier receives 0.5-log Cryptosporidium treatment credit for implementing a watershed control program that meets the requirements of this Section.

1) A supplier that intends to apply for the watershed control program credit must notify the Agency of its intent no later than two years prior to the treatment compliance date applicable to the supplier in Section 611.1013.

2) A supplier must submit to the Agency a proposed watershed control plan no later than one year before the applicable treatment compliance date in Section 611.1013. The Agency must approve the watershed control plan for the supplier to receive watershed control program treatment credit. The watershed control plan must include the following elements:

A) Identification of an "area of influence" outside of which the likelihood of Cryptosporidium or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under subsection (a)(5)(B);

B) Identification of both potential and actual sources of Cryptosporidium contamination and an assessment of the relative impact of these sources on the supplier's source water quality;

C) An analysis of the effectiveness and feasibility of control measures that could reduce Cryptosporidium loading from sources of contamination to the supplier's source water; and

D) A statement of goals and specific actions the supplier will undertake to reduce source water Cryptosporidium levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

3) A supplier with an existing watershed control program (i.e., a program in place on January 5, 2006) is eligible to seek this credit. Its watershed control plans must meet the criteria in subsection (a)(2) and must specify ongoing and future actions that will reduce source water Cryptosporidium levels.

4) If the Agency does not respond to a supplier regarding approval of a watershed control plan submitted under this Section and the supplier meets

the other requirements of this Section, the watershed control program will be considered approved and 0.5 log Cryptosporidium treatment credit will be awarded, unless and until the Agency subsequently withdraws such approval by a SEP.

5) A supplier must complete each of the following actions to maintain the 0.5-log credit.

  A) It must submit an annual watershed control program status report to the Agency. The annual watershed control program status report must describe the supplier's implementation of the approved plan and assess the adequacy of the plan to meet its goals. The report must explain how the supplier is addressing any shortcomings in plan implementation, including those previously identified by the Agency or as the result of the watershed survey conducted under subsection (a)(5)(B). The report must also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a supplier determines during implementation that making a significant change to its approved watershed control program is necessary, the supplier must notify the Agency prior to making any such changes. If any change is likely to reduce the level of source water protection, the supplier must also list in its notification the actions the supplier will take to mitigate this effect;

  B) The supplier must undergo a watershed sanitary survey every three years for a CWS supplier and every five years for a non-CWS supplier and submit the survey report to the Agency. The survey must be conducted according to Agency guidelines and by persons that the Agency approves.

    i) The watershed sanitary survey must meet the following criteria: it must encompass the region identified in the Agency-approved watershed control plan as the area of influence; assess the implementation of actions to reduce source water Cryptosporidium levels; and identify any significant new sources of Cryptosporidium.

    ii) If the Agency determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, the supplier must undergo another watershed sanitary survey before a date the Agency requires by a SEP, which may be earlier than the regular date in subsection (a)(5)(B); and

  C) The supplier must make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The Agency may, by a SEP, approve that a supplier withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

6) If the Agency determines that a supplier is not carrying out the approved watershed control plan, the Agency may, by a SEP, withdraw the watershed control program treatment credit.

b) Alternative Source ~~source.~~

1) A supplier may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the Agency approves by a SEP, a supplier may determine its bin classification under Section 611.1010 based on the alternative source monitoring results.

2) If a supplier conducts alternative source monitoring under subsection (b)(1), it must also monitor their current plant intake concurrently as described in Section 611.1001.

3) Alternative source monitoring under subsection (b)(1) must meet the requirements for source monitoring to determine bin classification, as described in Sections 611.1001 through 611.1006. A supplier must report the alternative source monitoring results to the Agency, along with supporting information documenting the operating conditions under which the samples were collected.

4) If a supplier determines its bin classification under Section 611.1010 using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the supplier must relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in Section 611.1013.

BOARD NOTE: Derived from 40 CFR 141.716 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1017 Requirements for Microbial Toolbox Components: Pre-Filtration Treatment Toolbox Components

a) Presedimentation. A supplier receives 0.5-log Cryptosporidium treatment credit for a presedimentation basin during any month the process meets the criteria in this subsection (a).

1) The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or groundwater under the direct influent of surface water source.

2) The supplier must continuously add a coagulant to the presedimentation basin.

3) The presedimentation basin must achieve both of the following performance criteria:

   A) It demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction must be determined using daily turbidity measurements in the presedimentation process influent and effluent, and it must be calculated as follows: $\log_{10}$(monthly mean of daily influent turbidity)-$\log_{10}$(monthly mean of daily effluent turbidity); and

   B) It complies with Agency-approved performance criteria that demonstrate at least 0.5-log mean removal of micronsized particulate material through the presedimentation process.

b) Two-Stage Lime Softening~~Two-stage lime softening~~. A supplier receives an additional 0.5-log Cryptosporidium treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or groundwater under the direct influent of surface water source.

c) Bank Filtration ~~filtration~~. A supplier receives Cryptosporidium treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this subsection (c). A supplier using bank filtration when it begins source water monitoring under Section 611.1001(a) must collect samples as described in Section 611.1003(d), and it is not eligible for this credit.

1) A well with a groundwater flow path of at least 25 feet receives 0.5-log treatment credit, or a well with a groundwater flow path of at least 50 feet receives 1.0-log treatment credit. The groundwater flow path must be determined as specified in subsection (c)(4).

2) Only a well in granular aquifers is eligible for treatment credit. A granular aquifer is one comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A supplier must characterize the aquifer at the well site to determine aquifer properties. A supplier must extract a core from the aquifer and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter constitute at least ten ~~10~~ percent of the core material.

3) Only a horizontal or vertical well is eligible for treatment credit.

4) For a vertical well, the groundwater flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For a horizontal well, the groundwater flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

5) The supplier must monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the supplier must report this result to the Agency and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the Agency determines that microbial removal has been compromised, it may, by a SEP, revoke treatment credit until the supplier implements corrective actions approved by the Agency to remediate the problem.

6) Springs and infiltration galleries are not eligible for treatment credit under this Section, but are eligible for credit under Section 611.1018(c).

7) Bank Filtration Demonstration ~~filtration demonstration~~ of Performance ~~performance~~. The Agency may, by a SEP, approve Cryptosporidium treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this subsection. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in subsections (c)(1) through (c)(5).

   A) The study must follow an Agency-approved protocol and must involve the collection of data on the removal of Cryptosporidium or a surrogate for Cryptosporidium and related hydrogeologic and water quality parameters during the full range of operating conditions.

   B) The study must include sampling both from the production wells and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production wells.

BOARD NOTE: Derived from 40 CFR 141.717 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1018 Requirements for Microbial Toolbox Components: Treatment Performance Toolbox Components

a) Combined Filter Performance ~~filter performance~~. A supplier that uses conventional filtration treatment or direct filtration treatment receives an additional 0.5-log Cryptosporidium treatment credit during any month it meets the criteria in this subsection (a). Its combined filter effluent (CFE) turbidity must be less than or equal to 0.15 NTU in at least 95 percent of the measurements. Turbidity must be measured as described in Sections 611.531 and 611.533.

b) Individual Filter Performance ~~filter performance~~. A supplier that uses conventional filtration treatment or direct filtration treatment receives 0.5-log Cryptosporidium treatment credit, which can be in addition to the 0.5-log credit under subsection (a), during any month it meets the criteria in this subsection (b). Compliance with these criteria must be based on individual filter turbidity monitoring as described in Section 611.744 or 611.956(a), as applicable.

1) The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

2) No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

3) Any supplier that has received treatment credit for individual filter performance and fails to meet the requirements of subsection (b)(1) or (b)(2) during any month does not receive a treatment technique violation under Section 611.1011(c) if the Agency determines the following:

A) The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance; and

B) The supplier has experienced no more than two such failures in any calendar year.

c) Demonstration of Performance ~~performance~~. The Agency may, by a SEP, approve Cryptosporidium treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this subsection (c). This treatment credit may be greater than or less than the prescribed treatment credits in Section 611.1011 or Sections 611.1017 through 611.1020 and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

1) The supplier cannot receive the prescribed treatment credit for any toolbox option in Sections 611.1017 through 611.1020 if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this subsection (b).

2) The demonstration of performance study must follow an Agency-approved protocol and must demonstrate the level of Cryptosporidium reduction the treatment process will achieve under the full range of expected operating conditions for the supplier.

3) Approval by the Agency must be in writing and may include monitoring and treatment performance criteria that the supplier must demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The Agency may, by a SEP, designate such criteria where necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

BOARD NOTE: Derived from 40 CFR 141.718 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1019 Requirements for Microbial Toolbox Components: Additional Filtration Toolbox Components

a) Bag and Cartridge Filters ~~cartridge filters~~. A supplier receives Cryptosporidium treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by meeting the criteria set forth in subsections (a)(1) through (a)(10). To be eligible for this credit, the supplier must report the results of challenge testing that meets the requirements of subsections (a)(2) through (a)(9) to the Agency. The filters must treat the entire plant flow taken from a Subpart B source.

1) The Cryptosporidium treatment credit awarded to bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria set forth in subsections (a)(2) through (a)(9). A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. A supplier may use results from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria specified in subsections (a)(2) through (a)(9).

2) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the supplier will use for removal of Cryptosporidium. Bag or cartridge filters must be challenge tested in the same configuration that the supplier will use, either as individual filters or as a series configuration of filters.

3) Challenge testing must be conducted using Cryptosporidium or a surrogate that is removed no more efficiently than Cryptosporidium. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate

must be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.

4) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

$$\text{Maximum Feed Concentration} = 1 \times 10^4 \times (\text{Filtrate Detection Limit})$$

5) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

6) Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this Subpart Z.

7) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$$\text{LRV} = \text{Log}_{10}(C_f) - \text{Log}_{10}(C_p)$$

Where:

LRV = log removal value demonstrated during challenge testing
C_f = the feed concentration measured during the challenge test
C_p = the filtrate concentration measured during the challenge test. In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term Cp must be set equal to the detection limit.

8) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours after ~~of~~ start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter ($\text{LRV}_{\text{filter}}$) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

9) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest $\text{LRV}_{\text{filter}}$ among the

filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRV_{filter} values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

10) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted in writing to the Agency.

b) Membrane Filtration ~~filtration.~~

1) A supplier receives Cryptosporidium treatment credit for membrane filtration that meets the criteria of this subsection (b). Membrane cartridge filters that meet the definition of membrane filtration in Section 611.102 are eligible for this credit. The level of treatment credit a supplier receives is equal to the lower of the following values:

A) The removal efficiency demonstrated during challenge testing conducted under the conditions in subsection (b)(2); or

B) The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in subsection (b)(3).

2) Challenge Testing ~~testing~~. The membrane used by the supplier must undergo challenge testing to evaluate removal efficiency, and the supplier must report the results of challenge testing to the Agency. Challenge testing must be conducted according to the criteria set forth in subsections (b)(2)(A) through (b)(2)(G). A supplier may use data from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria set forth in subsections (b)(2)(A) through (b)(2)(G).

A) Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the supplier’s treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

B) Challenge testing must be conducted using Cryptosporidium oocysts or a surrogate that is removed no more efficiently than Cryptosporidium oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

C) The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

$$\text{Maximum Feed Concentration} = 3.16 \times 10^6 \times (\text{Filtrate Detection Limit})$$

D) Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

E) Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$\text{LRV} = \text{Log}_{10}(\text{C}_\text{f}) - \text{Log}_{10}(\text{C}_\text{p})$$

Where:

LRV = log removal value demonstrated during the challenge test
C_f = the feed concentration measured during the challenge test
C_p = the filtrate concentration measured during the challenge test. Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

F) The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value ($\text{LRV}_{\text{C-Test}}$). If fewer than 20 modules are tested, then $\text{LRV}_{\text{C-Test}}$ is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then

LRVC-Test is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

G) The challenge test must establish a quality control release value (QCRV) for a non-destructive performance test that demonstrates the Cryptosporidium removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the supplier that was not directly challenge tested in order to verify Cryptosporidium removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

H) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the Agency.

3) Direct Integrity Testing ~~integrity testing~~. A supplier must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in subsections (b)(3)(A) through (b)(3)(F). A "direct integrity test" is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate).

A) The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the treatment system for the purpose of integrity testing or other maintenance.

B) The direct integrity method must have a resolution of three micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

C) The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the Agency, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test.

Sensitivity must be determined using the appropriate of the following approaches, considering the type of direct integrity test the supplier uses:

i) For a direct integrity test that uses an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = Log_{10}\left(\frac{Q_p}{VCF \times Q_{breach}}\right)$$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test
Q_p = total design filtrate flow from the membrane unit
Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured
VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water; or

ii) For a direct integrity test that uses a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = Log_{10}(C_f) - Log_{10}(C_p)$$

Where:
LRV_{DIT} = the sensitivity of the direct integrity test
C_f = the typical feed concentration of the marker used in the test
C_p = the filtrate concentration of the marker from an integral membrane unit

D) A supplier must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the Agency.

E) If the result of a direct integrity test exceeds the control limit established under subsection (b)(3)(D), the supplier must remove the membrane unit from service. The supplier must conduct a direct integrity test to verify any repairs, and it may return the membrane unit to service only if the direct integrity test is within the established control limit.

F) A supplier must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The Agency may, by a SEP, approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for Cryptosporidium, or reliable process safeguards.

4) Indirect Integrity Monitoring ~~integrity monitoring~~. A supplier must conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in subsections (b)(4)(A) through (b)(4)(E). "Indirect integrity monitoring" is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A supplier that implements continuous direct integrity testing of membrane units in accordance with the criteria in subsections (b)(3)(A) through (b)(3)(E) is not subject to the requirements for continuous indirect integrity monitoring. The supplier must submit a monthly report to the Agency summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

A) Unless the Agency approves an alternative parameter by a SEP, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

B) Continuous indirect integrity monitoring must be conducted at a frequency of no less than once every 15 minutes.

C) Continuous indirect integrity monitoring must be separately conducted on each membrane unit.

D) If continuous indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit, as specified in subsections (b)(3)(A) through (b)(3)(E).

E) If indirect integrity monitoring includes an Agency-approved alternative parameter and if the alternative parameter exceeds an Agency-approved control limit for a period greater than 15 minutes, direct integrity testing must immediately be performed on the associated membrane units, as specified in subsections (b)(3)(A) through (b)(3)(E).

c) Second Stage Filtration ~~stage filtration~~. A supplier receives 0.5-log Cryptosporidium treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC, or other fine grain media following granular media filtration if the Agency approves by a SEP. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or groundwater under the direct influence of surface water source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The Agency must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

d) Slow Sand Filtration ~~sand filtration~~ (as secondary filter). A supplier is eligible to receive 2.5-log Cryptosporidium treatment credit by a SEP for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or groundwater under the direct influence of surface water source and no disinfectant residual is present in the influent water to the slow sand filtration process. The Agency must approve the treatment credit based on an assessment of the design characteristics of the filtration process. This subsection (d) does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

BOARD NOTE: Derived from 40 CFR 141.719 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1020 Requirements for Microbial Toolbox Components: Inactivation Toolbox Components

a) Calculation of CT Values ~~values.~~

1) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). A supplier with treatment credit for chlorine dioxide or ozone under subsection (b) or (c) must calculate CT at least once each day, with both C and T measured during peak hourly flow, as specified in Sections 611.531 and 611.532.

2) A supplier with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, the supplier must add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.

b) CT Values ~~values~~ for Chlorine Dioxide ~~chlorine dioxide~~ and Ozone ~~ozone.~~

1) A supplier receives the Cryptosporidium treatment credit listed in Table H ~~to this Part~~ by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in subsection (a).

2) A supplier receives the Cryptosporidium treatment credit listed in Table I ~~to this Part~~ by meeting the corresponding ozone CT values for the applicable water temperature, as described in subsection (a).

c) Site-Specific Study~~Site-specific study~~. The Agency may, by a SEP, approve alternative chlorine dioxide or ozone CT values to those listed in Tables H and I ~~to this Part~~ on a site-specific basis. The Agency must base this approval on a site-specific study conducted by the supplier according to an Agency-approved protocol.

d) Ultraviolet Light ~~light~~. A supplier receives Cryptosporidium, Giardia lamblia, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in Table J ~~to this Part~~. The supplier must validate and monitor UV reactors, as described in subsections (d)(2) and (d)(3), to demonstrate that they are achieving a particular UV dose value for treatment credit.

1) UV Dose Table ~~dose table~~. The treatment credits listed in Table J ~~to this Part~~ are for UV light at a wavelength of 254 nm as produced by a low-pressure mercury vapor lamp. To receive treatment credit for other lamp types, a supplier must demonstrate an equivalent germicidal dose through reactor validation testing, as described in subsection (d)(2). The UV dose values in this table are applicable only to post-filter applications of UV in a filtered system supplier and to an unfiltered system supplier.

2) Reactor Validation Testing ~~validation testing~~. A supplier must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in subsection (d)(1) (i.e., validated operating conditions). These operating conditions must include flow rate; UV intensity, as measured by a UV sensor; and UV lamp status.

A) When determining validated operating conditions, a supplier must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical treatment system components; and inlet and outlet piping or channel configurations of the UV reactor.

B) Validation testing must include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the supplier and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

C) The Agency may, by a SEP, approve an alternative approach to validation testing.

3) Reactor Monitoring ~~monitoring.~~

A) A supplier must monitor its UV reactors to determine if the reactors are operating within validated conditions, as determined under subsection (d)(2). This monitoring must include UV intensity, as measured by a UV sensor; flow rate; lamp status; and other parameters that the Agency has designated by a SEP based on UV reactor operation. A supplier must verify the calibration of UV sensors and must recalibrate sensors in accordance with a protocol that the Agency has approved by the SEP.

B) To receive treatment credit for UV light, a supplier must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in subsections (d)(1) and (d)(2). The supplier must demonstrate compliance with this condition by the monitoring required under subsection (d)(3)(A).

BOARD NOTE: Derived from 40 CFR 141.720 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

SUBPART AA: REVISED TOTAL COLIFORM RULE

Section 611.1052 Analytical Methods and Laboratory Certification

a) Analytical Methodology ~~methodology.~~

1) The standard sample volume required for analysis, regardless of analytical method used, is 100 mℓ.

2) A supplier needs only determine the presence or absence of total coliforms and E. coli; a determination of density is not required.

3) The time from sample collection to initiation of test medium incubation may not exceed 30 hours. Suppliers are encouraged but not required to hold samples below 10 ºC ~~10º C~~ during transit.

4) If water having residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate ($Na_2S_2O_3$) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in section 2 of SM ~~Standard Methods, 20th or 21st ed., Method~~ 9060 A (97), ~~each~~ incorporated by reference in Section 611.102.

5) The supplier must conduct total coliform and E. coli analyses in accordance with one of the following analytical methods, each incorporated by reference in Section 611.102:

BOARD NOTE: All monitoring and analyses must be done in accordance with the version of the approved method recited in this subsection (a) and incorporated by reference in Section 611.102. The methods listed are the only versions that may be used for compliance with this Subpart AA. Laboratories should be careful to use only the approved versions of the methods, as product package inserts may not be the same as the approved versions of the methods.

A) Total Coliforms, Lactose Fermentation Methods ~~coliforms, lactose fermentation methods:~~

i) Total Coliform Fermentation Technique. Sections ~~total coliform fermentation technique: sections~~ 1 and 2 of SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9221 B (94) (only the 20th ed.), SM 9221 B (99), SM 9221 B (06), or sections 1 through 4 of SM 9221 B (14).~~; or~~

BOARD NOTE: Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth, if the supplier 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 false-negative rate for total coliforms, using lactose broth, is less than ten ~~10~~ percent. ~~Because Standard Methods, 21st ed., Method 9221 B is the same version as Standard Methods Online 9221 B-99, the Board has not listed the Standard Methods Online version separately.~~

ii) Presence-Absence (P–A) Coliform Test. Sections ~~Presence-absence (P–A) coliform test: sections~~ 1 and 2 of SM ~~Standard Methods, 20th or 21st, Method~~ 9221 D (94), SM 9221 D (99), or sections 1 through 3 of SM 9221 D (14).

BOARD NOTE: A multiple tube enumerative format, as described in SM ~~Standard Methods, 20th or 21st, Method~~ 9221 D (94), SM 9221 D (99), or SM 9221 D (14), is approved for this method for use in presence-absence determination under this Subpart AA. ~~Because Standard Methods, 21st ed., Method 9221 D is the same version as Standard Methods Online 9221 D-99, the Board has not listed the Standard Methods Online version separately.~~

~~BOARD NOTE: USEPA added sections 1 and 2 of Standard Methods Online, Method 9221 B-06 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 9221 B is the same version as Standard Methods Online, Method 9221 B-06, the Board has not listed the Standard Methods Online versions separately.~~

B) Total Coliforms, Membrane Filtration Methods ~~coliforms, membrane filtration methods:~~

i) Standard Total Coliform Membrane Filter Procedure using Endo medium. ~~total coliform membrane filter procedure:~~ SM ~~Standard Methods, 20th or 21st ed., Method~~ 9222 B (97), SM 9222 B (15), SM 9222 C (97), or SM 9222 C (15).

~~BOARD NOTE: Because Standard Methods, 20th ed., Methods 9222 B and C are the same version as Standard Methods Online 9222 B and C-97, the Board has not listed the Standard Methods Online version separately.~~

ii) Membrane Filtration Using MI Medium. ~~filtration using MI medium:~~ USEPA ~~Method~~ 1604 (02).

iii) Hach 10029 (99) (m-ColiBlue24®) ~~Test~~.

BOARD NOTE: All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

iv) Chromocult® (00) ~~Method~~.

BOARD NOTE: All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

C) Total Coliforms, Enzyme Substrate Methods ~~coliforms, enzyme~~

~~substrate methods:~~

i) Colilert®.~~ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), or SM 9223 B (16).~~;~~

BOARD NOTE: Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this Subpart AA.

ii) Colilert®-18.~~ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), or SM 9223 B (16).~~;~~

iii) Colisure®.~~™ Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), or SM 9223 B (16).~~;~~

BOARD NOTE: Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this Subpart AA. Colisure™ Test results may be read after an incubation time of 24 hours.~~ Because Standard Methods, 20th ed., Method 9223 B is the same version as Standard Methods Online 9223 B-97, the Board has not listed the Standard Methods Online version separately.~~

iv) E*Colite® (98).~~ Test;~~

v) Readycult® (07).~~ 2007 Test;~~

vi) Modified Colitag™ (09).~~ Test; or~~

vii) Tecta (14) or Tecta (17)~~ EC/TC P-A Test, ver. 1.0 or 2.0~~.

~~BOARD NOTE: USEPA added Standard Methods Online, Method 9223 B-04, Colilert®-18 Test, and Tecta EC/TC P-A Test, ver 1.0 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added Tecta EC/TC P-A Test, ver. 2.0 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 9223 B is the same version as Standard Methods Online, Method 9223 B-04, the Board has not listed the Standard Methods Online versions separately.~~

D) E. coli (following lactose fermentation methods), EC-MUG Medium.~~ medium:~~ Section ~~section~~ 1 of SM ~~Standard Methods, 20th or 22nd ed., Method~~ 9221 F (94), section 1 of SM 9221 F

(01), section 1 of SM 9221 F (06), or section 1 of SM 9221 F (14).

~~BOARD NOTE: USEPA added section 1 of Standard Methods Online, Method 9221 F-06 as an approved alternative method on June 19, 2014 (at 79 Fed. Reg. 35081). Because Standard Methods, 22nd ed., Method 9221 F is the same version as Standard Methods Online, Method 9221 F-06, the Board has not listed the Standard Methods Online versions separately.~~

E) E. coli, Partition Methods (following membrane filtration methods) ~~partition method:~~

i) EC Broth ~~broth~~ with MUG (EC-MUG). ~~:~~ Section ~~section~~ 1.c(2) of SM ~~Standard Methods, 20th or 21st ed., Method~~ 9222 G (97) or SM 9222 H (15); or

BOARD NOTE: The following changes must be made to the EC broth with MUG (EC-MUG) formulation: potassium dihydrogen phosphate (KH_2PO_4) must be 1.5 g, and 4-methylumbelliferyl-β-D-glucuronide must be 0.05 g.

ii) NA-MUG Medium. ~~medium:~~ Section ~~section~~ 1.c(1) of SM ~~Standard Methods, 20th or 21st ed., Method~~ 9222 G (97) or SM 9222 I (15).

F) E. coli, Membrane Filtration Methods ~~membrane filtration methods:~~

i) Membrane Filtration Using ~~filtration using~~ MI Medium. ~~medium:~~ USEPA ~~Method~~ 1604 (02).

ii) Hach 10029 (99) (m-ColiBlue24®) ~~Test~~.

BOARD NOTE: All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

iii) Chromocult® (00) ~~Method~~.

BOARD NOTE: All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is pre-sterilized by the manufacturer (i.e., disposable funnel units) may be used.

G) E. coli, Enzyme Substrate Methods ~~enzyme substrate methods:~~

i) Colilert®. ~~Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), SM 9223 B (16);

BOARD NOTE: Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this Subpart AA. ~~Because Standard Methods, 20th ed., Method 9223 B is the same version as Standard Methods Online 9223 B-97, the Board has not listed the Standard Methods Online version separately.~~

ii) Colilert®-18. ~~Test:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), SM 9223 B (16);

iii) Colisure®.~~™:~~ SM ~~Standard Methods, 20th, 21st, or 22nd ed., Method~~ 9223 B (97), SM 9223 B (04), SM 9223 B (16);

BOARD NOTE: Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this Subpart AA. Colisure™ results may be read after an incubation time of 24 hours. ~~Because Standard Methods, 20th ed., Method 9223 B is the same version as Standard Methods Online 9223 B-97, the Board has not listed the Standard Methods Online version separately.~~

iv) E*Colite® (98) ~~Test~~;

v) Readycult® (07) ~~2007 Test~~;

vi) Modified Colitag™ (09) ~~Test~~; or

vii) Tecta (14) or Tecta (17) ~~EC/TC P-A Test, ver. 1.0 or 2.0~~.

~~BOARD NOTE: USEPA added Standard Methods, 22nd ed., Method 9223 B as an approved alternative method on June 21,~~

~~2013 (at 78 Fed. Reg. 37463). USEPA added Standard Methods Online, Method 9223 B-04, Colilert®-18 Test, and Tecta EC/TC P-A Test, ver. 1.0 as approved alternative methods on June 19, 2014 (at 79 Fed. Reg. 35081). USEPA added Tecta EC/TC P-A Test, ver. 2.0 as an approved alternative method on July 27, 2017 (at 82 Fed. Reg. 34861). Because Standard Methods, 22nd ed., Method 9223 B is the same version as Standard Methods Online, Method 9223 B-04, the Board has not listed the Standard Methods Online versions separately.~~

H) Simultaneous Detection of Total Coliforms and E. coli by Dual Chromogen Membrane Filter Procedure (Using m-ColiBlue24® medium). SM 9222 J (15).

b) Laboratory Certification ~~certification~~. A supplier must have all compliance samples required by this Subpart AA analyzed by a certified laboratory in one of the categories listed in Section 611.490(a). The laboratory used by the supplier must be certified for each method (and associated contaminants) that is used for compliance monitoring analyses under this Subpart AA.

c) This subsection (c) corresponds with 40 CFR 141.1052(c), which is a centralized listing of incorporations by reference for the purposes of subpart Y to 40 CFR 141. The Board has centrally located all incorporations by reference in Section 611.102. This statement maintains structural consistency with the federal rules.

BOARD NOTE: Derived from 40 CFR 141.852 and appendix A to subpart C of 40 CFR 141 ~~(2017)~~. The Board has not separately listed the following approved alternative methods from Standard Methods Online that are the same version as a method that appears in a printed edition of Standard Methods. Use of the Standard Methods Online copy is acceptable.

Standard Methods Online, Methods 9221 B-99 and 9221 D-99 appear in the 21st edition as Methods 9221 B and D. In this Section, this appears as Methods 9221 B and 9221 D. In this Section, these appear as SM 9221 B (99) and SM 9221 D (99).

Standard Methods Online, Methods 9221 B-06, 9221 D-06, and 9221 F-06 appear in the 22nd edition as Methods 9221 B, D, and F. In this Section, these appear as SM 9221 B (06), 9221 D (06), and SM 9221 F (06).

Standard Methods Online, Methods 9222 B-97, 9222 C-97, and 9222 G-97 appear in the 20th edition as Methods 9222 B, 9222 C, and 9222 G. In this Section, these appear as SM 9222 B (97), 9222 C (97), and SM 9222 G (97).

Standard Methods Online, Method 9223 B-97 appears in the 20th and 21st editions as Method 9223 B. In this Section, this appears as SM 9223 B (97).

Standard Methods Online, Method 9223 B-04 appears in the 22nd edition as Method 9223 B. In this Section, this appears as SM 9223 B (04).

(Source: Amended at 44 Ill. Reg. ________, effective ____________________)

Section 611.1053 General Monitoring Requirements for all PWSs

a) Sample Siting Plans ~~siting plans.~~

1) A supplier must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system. These plans are subject to Agency review and revision. The supplier must collect total coliform samples according to the written sample siting plan. Monitoring required by Sections 611.1054 through 611.1058 may take place at a customer's premises, a dedicated sampling station, or another designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of Subpart S must be reflected in the sampling plan.

2) A supplier must collect samples at regular time intervals throughout the month, except that systems that use only ground water and serve 4,900 or fewer people may collect all required samples on a single day if they are taken from different sites.

3) A supplier must take at least the minimum number of required samples even if the system has had an E. coli MCL violation or has exceeded the coliform treatment technique triggers in Section 611.1059(a).

4) A supplier may conduct more compliance monitoring than is required by this Subpart AA to investigate potential problems in the distribution system and use monitoring as a tool to assist in uncovering problems. A supplier may take more than the minimum number of required routine samples and must include the results in calculating whether the coliform treatment technique trigger in Section 611.1059(a)(1)(A) and (a)(1)(B) has been exceeded only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system.

5) A supplier must identify repeat monitoring locations in the sample siting plan. Unless the provisions of subsection (a)(5)(A) or (a)(5)(B) are met, the supplier must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the supplier must still take all required repeat samples. However, the Agency may grant a SEP that allows an alternative sampling location in lieu of the requirement to

collect at least one repeat sample upstream or downstream of the original sampling site. Except as provided for in subsection (a)(5)(B), a supplier required to conduct triggered source water monitoring under Section 611.802(a) must take ground water source samples in addition to repeat samples required under this Subpart AA.

A) A supplier may propose repeat monitoring locations to the Agency that the supplier believes to be representative of a pathway for contamination of the distribution system. A supplier may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) in its sample siting plan. The supplier must design its SOP to focus the repeat samples at locations that best verify and determine the extent of potential contamination of the distribution system area based on specific situations. The Agency may, by a SEP, modify the SOP or require alternative monitoring locations as the Agency determines is necessary.

B) A GWS supplier that serves 1,000 or fewer people may propose repeat sampling locations to the Agency that differentiate potential source water and distribution system contamination (e.g., by sampling at entry points to the distribution system). A GWS supplier that has a single well and which is required to conduct triggered source water monitoring may, as allowed by a SEP, take one of its repeat samples at the monitoring location required for triggered source water monitoring under Section 611.802(a). The supplier must justify an Agency determination that the sample siting plan remains representative of water quality in the distribution system. If approved by a SEP, the supplier may use that sample result to meet the monitoring requirements in both Section 611.802(a) and this Section.

i) If a repeat sample taken at the monitoring location required for triggered source water monitoring is E. coli-positive, the supplier has violated the E. coli MCL and must also comply with Section 611.802(a)(3). If a supplier takes more than one repeat sample at the monitoring location required for triggered source water monitoring, the supplier may reduce the number of additional source water samples required under Section 611.802(a)(3) by the number of repeat samples taken at that location that were not E. coli-positive.

ii) If a supplier takes more than one repeat sample at the monitoring location required for triggered source water monitoring under Section 611.802(a), and more than one repeat sample is E. coli-positive, the supplier has violated the E. coli MCL and must also comply with Section 611.803(a)(1).

iii) If all repeat samples taken at the monitoring location required for triggered source water monitoring are E. coli-negative and a repeat sample taken at a monitoring location other than the one required for triggered source water monitoring is E. coli-positive, the supplier has violated the E. coli MCL, but is not required to comply with Section 611.802(a)(3).

6) The Agency may, by a SEP, review, revise, and approve, as appropriate, repeat sampling proposed by a supplier under subsections (a)(5)(A) and (a)(5)(B). The supplier must justify an Agency determination that the sample siting plan remains representative of the water quality in the distribution system. The Agency may determine that monitoring at the entry point to the distribution system (especially for undisinfected ground water systems) is effective to differentiate between potential source water and distribution system problems.

b) Special Purpose Samples ~~purpose samples~~. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples taken under Section 611.1058 are not considered special purpose samples, and must be used to determine whether the coliform treatment technique trigger has been exceeded.

c) Invalidation of Total Coliform Samples ~~total coliform samples~~. A total coliform-positive sample invalidated under this subsection (c) does not count toward meeting the minimum monitoring requirements of this Subpart AA.

1) The Agency may, by a SEP, invalidate a total coliform-positive sample only if the conditions of subsection (c)(1)(A), (c)(1)(B), or (c)(1)(C) are met.

A) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

B) The Agency, on the basis of the results of repeat samples collected as required under Section 611.1058(a), determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Agency cannot invalidate a sample on the basis of repeat sample results unless all repeat samples collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a location other than the original tap are total coliform-negative (e.g., a Agency cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the system has only one service connection).

C) The Agency has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required under Section 611.1058(a), and use them to determine whether a coliform treatment technique trigger in Section 611.1059 has been exceeded. To invalidate a total coliform-positive sample under this subsection (c)(1), the decision and supporting rationale must be documented in writing and approved and signed by the Agency, as a SEP. The Agency must make this document available to USEPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the supplier has taken, or will take, to correct this problem. The Agency may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

2) A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the multiple-tube fermentation technique), produces a turbid culture in the absence of an acid reaction in the presence-absence (P–A) coliform test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., membrane filter technique). If a laboratory invalidates a sample because of such interference, the supplier must collect another sample from the same location as the original sample within 24 hours after ~~of~~ being notified of the interference problem, and have it analyzed for the presence of total coliforms. The supplier must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The Agency may, by a SEP, waive the 24-hour time limit on a case-by-case basis. Alternatively, the Agency or any interested person may file a petition for rulemaking, under Sections 27 and 28 of the Act ~~[415 ILCS 5/27 and 28]~~, to establish criteria for waiving the 24-hour sampling time limit to use in lieu of case-by-case extensions.

BOARD NOTE: Derived from 40 CFR 141.853 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1054 Routine Monitoring Requirements for Non-CWSs That Serve 1,000 or Fewer People Using Only Groundwater

a) General~~.~~

1) This Section applies to non-CWS suppliers that use only groundwater (except groundwater under the direct influence of surface water, as defined in Section 611.102) and which serve 1,000 or fewer people.

2) Following any total coliform-positive sample taken under this Section, a supplier must comply with the repeat monitoring requirements and E. coli analytical requirements in Section 611.1058.

3) Once all monitoring required by this Section and Section 611.1058 for a calendar month has been completed, a supplier must determine whether any coliform treatment technique triggers specified in Section 611.1059 have been exceeded. If any trigger has been exceeded, the supplier must complete assessments as required by Section 611.1059.

4) For the purpose of determining eligibility for remaining on or qualifying for quarterly monitoring under the provisions of subsections (f)(4) and (g)(2), respectively, for transient non-CWS suppliers, the Agency may elect to not count monitoring violations under Section 611.1060(c)(1) if the missed sample is collected no later than the end of the monitoring period following the monitoring period in which the sample was missed. The supplier must collect the make-up sample in a different week than the routine sample for that monitoring period and should collect the sample as soon as possible during the monitoring period. The Agency may not use this provision under subsection (h). This authority does not affect the provisions of Sections 611.1060(c)(1) and 611.1061(a)(4).

b) Monitoring Frequency ~~frequency~~ for Total Coliforms ~~total coliforms~~. A supplier must monitor each calendar quarter that the supplier provides water to the public, except for a seasonal system supplier or as provided under subsections (c) through (h) and (j). A seasonal system supplier must meet the monitoring requirements of subsection (i).

c) Transition to This ~~this~~ Subpart AA. The Agency must perform a special monitoring evaluation during each sanitary survey to review the status of the supplier's system, including the distribution system, to determine whether the supplier is on an appropriate monitoring schedule. After the Agency has performed the special monitoring evaluation during each sanitary survey, the Agency may modify the supplier's monitoring schedule, as the Agency determines is necessary, or the Agency may allow the supplier to stay on its existing monitoring schedule, consistent with the provisions of this Section. The Agency may not allow a supplier to begin less frequent monitoring under the special monitoring evaluation unless the supplier has already met the applicable criteria for less frequent monitoring in this Section. For a seasonal system supplier on quarterly or annual monitoring, this evaluation must include review of the approved sample siting plan, which must designate the time periods for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The seasonal system supplier must collect compliance samples during these time periods.

d) Annual Site Visits ~~site visits~~. A supplier on annual monitoring, including a seasonal system supplier, must have an initial and recurring annual site visit by the Agency that is equivalent to a Level 2 assessment or an annual voluntary Level 2 assessment that meets the criteria in Section 611.1059(b) to remain on annual monitoring. The periodic required sanitary survey may be used to meet the requirement for an annual site visit for the year in which the sanitary survey was completed.

e) Criteria for Annual Monitoring ~~annual monitoring~~. The Agency may, by a SEP, reduce the monitoring frequency for a well-operated GWS supplier from quarterly routine monitoring to no less than annual monitoring, if the supplier demonstrates that it meets the criteria for reduced monitoring in subsections (e)(1) through (e)(3), except for a supplier that has been on increased monitoring under the provisions of subsection (f). A supplier on increased monitoring under subsection (f) must meet the provisions of subsection (g) to go to quarterly monitoring and must meet the provisions of subsection (h) to go to annual monitoring.

1) The supplier's system has a clean compliance history for a minimum of 12 months;

2) The most recent sanitary survey shows that the supplier's system is free of sanitary defects or has corrected all identified sanitary defects, has a protected water source, and meets Agency-approved construction standards; and

3) The Agency has conducted an annual site visit within the last 12 months, and the supplier has corrected all identified sanitary defects. The supplier may substitute a Level 2 assessment that meets the criteria in Section 611.1059(b) for the Agency annual site visit.

f) Increased Monitoring Requirements ~~monitoring requirements~~ for Suppliers ~~suppliers~~ on Quarterly ~~quarterly~~ or Annual Monitoring ~~annual monitoring~~. A supplier on quarterly or annual monitoring that experiences any of the events identified in subsections (f)(1) through (f)(4) must begin monthly monitoring the month following the event. A supplier on annual monitoring that experiences the event identified in subsections (f)(5) must begin quarterly monitoring the quarter following the event. The supplier must continue monthly or quarterly monitoring until the requirements in subsection (g) for quarterly monitoring or subsection (h) for annual monitoring are met. A supplier on monthly monitoring for reasons other than those identified in subsections (f)(1) through (f)(4) is not considered to be on increased monitoring for the purposes of subsections (g) and (h).

1) The supplier's system triggers a Level 2 assessment or two Level 1 assessments under the provisions of Section 611.1059 in a rolling 12-month period.

2) The supplier's system has an E. coli MCL violation.

3) The supplier's system has a coliform treatment technique violation.

4) The supplier's system has two Subpart AA monitoring violations or one Subpart AA monitoring violation and one Level 1 assessment under the provisions of Section 611.1059 in a rolling 12-month period for a system on quarterly monitoring.

5) The supplier's system has one Subpart AA monitoring violation for a system on annual monitoring.

g) Requirements for Returning ~~returning~~ to Quarterly Monitoring ~~quarterly monitoring~~. The Agency may, by a SEP, reduce the monitoring frequency for a supplier on monthly monitoring triggered under subsection (f) to quarterly monitoring if the supplier's system meets the criteria in subsections (g)(1) and (g)(2).

1) Within the last 12 months, the supplier must have a completed sanitary survey or a site visit of its system by the Agency or a voluntary Level 2 assessment of its system by a party approved by the Agency, the supplier's system must be free of sanitary defects, and the supplier's system must have a protected water source; and

2) The supplier's system must have a clean compliance history for a minimum of 12 months.

h) Requirements for a Supplier ~~supplier~~ on Increased Monitoring ~~increased monitoring~~ to Qualify ~~qualify~~ for Annual Monitoring ~~annual monitoring~~. The Agency may, by a SEP, reduce the monitoring frequency for a supplier on increased monitoring under subsection (f) if the supplier's system meets the criteria in subsection (g) and the criteria in subsections (h)(1) and (h)(2).

1) An annual site visit by the Agency and correction of all identified sanitary defects. The supplier may substitute a voluntary Level 2 assessment by a party approved by the Agency for the Agency annual site visit in any given year.

2) The supplier must have in place or adopt one or more of the following additional enhancements to the water system barriers to contamination:

A) Cross connection control, as approved by the Agency.

B) An operator certified by an appropriate Agency certification program or regular visits by a circuit rider certified by an appropriate Agency certification program.

C) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the Agency.

D) Demonstration of maintenance of at least a four-log removal or inactivation of viruses as provided for under Section 141.403(b)(3).

E) Other equivalent enhancements to water system barriers as approved by the State.

i) Seasonal Systems ~~systems.~~

1) All seasonal system suppliers must demonstrate completion of an Agency-approved start-up procedure, which may include a requirement for startup sampling prior to serving water to the public.

2) A seasonal system supplier must monitor every month that it is in operation unless it meets the criteria in subsections (i)(2)(i) through (iii) to be eligible for monitoring less frequently than monthly, except as provided under subsection (c).

A) Seasonal a system supplier monitoring less frequently than monthly must have an approved sample siting plan that designates the time period for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). A seasonal system supplier must collect compliance samples during this time period.

B) To be eligible for quarterly monitoring, the supplier must meet the criteria in subsection (g).

C) To be eligible for annual monitoring, the supplier must meet the criteria under subsection (h).

3) The Agency may, by a SEP, exempt any seasonal system supplier from some or all of the requirements for seasonal system suppliers if the entire distribution system remains pressurized during the entire period that the supplier's system is not operating, except that a supplier that monitors less frequently than monthly must still monitor during the vulnerable period designated by the Agency.

j) Additional Routine Monitoring ~~routine monitoring~~ the Month Following ~~month following~~ a Total Coliform-Positive Sample ~~total coliform-positive sample~~. A supplier that collects samples on a quarterly or annual frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). The supplier must collect at least three routine samples during the next month, except that the Agency may, by a SEP, waive this requirement if the conditions of subsection (j)(1), (j)(2), or (j)(3) are met. The supplier may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. The supplier must use the results of additional routine samples in coliform treatment technique trigger calculations under Section 611.1059(a).

1) The Agency may, by a SEP, waive the requirement to collect three routine samples the next month in which the supplier provides water to the public if the Agency, or an agent approved by the Agency, performs a site visit before the end of the next month in which the supplier's system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Agency to determine whether additional monitoring or any corrective action is needed. The Agency cannot approve an employee of the supplier to perform this site visit, even if the employee is an agent approved by the Agency to perform sanitary surveys.

2) The Agency may, by a SEP, waive the requirement to collect three routine samples the next month in which the supplier provides water to the public if the Agency has determined why the sample was total coliform-positive and has established that the supplier has corrected the problem or will correct the problem before the end of the next month in which the supplier's system serves water to the public. In this case, the Agency must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Agency official who recommends such a decision, and make this document available to USEPA and public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the supplier has taken or will take to correct this problem.

3) The Agency may not waive the requirement to collect three additional routine samples the next month in which the supplier's system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the Agency determines that the supplier has corrected the contamination problem before the supplier takes the set of repeat samples required in Section 611.1058, and all repeat samples were total coliform-negative, the Agency may, by a SEP, waive the requirement for additional routine monitoring the next month.

BOARD NOTE: Derived from 40 CFR 141.854~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1055 Routine Monitoring Requirements for CWSs That Serve 1,000 or Fewer People Using Only Groundwater

a) General~~.~~

1) This Section applies to CWS suppliers that use only ground water (except ground water under the direct influence of surface water, as defined in Section 611.102) and which serve 1,000 or fewer people.

2) Following any total coliform-positive sample taken under the provisions of this Section, the supplier must comply with the repeat monitoring requirements and E. coli analytical requirements in Section 611.1058.

3) Once all monitoring required by this Section and Section 611.1058 for a calendar month has been completed, the supplier must determine whether any coliform treatment technique triggers specified in Section 611.1059 have been exceeded. If any trigger has been exceeded, the supplier must complete assessments as required by Section 611.1059.

b) Monitoring Frequency ~~frequency~~ for Total Coliforms ~~total coliforms~~. The monitoring frequency for total coliforms is one sample per month, except as provided for under subsections (c) through (f).

c) Transition to Subpart AA. The Agency must perform a special monitoring evaluation during each sanitary survey to review the status of the supplier's system, including the distribution system, to determine whether the system is on an appropriate monitoring schedule. After the Agency has performed the special monitoring evaluation during each sanitary survey, the Agency may, by a SEP issued under ~~pursuant to~~ Section 611.110, modify the supplier's monitoring schedule, as necessary. Alternatively, the Agency may allow the supplier to stay on its existing monitoring schedule, consistent with the provisions of this Section. The Agency may not allow a supplier to begin less frequent monitoring under the special monitoring evaluation unless the supplier has already met the applicable criteria for less frequent monitoring in this Section.

d) Criteria for Reduced Monitoring ~~reduced monitoring.~~

1) The Agency may, by a SEP, reduce the monitoring frequency from monthly monitoring to no less than quarterly monitoring if the supplier is in compliance with Agency-certified operator provisions and demonstrates that it meets the criteria in subsections (d)(1)(A) through (d)(1)(C). A supplier that loses its certified operator must return to monthly monitoring the month following that loss.

A) The supplier has a clean compliance history for a minimum of 12 months.

B) The most recent sanitary survey shows the supplier is free of sanitary defects (or has an approved plan and schedule to correct them and is in compliance with the plan and the schedule), has a protected water source, and meets Agency-approved construction standards.

C) The supplier meets at least one of the following criteria:

i) An annual site visit by the Agency that is equivalent to a Level 2 assessment or an annual Level 2 assessment by a party approved by the Agency and correction of all identified sanitary defects (or an approved plan and schedule to correct them and is in compliance with the plan and schedule).

ii) Cross connection control, as approved by the Agency.

iii) Continuous disinfection entering the distribution system and a residual in the distribution system in accordance with criteria specified by the Agency.

iv) Demonstration of maintenance of at least a 4-log removal or inactivation of viruses as provided for under Section 611.803(b)(3).

v) Other equivalent enhancements to water system barriers as approved by the Agency.

2) This subsection (d)(2) corresponds with 40 CFR 141.855(d)(2), which USEPA has marked "reserved". This statement maintains structural consistency with the corresponding federal provision.

e) Return to Routine Monthly Monitoring Requirements ~~routine monthly monitoring requirements~~. A supplier on quarterly monitoring that experience any of the events in subsections (e)(1) through (e)(4) must begin monthly monitoring the month following the event. The supplier must continue monthly monitoring until it meets the reduced monitoring requirements in subsection (d).

1) The supplier triggers a Level 2 assessment or two Level 1 assessments in a rolling 12-month period.

2) The supplier has an E. coli MCL violation.

3) The supplier has a coliform treatment technique violation.

4) The supplier has two Subpart AA monitoring violations in a rolling 12-month period.

f) Additional Routine Monitoring ~~routine monitoring~~ the Month Following ~~month following~~ a Total Coliform-Positive Sample ~~total coliform-positive sample~~. A supplier collecting samples on a quarterly frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). A supplier must collect at least three routine samples during the next month, except that the Agency may, by a SEP ~~issued under Section 611.110~~, waive this requirement if the conditions of subsection (f)(1), (f)(2), or (f)(3) are met. A supplier may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. A supplier must use the results of additional routine samples in coliform treatment technique trigger calculations.

1) The Agency may, by a SEP, waive the requirement to collect three routine samples the next month in which the supplier's system provides water to the public if the Agency, or an agent approved by the Agency, performs a site visit before the end of the next month in which the supplier's system provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Agency to determine whether additional monitoring or any corrective action is needed. The Agency cannot approve an employee of the supplier to perform this site visit, even if the employee is an agent approved by the Agency to perform sanitary surveys.

2) The Agency may, by a SEP, waive the requirement to collect three routine samples the next month in which the supplier's system provides water to the public if the Agency has determined why the sample was total coliform-positive and has established that the supplier has corrected the problem or will correct the problem before the end of the next month in which the supplier's system serves water to the public. In this case, the Agency must document this decision to waive the following month's additional monitoring requirement in writing, have it approved and signed by the supervisor of the Agency official who recommends such a decision, and make this document available to USEPA and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the supplier has taken or will take to correct this problem.

3) The Agency may not waive the requirement to collect three additional routine samples the next month in which the supplier's system provides water to the public solely on the grounds that all repeat samples are total coliform-negative. If the Agency determines that the supplier has corrected the contamination problem before the supplier takes the set of repeat samples required in Section 611.1058, and all repeat samples were

total coliform-negative, the Agency may, by a SEP, waive the requirement for additional routine monitoring the next month.

BOARD NOTE: Derived from 40 CFR 141.855 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1056 Routine Monitoring Requirements for Subpart B Systems That Serve 1,000 or Fewer People

a) General~~.~~

1) The provisions of this Section apply to a Subpart B system supplier that serves 1,000 or fewer people.

2) Following any total coliform-positive sample taken under the provisions of this Section, a supplier must comply with the repeat monitoring requirements and E. coli analytical requirements in Section 611.1058.

3) Once all monitoring required by this Section and Section 611.1058 for a calendar month has been completed, a supplier must determine whether any coliform treatment technique triggers specified in Section 611.1059 have been exceeded. If any trigger has been exceeded, the supplier must complete assessments as required by Section 611.1059.

4) Seasonal System Suppliers ~~system suppliers.~~

A) All seasonal system suppliers must demonstrate completion of an Agency-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

B) The Agency may, by a SEP, exempt any seasonal system supplier from some or all of the requirements for seasonal system suppliers if the supplier's entire distribution system remains pressurized during the entire period that the supplier's system is not operating.

b) Routine Monitoring Frequency ~~monitoring frequency~~ for Total Coliforms ~~total coliforms~~. A Subpart B system supplier (including a consecutive system supplier) must monitor monthly. A supplier may not reduce monitoring.

c) Unfiltered Subpart B System Suppliers ~~system suppliers~~. A Subpart B system supplier that does not practice filtration in compliance with Subparts B, R, X, and Z must collect at least one total coliform sample near the first service connection each day that the turbidity level of the source water, measured as specified in Section 611.532(b), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the supplier must collect this coliform sample within 24 hours after the first exceedance, unless the Agency determines that the supplier, for logistical reasons outside the supplier's control, cannot have the sample analyzed within 30 hours after collection, and the Agency identifies an alternative sample collection schedule. Sample results from the coliform monitoring required by this subsection (c) must be included in determining whether the coliform treatment technique trigger in Section 611.1059 has been exceeded.

BOARD NOTE: Derived from 40 CFR 141.856~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1057 Routine Monitoring Requirements for PWSs That Serve More Than 1,000 People

a) General~~.~~

1) The provisions of this Section apply to public water systems serving more than 1,000 persons.

2) Following any total coliform-positive sample taken under the provisions of this Section, the supplier must comply with the repeat monitoring requirements and E. coli analytical requirements in Section 611.1058.

3) Once all monitoring required by this Section and Section 611.1058 for a calendar month has been completed, a supplier must determine whether any coliform treatment technique triggers specified in Section 611.1059 have been exceeded. If any trigger has been exceeded, the supplier must complete assessments as required by Section 611.1059.

4) Seasonal Systems~~ systems.~~

A) A seasonal system supplier must demonstrate completion of an Agency-approved start-up procedure, which may include a requirement for start-up sampling prior to serving water to the public.

B) The Agency may, by a SEP, exempt any seasonal system supplier from some or all of the requirements for seasonal system suppliers if the supplier's entire distribution system remains pressurized during the entire period that the supplier's system is not operating.

b) Monitoring Frequency ~~frequency~~ for Total Coliforms~~ total coliforms~~. The monitoring frequency for total coliforms is based on the population served by the supplier's system, as follows:

Total Coliform Monitoring Frequency for Public Water Systems
Serving More Than 1,000 People

~~TOTAL COLIFORM MONITORING FREQUENCY FOR PUBLIC WATER SYSTEMS SERVING MORE THAN 1,000 PEOPLE~~

Population served	Minimum number of samples per month
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150

320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

c) Unfiltered Subpart B Systems ~~systems~~. A Subpart B system supplier that does not practice filtration in compliance with Subparts B, R, X, and Z must collect at least one total coliform sample near the first service connection each day that the turbidity level of the source water, measured as specified in Section 611.532(b), exceeds 1 NTU. When one or more turbidity measurements in any day exceed 1 NTU, the supplier must collect this coliform sample within 24 hours after the first exceedance, unless the Agency determines that the supplier, for logistical reasons outside the supplier's control, cannot have the sample analyzed within 30 hours after collection, and the Agency identifies an alternative sample collection schedule. Sample results from this coliform monitoring must be included in determining whether the coliform treatment technique trigger in Section 611.1059 has been exceeded.

d) Reduced Monitoring ~~monitoring~~. A supplier may not reduce monitoring, except for a non-CWS supplier that uses only ground water (and not ground water under the direct influence of surface water) and which serves 1,000 or fewer people in some months and more than 1,000 persons in other months. In months when more than 1,000 persons are served, the supplier must monitor at the frequency specified in subsection (a). In months when the supplier serves 1,000 or fewer people, the Agency may, by a SEP, reduce the monitoring frequency, in writing, to a frequency allowed under Section 611.1054 for a similarly situated supplier that always serves 1,000 or fewer people, taking into account the provisions in Section 611.1054(e) through (g).

BOARD NOTE: Derived from 40 CFR 141.857 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1058 Repeat Monitoring and E. coli Requirements

a) Repeat Monitoring ~~monitoring.~~

1) If a sample taken under Sections 611.1054 though 611.1057 is total coliform-positive, the supplier must collect a set of repeat samples within 24 hours after being notified of the positive result. The supplier must collect no fewer than three repeat samples for each total coliform-positive sample found. The Agency may, by a SEP, extend the 24- hour limit on a case-by-case basis if the supplier has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Alternatively, the Agency may implement criteria for the supplier to use in lieu of case-by-case extensions. In the case of an extension, the Agency must specify how much time the supplier has to collect the repeat samples. The Agency cannot waive the requirement for a supplier to collect repeat samples in subsections (a)(1) through (a)(3).

2) The supplier must collect all repeat samples on the same day, except that the Agency may, by a SEP, allow a supplier with a single service connection to collect the required set of repeat samples over a three-day period or to collect a larger volume repeat samples in one or more sample containers of any size, as long as the total volume collected is at least 300 mℓ.

3) The supplier must collect an additional set of repeat samples in the manner specified in subsections (a)(1) through (a)(3) if one or more repeat samples in the current set of repeat samples is total coliform-positive. The supplier must collect the additional set of repeat samples within 24 hours after being notified of the positive result, unless the Agency extends the limit as provided in subsection (a)(1). The supplier must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the supplier determines that a coliform treatment technique trigger specified in Section 611.1059(a) has been exceeded as a result of a repeat sample being total coliform-positive and notifies the Agency. If a trigger identified in Section 611.1059 is exceeded as a result of a routine sample being total coliform-positive, the supplier is required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

4) After a supplier collects a routine sample and before it learns the results of the analysis of that sample, if the supplier collects another routine sample from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the system may count the subsequent sample as a repeat sample instead of as a routine sample.

5) Results of all routine and repeat samples taken under Sections 611.1054 through 611.1058 not invalidated by the Agency must be used to determine whether a coliform treatment technique trigger specified in Section 611.1059 has been exceeded.

b) Escherichia coli (E. coli) Testing ~~testing.~~

1) If any routine or repeat sample is total coliform-positive, the supplier must analyze that total coliform-positive culture medium to determine if E. coli are present. If E. coli are present, the supplier must notify the Agency by the end of the day when the supplier is notified of the test result, unless the supplier is notified of the result after the Agency office is closed and the Agency does not have either an after-hours phone line or an alternative notification procedure, in which case the supplier must notify the Agency before the end of the next business day.

2) The Agency has the discretion to allow a supplier, on a case-by-case basis, to forego E. coli testing on a total coliform-positive sample if that supplier assumes that the total coliform-positive sample is E. coli-positive. Accordingly, the supplier must notify the Agency as specified in subsection (b)(1) and the provisions of Section 141.63(c) apply.

BOARD NOTE: Derived from 40 CFR 141.858 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1059 Coliform Treatment Technique Triggers and Assessment Requirements for Protection Against Potential Fecal Contamination

a) Treatment Technique Triggers ~~technique triggers~~. A supplier must conduct assessments in accordance with subsection (b) after exceeding treatment technique triggers in subsections (a)(1) and (a)(2).

1) Level 1 Treatment Technique Triggers ~~treatment technique triggers.~~

A) For a supplier taking 40 or more samples per month, the supplier exceeds 5.0% total coliform-positive samples for the month.

B) For a supplier taking fewer than 40 samples per month, the supplier has two or more total coliform-positive samples in the same month.

C) The supplier fails to take every required repeat sample after any single total coliform-positive sample.

2) Level 2 Treatment Technique Triggers ~~treatment technique triggers.~~

A) An E. coli MCL violation, as specified in Section 611.1060(a).

B) A second Level 1 trigger as defined in subsection (a)(1), within a rolling 12-month period, unless the Agency, by a SEP, has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the supplier has corrected the problem.

C) For a supplier with approved annual monitoring, a Level 1 trigger in two consecutive years.

b) Requirements for Assessments ~~assessments.~~

1) A supplier must ensure that Level 1 and Level 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 2 assessments must be conducted by parties approved by the Agency.

2) When conducting assessments, the supplier must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small ground water systems); and existing water quality monitoring data. The supplier must conduct the assessment consistent with any Agency directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

3) Level 1 Assessments ~~assessments~~. A supplier must conduct a Level 1 assessment consistent with Agency requirements if the supplier exceeds one of the treatment technique triggers in subsection (a)(1).

A) The supplier must complete a Level 1 assessment as soon as practical after any trigger in subsection (a)(1). In the completed assessment form, the supplier must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified. The supplier must submit the completed Level 1 assessment form to the Agency within 30 days after the supplier learns that it has exceeded a trigger.

B) If the Agency reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Agency must consult with the supplier. If the

Agency, by a SEP, requires revisions after consultation, the supplier must submit a revised assessment form to the Agency on an agreed-upon schedule not to exceed 30 days from the date of the consultation.

C) Upon completion and submission of the assessment form by the supplier, the Agency must determine if the supplier has identified a likely cause for the Level 1 trigger and, if so, establish that the supplier has corrected the problem, or has included a schedule acceptable to the Agency for correcting the problem.

4) Level 2 Assessments ~~assessments~~. A supplier must ensure that a Level 2 assessment consistent with Agency requirements is conducted if the supplier exceeds one of the treatment technique triggers in subsection (a)(2). The supplier must comply with any expedited actions or additional actions required by the Agency, by a SEP, in the case of an E. coli MCL violation.

A) The supplier must ensure that a Level 2 assessment is completed by the Agency or by a party approved by the Agency as soon as practical after any trigger in subsection (a)(2). The supplier must submit a completed Level 2 assessment form to the Agency within 30 days after the supplier learns that it has exceeded a trigger. The assessment form must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The assessment form may also note that no sanitary defects were identified.

B) The supplier may conduct Level 2 assessments if the supplier has staff or management with the certification or qualifications specified by the Agency unless otherwise directed by the Agency, by a SEP.

C) If the Agency reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the Agency must consult with the system. If the Agency requires revisions after consultation, the supplier must submit a revised assessment form to the Agency on an agreed-upon schedule not to exceed 30 days.

D) Upon completion and submission of the assessment form by the supplier, the Agency must determine if the system has identified a likely cause for the Level 2 trigger and determine whether the supplier has corrected the problem, or has included a schedule acceptable to the Agency for correcting the problem.

c) Corrective Action ~~action~~. A supplier must correct sanitary defects found through either Level 1 or 2 assessments conducted under subsection (b). For corrections not completed by the time of submission of the assessment form, the supplier must complete the corrective actions in compliance with a timetable approved by the Agency, by a SEP, in consultation with the supplier. The supplier must notify the Agency when each scheduled corrective action is completed.

d) Consultation. At any time during the assessment or corrective action phase, either the water supplier or the Agency may request a consultation with the other party to determine the appropriate actions to be taken. The supplier may consult with the Agency on all relevant information that may impact on its ability to comply with a requirement of this Subpart AA, including the method of accomplishment, an appropriate timeframe, and other relevant information.

BOARD NOTE: Derived from 40 CFR 141.859 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1060 Violations

a) E. coli MCL Violations ~~violations~~. A supplier is in violation of the MCL for E. coli when any of the conditions identified in subsections (a)(1) through (a)(4) occur.

1) The supplier has an E. coli-positive repeat sample following a total coliform-positive routine sample.

2) The supplier has a total coliform-positive repeat sample following an E. coli-positive routine sample.

3) The supplier fails to take all required repeat samples following an E. coli-positive routine sample.

4) The supplier fails to test for E. coli when any repeat sample tests positive for total coliform.

b) Treatment Technique Violation ~~technique violation.~~

1) A treatment technique violation occurs when a supplier exceeds a treatment technique trigger specified in Section 611.1059(a) and then fails to conduct the required assessment or corrective actions within the timeframe specified in Section 611.1059(b) and (c).

2) A treatment technique violation occurs when a seasonal system supplier fails to complete an Agency-approved start-up procedure prior to serving water to the public.

c) Monitoring Violations ~~violations.~~

1) Failure to take every required routine or additional routine sample in a compliance period is a monitoring violation.

2) Failure to analyze for E. coli following a total coliform-positive routine sample is a monitoring violation.

d) Reporting Violations ~~violations.~~

1) Failure to submit a monitoring report or completed assessment form after a supplier properly conducts monitoring or assessment in a timely manner is a reporting violation.

2) Failure to notify the Agency following an E. coli-positive sample as required by Section 611.1058(b)(1) in a timely manner is a reporting violation.

3) Failure to submit certification of completion of Agency-approved start-up procedure by a seasonal system is a reporting violation.

BOARD NOTE: Derived from 40 CFR 141.860 ~~(2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.1061 Reporting and Recordkeeping

a) Reporting~~.~~

1) E. coli~~.~~

A) A supplier must notify the Agency by the end of the day when the system learns of an E. coli MCL violation, unless the supplier learns of the violation after the Agency office is closed and the Agency does not have either an after-hours phone line or an alternative notification procedure, in which case the supplier must notify the Agency before the end of the next business day, and the supplier notifies the public in accordance with Subpart V ~~of this Part~~.

B) A supplier must notify the Agency by the end of the day when the supplier is notified of an E. coli-positive routine sample, unless the supplier is notified of the result after the Agency office is closed and the Agency does not have either an after-hours phone line or an alternative notification procedure, in which case the supplier must notify the Agency before the end of the next business day.

2) A supplier that has violated the treatment technique for coliforms in Section 611.1059 must report the violation to the Agency no later than the end of the next business day after it learns of the violation, and notify the

public in accordance with Subpart V~~ of this Part~~.

3) A supplier required to conduct an assessment under the provisions of Section 611.1059 must submit the assessment report within 30 days. The supplier must notify the Agency in accordance with Section 611.1059(c) when each scheduled corrective action is completed for corrections not completed by the time of submission of the assessment form.

4) A supplier that has failed to comply with a coliform monitoring requirement must report the monitoring violation to the Agency within ten ~~10~~ days after the supplier discovers the violation, and notify the public in accordance with Subpart V~~ of this Part~~.

5) A seasonal system supplier must certify, prior to serving water to the public, that it has complied with the Agency-approved start-up procedure.

b) Recordkeeping~~.~~

1) The supplier must maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under Section 611.1059 for Agency review. This record must be maintained by the supplier for a period not less than five years after completion of the assessment or corrective action.

2) The supplier must maintain a record of any repeat sample taken that meets Agency criteria for an extension of the 24-hour ~~24- hour~~ period for collecting repeat samples as provided for under Section 611.1058(a)(1).

BOARD NOTE: Derived from 40 CFR 141.861~~ (2014)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.APPENDIX A Regulated Contaminants

Microbiological Contaminants~~ contaminants.~~

Contaminant (units): Total Coliform Bacteria
Traditional MCL in mg/ℓ: TT
To convert for CCR, multiply by: —
MCL in CCR units: TT
MCLG: N/A
Major sources in drinking water: Naturally present in the environment.
Health effects language: Use language found in Section 611.883(h)(7)(A)(i)

Contaminant (units): E. coli

Traditional MCL in mg/ℓ: Routine and repeat samples are total coliform-positive and either is E. coli-positive or system fails to take repeat samples following E. coli-positive routine sample or system fails to analyze total coliform-positive repeat sample for E. coli.
To convert for CCR, multiply by: —
MCL in CCR units: Routine and repeat samples are total coliform-positive and either is E. coli-positive or system fails to take repeat samples following E. coli-positive routine sample or system fails to analyze total coliform-positive repeat sample for E. coli.
MCLG: 0
Major sources in drinking water: Human and animal fecal waste.
Health effects language: E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, the elderly, and people with severely-compromised immune systems.

Contaminant (units): Fecal Indicators (enterococci or coliphage).
Traditional MCL in mg/ℓ: TT.
To convert for CCR, multiply by: —
MCL in CCR units: TT.
MCLG: N/A
Major sources in drinking water: Human and animal fecal waste.
Health effects language: Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

Contaminant (units): Total organic carbon (ppm)
Traditional MCL in mg/ℓ: TT
To convert for CCR, multiply by: —
MCL in CCR units: TT
MCLG: N/A
Major sources in drinking water: Naturally present in the environment.
Health effects language: Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.

Contaminant (units): Turbidity (NTU)
Traditional MCL in mg/ℓ: TT
To convert for CCR, multiply by: —
MCL in CCR units: TT

MCLG: N/A
Major sources in drinking water: Soil runoff.
Health effects language: Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Radioactive Contaminants ~~contaminants.~~

Contaminant (units): Beta/photon emitters (mrem/yr)
Traditional MCL in mg/ℓ: 4 mrem/yr
To convert for CCR, multiply by: —
MCL in CCR units: 4
MCLG: 0
Major sources in drinking water: Decay of natural and man-made deposits.
Health effects language: Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Alpha emitters (pCi/ℓ)
Traditional MCL in mg/ℓ: 15 pCi/ℓ
To convert for CCR, multiply by: —
MCL in CCR units: 15
MCLG: 0
Major sources in drinking water: Erosion of natural deposits.
Health effects language: Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Combined radium (pCi/ℓ)
Traditional MCL in mg/ℓ: 5 pCi/ℓ
To convert for CCR, multiply by: —
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Erosion of natural deposits.
Health effects language: Some people who drink water containing radium-226 or -228 in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Uranium (μg/ℓ)
Traditional MCL in mg/ℓ: 30 μg/ℓ
To convert for CCR, multiply by: —
MCL in CCR units: 30
MCLG: 0
Major sources in drinking water: Erosion of natural deposits.

Health effects language: Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

Inorganic Contaminants ~~contaminants.~~

Contaminant (units): Antimony (ppb)
Traditional MCL in mg/ℓ: 0.006
To convert for CCR, multiply by: 1000
MCL in CCR units: 6
MCLG: 6
Major sources in drinking water: Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.
Health effects language: Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

Contaminant (units): Arsenic (ppb)
Traditional MCL in mg/ℓ: 0.010
To convert for CCR, multiply by: 1000
MCL in CCR units: 50
MCLG: 0
Major sources in drinking water: Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes.
Health effects language: Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

Contaminant (units): Asbestos (MFL)
Traditional MCL in mg/ℓ: 7 MFL
To convert for CCR, multiply by: —
MCL in CCR units: 7
MCLG: 7
Major sources in drinking water: Decay of asbestos cement water mains; erosion of natural deposits.
Health effects language: Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.

Contaminant (units): Barium (ppm)
Traditional MCL in mg/ℓ: 2
To convert for CCR, multiply by: —
MCL in CCR units: 2
MCLG: 2
Major sources in drinking water: Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.

Health effects language: Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.

Contaminant (units): Beryllium (ppb)
Traditional MCL in mg/ℓ: 0.004
To convert for CCR, multiply by: 1000
MCL in CCR units: 4
MCLG: 4
Major sources in drinking water: Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries.
Health effects language: Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.

Contaminant (units): Bromate (ppb)
Traditional MCL in mg/ℓ: 0.010
To convert for CCR, multiply by: 1000
MCL in CCR units: 10
MCLG: 0
Major sources in drinking water: By-product of drinking water disinfection.
Health effects language: Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Cadmium (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 5
Major sources in drinking water: Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints.
Health effects language: Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

Contaminant (units): Chloramines (ppm)
Traditional MCL in mg/ℓ: MRDL=4
To convert for CCR, multiply by: —
MCL in CCR units: MRDL=4
MCLG: MRDLG=4
Major sources in drinking water: Water additive used to control microbes.
Health effects language: Some people who drink water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.

Contaminant (units): Chlorine (ppm)
Traditional MCL in mg/ℓ: MRDL=4
To convert for CCR, multiply by: —
MCL in CCR units: MRDL=4

MCLG: MRDLG=4
Major sources in drinking water: Water additive used to control microbes.
Health effects language: Some people who drink water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.

Contaminant (units): Chlorine dioxide (ppb)
Traditional MCL in mg/ℓ: MRDL=800
To convert for CCR, multiply by: 1000
MCL in CCR units: MRDL=800
MCLG: MRDLG=800
Major sources in drinking water: Water additive used to control microbes.
Health effects language: Some infants and young children who drink water containing chlorine dioxide well in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.

Contaminant (units): Chlorite (ppm)
Traditional MCL in mg/ℓ: MRDL=1
To convert for CCR, multiply by: —
MCL in CCR units: MRDL=1
MCLG: MRDLG=0.8
Major sources in drinking water: By-product of drinking water disinfection.
Health effects language: Some infants and young children who drink water containing chlorite well in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

Contaminant (units): Chromium (ppb)
Traditional MCL in mg/ℓ: 0.1
To convert for CCR, multiply by: 1000
MCL in CCR units: 100
MCLG: 100
Major sources in drinking water: Discharge from steel and pulp mills; erosion of natural deposits.
Health effects language: Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

Contaminant (units): Copper (ppm)
Traditional MCL in mg/ℓ: AL=1.3
To convert for CCR, multiply by: —
MCL in CCR units: AL=1.3
MCLG: 1.3
Major sources in drinking water: Corrosion of household plumbing systems; erosion of natural deposits.

Health effects language: Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

Contaminant (units): Cyanide (ppb)
Traditional MCL in mg/ℓ: 0.2
To convert for CCR, multiply by: 1000
MCL in CCR units: 200
MCLG: 200
Major sources in drinking water: Discharge from steel/metal factories; discharge from plastic and fertilizer factories.
Health effects language: Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.

Contaminant (units): Fluoride (ppm)
Traditional MCL in mg/ℓ: 4
To convert for CCR, multiply by: —
MCL in CCR units: 4
MCLG: 4
Major sources in drinking water: Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories.
Health effects language: Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

Contaminant (units): Lead (ppb)
Traditional MCL in mg/ℓ: AL=0.015
To convert for CCR, multiply by: 1000
MCL in CCR units: AL=15
MCLG: 0
Major sources in drinking water: Corrosion of household plumbing systems; erosion of natural deposits.
Health effects language: Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

Contaminant (units): Mercury (inorganic) (ppb)
Traditional MCL in mg/ℓ: 0.002

To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 2
Major sources in drinking water: Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland.
Health effects language: Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.

Contaminant (units): Nitrate (ppm)
Traditional MCL in mg/ℓ: 10
To convert for CCR, multiply by: —
MCL in CCR units: 10
MCLG: 10
Major sources in drinking water: Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Health effects language: Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Contaminant (units): Nitrite (ppm)
Traditional MCL in mg/ℓ: 1
To convert for CCR, multiply by: —
MCL in CCR units: 1
MCLG: 1
Major sources in drinking water: Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Health effects language: Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Contaminant (units): Selenium (ppb)
Traditional MCL in mg/ℓ: 0.05
To convert for CCR, multiply by: 1000
MCL in CCR units: 50
MCLG: 50
Major sources in drinking water: Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines.
Health effects language: Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.

Contaminant (units): Thallium (ppb)
Traditional MCL in mg/ℓ: 0.002
To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 0.5

Major sources in drinking water: Leaching from ore-processing sites; discharge from electronics, glass, and drug factories.
Health effects language: Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

Synthetic Organic Contaminants Including Pesticides ~~organic contaminants including pesticides~~ and Herbicides ~~herbicides.~~

Contaminant (units): 2,4-D (ppb)
Traditional MCL in mg/ℓ: 0.07
To convert for CCR, multiply by: 1000
MCL in CCR units: 70
MCLG: 70
Major sources in drinking water: Runoff from herbicide used on row crops.
Health effects language: Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.

Contaminant (units): 2,4,5-TP (silvex) (ppb)
Traditional MCL in mg/ℓ: 0.05
To convert for CCR, multiply by: 1000
MCL in CCR units: 50
MCLG: 50
Major sources in drinking water: Residue of banned herbicide.
Health effects language: Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.

Contaminant (units): Acrylamide
Traditional MCL in mg/ℓ: TT
To convert for CCR, multiply by: —
MCL in CCR units: TT
MCLG: 0
Major sources in drinking water: Added to water during sewage/wastewater treatment.
Health effects language: Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.

Contaminant (units): Alachlor (ppb)
Traditional MCL in mg/ℓ: 0.002
To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 0
Major sources in drinking water: Runoff from herbicide used on row crops.
Health effects language: Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

Contaminant (units): Atrazine (ppb)
Traditional MCL in mg/ℓ: 0.003
To convert for CCR, multiply by: 1000
MCL in CCR units: 3
MCLG: 3
Major sources in drinking water: Runoff from herbicide used on row crops.
Health effects language: Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.

Contaminant (units): Benzo(a)pyrene (PAH) (nanograms/ℓ)
Traditional MCL in mg/ℓ: 0.0002
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 200
MCLG: 0
Major sources in drinking water: Leaching from linings of water storage tanks and distribution lines.
Health effects language: Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.

Contaminant (units): Carbofuran (ppb)
Traditional MCL in mg/ℓ: 0.04
To convert for CCR, multiply by: 1000
MCL in CCR units: 40
MCLG: 40
Major sources in drinking water: Leaching of soil fumigant used on rice and alfalfa.
Health effects language: Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.

Contaminant (units): Chlordane (ppb)
Traditional MCL in mg/ℓ: 0.002
To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 0
Major sources in drinking water: Residue of banned termiticide.
Health effects language: Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.

Contaminant (units): Dalapon (ppb)
Traditional MCL in mg/ℓ: 0.2
To convert for CCR, multiply by: 1000
MCL in CCR units: 200
MCLG: 200
Major sources in drinking water: Runoff from herbicide used on rights of way.

Health effects language: Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.

Contaminant (units): Di(2-ethylhexyl)adipate (ppb)
Traditional MCL in mg/ℓ: 0.4
To convert for CCR, multiply by: 1000
MCL in CCR units: 400
MCLG: 400
Major sources in drinking water: Discharge from chemical factories.
Health effects language: Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience toxic effects, such as weight loss, liver enlargement, or possible reproductive difficulties.

Contaminant (units): Di(2-ethylhexyl)phthalate (ppb)
Traditional MCL in mg/ℓ: 0.006
To convert for CCR, multiply by: 1000
MCL in CCR units: 6
MCLG: 0
Major sources in drinking water: Discharge from rubber and chemical factories.
Health effects language: Some people who drink water containing di(2-ethylhexyl)phthalate well in excess of the MCL over many years may have problems with their liver or experience reproductive difficulties, and they may have an increased risk of getting cancer.

Contaminant (units): Dibromochloropropane (DBCP) (ppt)
Traditional MCL in mg/ℓ: 0.0002
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 200
MCLG: 0
Major sources in drinking water: Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.
Health effects language: Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.

Contaminant (units): Dinoseb (ppb)
Traditional MCL in mg/ℓ: 0.007
To convert for CCR, multiply by: 1000
MCL in CCR units: 7
MCLG: 7
Major sources in drinking water: Runoff from herbicide used on soybeans and vegetables.
Health effects language: Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.

Contaminant (units): Diquat (ppb)

Traditional MCL in mg/ℓ: 0.02
To convert for CCR, multiply by: 1000
MCL in CCR units: 20
MCLG: 20
Major sources in drinking water: Runoff from herbicide use.
Health effects language: Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.

Contaminant (units): Dioxin (2,3,7,8-TCDD) (ppq)
Traditional MCL in mg/ℓ: 0.00000003
To convert for CCR, multiply by: 1,000,000,000
MCL in CCR units: 30
MCLG: 0
Major sources in drinking water: Emissions from waste incineration and other combustion; discharge from chemical factories.
Health effects language: Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.

Contaminant (units): Endothall (ppb)
Traditional MCL in mg/ℓ: 0.1
To convert for CCR, multiply by: 1000
MCL in CCR units: 100
MCLG: 100
Major sources in drinking water: Runoff from herbicide use.
Health effects language: Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

Contaminant (units): Endrin (ppb)
Traditional MCL in mg/ℓ: 0.002
To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 2
Major sources in drinking water: Residue of banned insecticide.
Health effects language: Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.

Contaminant (units): Epichlorohydrin
Traditional MCL in mg/ℓ: TT
To convert for CCR, multiply by: —
MCL in CCR units: TT
MCLG: 0
Major sources in drinking water: Discharge from industrial chemical factories; an impurity of some water treatment chemicals.

Health effects language: Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

Contaminant (units): Ethylene dibromide (ppt)
Traditional MCL in mg/ℓ: 0.00005
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 50
MCLG: 0
Major sources in drinking water: Discharge from petroleum refineries.
Health effects language: Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.

Contaminant (units): Glyphosate (ppb)
Traditional MCL in mg/ℓ: 0.7
To convert for CCR, multiply by: 1000
MCL in CCR units: 700
MCLG: 700
Major sources in drinking water: Runoff from herbicide use.
Health effects language: Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.

Contaminant (units): Heptachlor (ppt)
Traditional MCL in mg/ℓ: 0.0004
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 400
MCLG: 0
Major sources in drinking water: Residue of banned pesticide.
Health effects language: Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.

Contaminant (units): Heptachlor epoxide (ppt)
Traditional MCL in mg/ℓ: 0.0002
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 200
MCLG: 0
Major sources in drinking water: Breakdown of heptachlor.
Health effects language: Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

Contaminant (units): Hexachlorobenzene (ppb)
Traditional MCL in mg/ℓ: 0.001

To convert for CCR, multiply by: 1000
MCL in CCR units: 1
MCLG: 0
Major sources in drinking water: Discharge from metal refineries and agricultural chemical factories.
Health effects language: Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.

Contaminant (units): Hexachlorocyclopentadiene (ppb)
Traditional MCL in mg/ℓ: 0.05
To convert for CCR, multiply by: 1000
MCL in CCR units: 50
MCLG: 50
Major sources in drinking water: Discharge from chemical factories.
Health effects language: Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.

Contaminant (units): Lindane (ppt)
Traditional MCL in mg/ℓ: 0.0002
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 200
MCLG: 200
Major sources in drinking water: Runoff/leaching from insecticide used on cattle, lumber, gardens.
Health effects language: Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.

Contaminant (units): Methoxychlor (ppb)
Traditional MCL in mg/ℓ: 0.04
To convert for CCR, multiply by: 1000
MCL in CCR units: 40
MCLG: 40
Major sources in drinking water: Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.
Health effects language: Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.

Contaminant (units): Oxamyl (vydate) (ppb)
Traditional MCL in mg/ℓ: 0.2
To convert for CCR, multiply by: 1000
MCL in CCR units: 200
MCLG: 200
Major sources in drinking water: Runoff/leaching from insecticide used on apples, potatoes and tomatoes.

Health effects language: Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

Contaminant (units): PCBs (polychlorinated biphenyls) (ppt)
Traditional MCL in mg/ℓ: 0.0005
To convert for CCR, multiply by: 1,000,000
MCL in CCR units: 500
MCLG: 0
Major sources in drinking water: Runoff from landfills; discharge of waste chemicals.
Health effects language: Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.

Contaminant (units): Pentachlorophenol (ppb)
Traditional MCL in mg/ℓ: 0.001
To convert for CCR, multiply by: 1000
MCL in CCR units: 1
MCLG: 0
Major sources in drinking water: Discharge from wood preserving factories.
Health effects language: Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.

Contaminant (units): Picloram (ppb)
Traditional MCL in mg/ℓ: 0.5
To convert for CCR, multiply by: 1000
MCL in CCR units: 500
MCLG: 500
Major sources in drinking water: Herbicide runoff.
Health effects language: Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.

Contaminant (units): Simazine (ppb)
Traditional MCL in mg/ℓ: 0.004
To convert for CCR, multiply by: 1000
MCL in CCR units: 4
MCLG: 4
Major sources in drinking water: Herbicide runoff.
Health effects language: Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.

Contaminant (units): Toxaphene (ppb)
Traditional MCL in mg/ℓ: 0.003
To convert for CCR, multiply by: 1000
MCL in CCR units: 3
MCLG: 0

Major sources in drinking water: Runoff/leaching from insecticide used on cotton and cattle.
Health effects language: Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.

Volatile Organic Contaminants ~~organic contaminants.~~

Contaminant (units): Benzene (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from factories; leaching from gas storage tanks and landfills.
Health effects language: Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.

Contaminant (units): Carbon tetrachloride (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from chemical plants and other industrial activities.
Health effects language: Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

Contaminant (units): Chlorobenzene (ppb)
Traditional MCL in mg/ℓ: 0.1
To convert for CCR, multiply by: 1000
MCL in CCR units: 100
MCLG: 100
Major sources in drinking water: Discharge from chemical and agricultural chemical factories.
Health effects language: Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.

Contaminant (units): o-Dichlorobenzene (ppb)
Traditional MCL in mg/ℓ: 0.6
To convert for CCR, multiply by: 1000
MCL in CCR units: 600
MCLG: 600
Major sources in drinking water: Discharge from industrial chemical factories.

Health effects language: Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.

Contaminant (units): p-Dichlorobenzene (ppb)
Traditional MCL in mg/ℓ: 0.075
To convert for CCR, multiply by: 1000
MCL in CCR units: 75
MCLG: 75
Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia; damage to their liver, kidneys, or spleen; or changes in their blood.

Contaminant (units): 1,2-Dichloroethane (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): 1,1-Dichloroethylene (ppb)
Traditional MCL in mg/ℓ: 0.007
To convert for CCR, multiply by: 1000
MCL in CCR units: 7
MCLG: 7
Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

Contaminant (units): cis-1,2-Dichloroethylene (ppb)
Traditional MCL in mg/ℓ: 0.07
To convert for CCR, multiply by: 1000
MCL in CCR units: 70
MCLG: 70
Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.

Contaminant (units): trans-1,2-Dichloroethylene (ppb)
Traditional MCL in mg/ℓ: 0.1
To convert for CCR, multiply by: 1000
MCL in CCR units: 100
MCLG: 100

Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.

Contaminant (units): Dichloromethane (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from pharmaceutical and chemical factories.
Health effects language: Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.

Contaminant (units): 1,2-Dichloropropane (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from industrial chemical factories.
Health effects language: Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Ethylbenzene (ppb)
Traditional MCL in mg/ℓ: 0.7
To convert for CCR, multiply by: 1000
MCL in CCR units: 700
MCLG: 700
Major sources in drinking water: Discharge from petroleum refineries.
Health effects language: Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

Contaminant (units): Haloacetic acids (HAA5) (ppb)
Traditional MCL in mg/ℓ: 0.060
To convert for CCR, multiply by: 1000
MCL in CCR units: 60
MCLG: N/A
Major sources in drinking water: Byproduct of drinking water disinfection.
Health effects language: Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Styrene (ppb)
Traditional MCL in mg/ℓ: 0.1
To convert for CCR, multiply by: 1000

MCL in CCR units: 100
MCLG: 100
Major sources in drinking water: Discharge from rubber and plastic factories; leaching from landfills.
Health effects language: Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.

Contaminant (units): Tetrachloroethylene (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from factories and dry cleaners.
Health effects language: Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.

Contaminant (units): 1,2,4-Trichlorobenzene (ppb)
Traditional MCL in mg/ℓ: 0.07
To convert for CCR, multiply by: 1000
MCL in CCR units: 70
MCLG: 70
Major sources in drinking water: Discharge from textile-finishing factories.
Health effects language: Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.

Contaminant (units): 1,1,1-Trichloroethane (ppb)
Traditional MCL in mg/ℓ: 0.2
To convert for CCR, multiply by: 1000
MCL in CCR units: 200
MCLG: 200
Major sources in drinking water: Discharge from metal degreasing sites and other factories.
Health effects language: Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.

Contaminant (units): 1,1,2-Trichloroethane (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 3
Major sources in drinking water: Discharge from industrial chemical factories.

Health effects language: Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.

Contaminant (units): Trichloroethylene (ppb)
Traditional MCL in mg/ℓ: 0.005
To convert for CCR, multiply by: 1000
MCL in CCR units: 5
MCLG: 0
Major sources in drinking water: Discharge from metal degreasing sites and other factories.
Health effects language: Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.

Contaminant (units): TTHMs (total trihalomethanes) (ppb)
Traditional MCL in mg/ℓ: 0.10/0.080
To convert for CCR, multiply by: 1000
MCL in CCR units: 100/80
MCLG: N/A
Major sources in drinking water: Byproduct of drinking water disinfection.
Health effects language: Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.

Contaminant (units): Toluene (ppm)
Traditional MCL in mg/ℓ: 1
To convert for CCR, multiply by: —
MCL in CCR units: 1
MCLG: 1
Major sources in drinking water: Discharge from petroleum factories.
Health effects language: Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.

Contaminant (units): Vinyl Chloride (ppb)
Traditional MCL in mg/ℓ: 0.002
To convert for CCR, multiply by: 1000
MCL in CCR units: 2
MCLG: 0
Major sources in drinking water: Leaching from PVC piping; discharge from plastics factories.
Health effects language: Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

Contaminant (units): Xylenes (ppm)

Traditional MCL in mg/ℓ: 10
To convert for CCR, multiply by: —
MCL in CCR units: 10
MCLG: 10
Major sources in drinking water: Discharge from petroleum factories; discharge from chemical factories.
Health effects language: Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

Key~~.~~

Abbreviation	Meaning
AL	action level
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MFL	million fibers per liter
MRDL	maximum residual disinfectant level
MRDLG	maximum residual disinfectant level goal
mrem/year	millirems per year (a measure of radiation absorbed by the body)
N/A	not applicable
NTU	nephelometric turbidity units(a measure of water clarity)
pCi/ℓ	picocuries per liter (a measure of radioactivity)
ppm	parts per million, or milligrams per liter (mg/ℓ)
ppb	parts per billion, or micrograms per liter (μg/ℓ)
ppt	parts per trillion, or nanograms per liter
ppq	parts per quadrillion, or picograms per liter
TT	treatment technique

BOARD NOTE: Derived from appendix A to subpart O to 40 CFR 141~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.APPENDIX G NPDWR Violations and Situations Requiring Public Notice

See note 1 at the end of this Appendix G for an explanation of the Agency's authority to alter the magnitude of a violation from that set forth in the following table.

	MCL/MRDL/TT violations[2]		Monitoring and testing procedure violations	
Contaminant	Tier of public notice required	Citation	Tier of public notice required	Citation

I. Violations of National Primary Drinking Water Regulations (NPDWR):[3]

A. Microbiological Contaminants

1a. Corresponding row 1a in appendix A to subpart Q to 40 CFR 141 no longer applies by its own terms. This statement maintains structural consistency with the federal regulations.				
1b. Total coliform (TT violations resulting from failure to perform assessments or corrective actions, monitoring violations, and reporting violations)	2	611.1060(b)(1)	3	611.1060(c)(1) 611.1060(d)(1)
1c. Seasonal system failure to follow State-approved start-up plan prior to serving water to the public or failure to provide certification to the Agency	2	611.1060(b)(2)	3	611.1060(d)(3)
2a. Corresponding row 2a in appendix A to subpart Q to 40 CFR 141 no longer applies by its own terms. This statement maintains structural consistency with the federal regulations.				
2b. E. coli (MCL, monitoring, and reporting violations)	1	611.1060(a)	3	611.1060(c), 611.1060(d)(2)
2c. E.coli (TT violations resulting from failure to perform Level 2 assessments or corrective action)	2	611.1060(b)(1)		

3. Turbidity MCL	2	611.320(a)	3	611.560
4. Turbidity MCL (average of two days' samples greater than 5 NTU)	[5] 2, 1	611.320(b)	3	611.560
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6] 2, 1	611.231(b), 611.233(b)(1), 611.250(a)(2), 611.250(b)(2), 611.250(c)(2), 611.250(d), 611.743(a)(2), 611.743(b), 611.955(b)(2)	3	611.531(a), 611.532(b), 611.533(a), 611.744, 611.956(a)(1)-(a)(3), 611.956(b)
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT)	2	611.211, 611.213, 611.220, 611.230-611.233, 611.240-611.242, 611.250	3	611.531-611.533
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT)	2	[7] 611.740-611.743, 611.950-611.955	3	611.742, 611.744, 611.953, 611.954, 611.956
8. Filter Backwash Recycling Rule violations	2	611.276(c)	3	611.276(b), (d)
9. Long Term 1 Enhanced Surface Water Treatment Rule violations	2	611.950-611.955	3	611.953, 611.954, 611.956
10. LT2ESWTR violations	2	611.1010-611.1020	[19] 2, 3	611.1001-611.1005 and 611.1008-611.1009
11. Groundwater Rule violations	2	611.804	3	611.802(h)

B. Inorganic Chemicals (IOCs)

1. Antimony	2	611.301(b)	3	611.600, 611.601, 611.603
2. Arsenic	2	611.301(b)	3	611.601, 611.603
3. Asbestos (fibers greater than 10 μm)	2	611.301(b)	3	611.600, 611.601, 611.602
4. Barium	2	611.301(b)	3	611.600, 611.601, 611.603
5. Beryllium	2	611.301(b)	3	611.600, 611.601, 611.603
6. Cadmium	2	611.301(b)	3	611.600, 611.601, 611.603
7. Chromium (total)	2	611.301(b)	3	611.600, 611.601, 611.603
8. Cyanide	2	611.301(b)	3	611.600, 611.601, 611.603
9. Fluoride	2	611.301(b)	3	611.600, 611.601, 611.603
10. Mercury (inorganic)	2	611.301(b)	3	611.600, 611.601, 611.603
11. Nitrate	1	611.301(b)	[8] 1, 3	611.600, 611.601, 611.604, 611.606

12. Nitrite	1	611.301(b)	[8] 1, 3	611.600, 611.601, 611.605, 611.606
13. Total Nitrate and Nitrite	1	611.301(b)	3	611.600, 611.601
14. Selenium	2	611.301(b)	3	611.600, 611.601, 611.603
15. Thallium	2	611.301(b)	3	611.600, 611.601, 611.603

C. Lead and Copper Rule (Action Level for lead is 0.015 mg/ℓ, for copper is 1.3 mg/ℓ)

1. Lead and Copper Rule (TT)	2	611.350-611.355	3	611.356-611.359

D. Synthetic Organic Chemicals (SOCs)

1. 2,4-D	2	611.311(c)	3	611.648
2. 2,4,5-TP (silvex)	2	611.311(c)	3	611.648
3. Alachlor	2	611.311(c)	3	611.648
4. Atrazine	2	611.311(c)	3	611.648
5. Benzo(a)pyrene (PAHs)	2	611.311(c)	3	611.648
6. Carbofuran	2	611.311(c)	3	611.648
7. Chlordane	2	611.311(c)	3	611.648
8. Dalapon	2	611.311(c)	3	611.648
9. Di(2-ethylhexyl)adipate	2	611.311(c)	3	611.648
10. Di(2-ethylhexyl)phthalate	2	611.311(c)	3	611.648
11. Dibromochloropropane (DBCP)	2	611.311(c)	3	611.648

12. Dinoseb	2	611.311(c)	3	611.648
13. Dioxin (2,3,7,8-TCDD)	2	611.311(c)	3	611.648
14. Diquat	2	611.311(c)	3	611.648
15. Endothall	2	611.311(c)	3	611.648
16. Endrin	2	611.311(c)	3	611.648
17. Ethylene dibromide	2	611.311(c)	3	611.648
18. Glyphosate	2	611.311(c)	3	611.648
19. Heptachlor	2	611.311(c)	3	611.648
20. Heptachlor epoxide	2	611.311(c)	3	611.648
21. Hexachlorobenzene	2	611.311(c)	3	611.648
22. Hexachlorocyclopentadiene	2	611.311(c)	3	611.648
23. Lindane	2	611.311(c)	3	611.648
24. Methoxychlor	2	611.311(c)	3	611.648
25. Oxamyl (Vydate)	2	611.311(c)	3	611.648
26. Pentachlorophenol	2	611.311(c)	3	611.648
27. Picloram	2	611.311(c)	3	611.648
28. Polychlorinated biphenyls (PCBs)	2	611.311(c)	3	611.648
29. Simazine	2	611.311(c)	3	611.648
30. Toxaphene	2	611.311(c)	3	611.648

E. Volatile Organic Chemicals (VOCs)

1. Benzene	2	611.311(a)	3	611.646
2. Carbon tetrachloride	2	611.311(a)	3	611.646
3. Chlorobenzene (monochlorobenzene)	2	611.311(a)	3	611.646

4. o-Dichlorobenzene	2	611.311(a)	3	611.646
5. p-Dichlorobenzene	2	611.311(a)	3	611.646
6. 1,2-Dichloroethane	2	611.311(a)	3	611.646
7. 1,1-Dichloroethylene	2	611.311(a)	3	611.646
8. cis-1,2-Dichloroethylene	2	611.311(a)	3	611.646
9. trans-1,2-Dichloroethylene	2	611.311(a)	3	611.646
10. Dichloromethane	2	611.311(a)	3	611.646
11. 1,2-Dichloropropane	2	611.311(a)	3	611.646
12. Ethylbenzene	2	611.311(a)	3	611.646
13. Styrene	2	611.311(a)	3	611.646
14. Tetrachloroethylene	2	611.311(a)	3	611.646
15. Toluene	2	611.311(a)	3	611.646
16. 1,2,4-Trichlorobenzene	2	611.311(a)	3	611.646
17. 1,1,1-Trichloroethane	2	611.311(a)	3	611.646
18. 1,1,2-Trichloroethane	2	611.311(a)	3	611.646
19. Trichloroethylene	2	611.311(a)	3	611.646
20. Vinyl chloride	2	611.311(a)	3	611.646
21. Xylenes (total)	2	611.311(a)	3	611.646

F. Radioactive Contaminants

1. Beta/photon emitters	2	611.330(d)	3	611.720(a), 611.732
2. Alpha emitters	2	611.330(c)	3	611.720(a), 611.731
3. Combined radium (226 and 228)	2	611.330(b)	3	611.720(a), 611.731

4. Uranium	2	611.330(e)	3	611.720(a), 611.731

G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals. Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). USEPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).[13]

1. Total trihalomethanes (TTHMs)	2	[11]611.312(b)	3	Subparts W and Y
2. Haloacetic Acids (HAA5)	2	611.312(b)	3	Subpart Y
3. Bromate	2	611.312(a)	3	611.382(a)-(b)
4. Chlorite	2	611.312(a)	3	611.382(a)-(b)
5. Chlorine (MRDL)	2	611.313(a)	3	611.382(a), (c)
6. Chloramine (MRDL)	2	611.313(a)	3	611.382(a), (c)
7. Chlorine dioxide (MRDL), where any two consecutive daily samples at entrance to distribution system only are above MRDL	2	611.313(a), 611.383(c)(3)	2[12], 3	611.382(a), (c), 611.383(c)(2)
8. Chlorine dioxide (MRDL), where samples in distribution system the next day are also above MRDL	[13]1	611.313(a), 611.383(c)(3)	1	611.382(a), (c), 611.383(c)(2)
9. Control of DBP precursors—TOC (TT)	2	611.385(a)-(b)	3	611.382(a), (d)
10. Benchmarking and disinfection profiling	N/A	N/A	3	611.742, 611.953, 611.954
11. Development of monitoring plan	N/A	N/A	3	611.382(f)

H. Other Treatment Techniques

1. Acrylamide (TT)	2	611.296	N/A	N/A
2. Epichlorohydrin (TT)	2	611.296	N/A	N/A

II. Unregulated Contaminant Monitoring: [14]

A. Unregulated contaminants	N/A	N/A	3	as required by USEPA under ~~pursuant to~~ 40 CFR 141.40
B. Nickel	N/A	N/A	3	611.603, 611.611

III. Public Notification for Relief Equivalent to a SDWA section 1415 Variance or a section 1416 Exemption.

A. Operation under relief equivalent to a SDWA section 1415 variance or a section 1416 exemption	3	[15] 1415, 1416	N/A	N/A
B. Violation of conditions of relief equivalent to a SDWA section 1415 variance or a section 1416 exemption	2	1415, 1416, [16] 611.111, 611.112	N/A	N/A

IV. Other Situations Requiring Public Notification.

A. Fluoride secondary maximum contaminant level (SMCL) exceedance	3	611.858	N/A	N/A
B. Exceedance of nitrate MCL for a non-CWS supplier, as allowed by the Agency	1	611.300(d)	N/A	N/A
C. Availability of unregulated contaminant monitoring data	3	as required by USEPA under ~~pursuant to~~ 40 CFR 141.40	N/A	N/A

D. Waterborne disease outbreak	1	611.101, 611.233(b)(2)	N/A	N/A
E. Other waterborne emergency[17]	1	N/A	N/A	N/A
F. Source water sample positive for Groundwater Rule fecal indicators: E. coli, enterococci, or coliphage	1	611.802(g)	N/A	N/A
G. Other situations as determined by the Agency by a SEP issued under ~~pursuant to~~ Section 611.110	[18]1, 2, 3	N/A	N/A	N/A

Appendix G—Endnotes

1. Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports) do not require notice, unless otherwise determined by the Agency by a SEP. The Agency may, by a SEP, further require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under Sections 611.902(a) and 611.903(a).

2. Definition of the abbreviations used: "MCL" means maximum contaminant level, "MRDL" means maximum residual disinfectant level, and "TT" means treatment technique.

3. The term "violations of National Primary Drinking Water Regulations (NPDWR)" is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

4. Failure to test for fecal coliform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3 violations.

5. A supplier that violates the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days must consult with the Agency within 24 hours after learning of the violation. Based on this consultation, the Agency may subsequently decide to issue a SEP that elevates the violation to a Tier 1 violation. If a supplier is unable to make contact with the Agency in the 24-hour period, the violation is automatically elevated to a Tier 1 violation.

6. A supplier with a treatment technique violation involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR), or the Long Term 1 Enhanced Surface Water Treatment Rule are required to consult with the Agency within 24 hours after learning of the violation. Based on this consultation, the Agency may subsequently decide

to issue a SEP that elevates the violation to a Tier 1 violation. If a supplier is unable to make contact with the Agency in the 24-hour period, the violation is automatically elevated to a Tier 1 violation.

7. The Surface Water Treatment Rule (SWTR) remains in effect for a supplier that serves at least 10,000 persons; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supersede the SWTR.

8. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

9. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

10. A Subpart B community or non-transient non-community system supplier must comply with new DBP MCLs, disinfectant MRDLs, and related monitoring requirements. A Subpart B transient non-community system supplier that serves10,000 or more persons that uses chlorine dioxide as a disinfectant or oxidant or a Subpart B transient non-community system supplier that serves fewer than 10,000 persons, which uses only groundwater not under the direct influence of surface water, and which uses chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL.

11. Sections 611.312(b)(1) and 611.382(a) and (b) apply until Subpart Y takes effect under the schedule set forth in Section 611.970(c).

12. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.

13. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. A failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.

14. Some water suppliers must monitor for certain unregulated contaminants as required by USEPA under 40 CFR 141.40.

15. This citation refers to sections 1415 and 1416 of the federal Safe Drinking Water Act. sections 1415 and 1416 require that "a schedule prescribed . . . for a public water system granted relief equivalent to a SDWA section 1415 variance or a section 1416 exemption must require compliance by the system . . .."

16. In addition to sections 1415 and 1416 of the federal Safe Drinking Water Act, 40 CFR 142.307 specifies the items and schedule milestones that must be included in relief equivalent to a SDWA section 1415 small system variance. In granting any form of relief from an NPDWR, the Board will consider all applicable federal requirements for and

limitations on the State's ability to grant relief consistent with federal law.

17. Other waterborne emergencies require a Tier 1 public notice under Section 611.902(a) for situations that do not meet the definition of a waterborne disease outbreak given in Section 611.101, but which still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

18. The Agency may place any other situation in any tier it deems appropriate in writing, based on the prospective threat which it determines that the situation poses to public health, and subject to Board review under Section 40 of the Act.

19. A failure to collect three or more samples for Cryptosporidium analysis is a Tier 2 violation requiring special notice, as specified in Section 611.911. All other monitoring and testing procedure violations are Tier 3.

BOARD NOTE: Derived from appendix A to subpart Q of 40 CFR 141~~ (2016)~~.

(Source: Amended at 44 Ill. Reg. ________, effective ______________________)

Section 611.TABLE A Total Coliform Monitoring Frequency (Repealed)

~~TOTAL COLIFORM MONITORING FREQUENCY FOR CWSs~~

~~Population Served~~			~~Minimum Number of Samples per Month~~
~~25~~	~~to~~	~~1000~~	~~1~~
~~1001~~	~~to~~	~~2500~~	~~2~~
~~2501~~	~~to~~	~~3300~~	~~3~~
~~3301~~	~~to~~	~~4100~~	~~4~~
~~4101~~	~~to~~	~~4900~~	~~5~~
~~4901~~	~~to~~	~~5800~~	~~6~~
~~5801~~	~~to~~	~~6700~~	~~7~~
~~6701~~	~~to~~	~~7600~~	~~8~~
~~7601~~	~~to~~	~~8500~~	~~9~~

~~8501~~	~~to~~	~~12,900~~	~~10~~
~~12,901~~	~~to~~	~~17,200~~	~~15~~
~~17,201~~	~~to~~	~~21,500~~	~~20~~
~~21,501~~	~~to~~	~~25,000~~	~~25~~
~~25,001~~	~~to~~	~~33,000~~	~~30~~
~~33,001~~	~~to~~	~~41,000~~	~~40~~
~~41,001~~	~~to~~	~~50,000~~	~~50~~
~~50,001~~	~~to~~	~~59,000~~	~~60~~
~~59,001~~	~~to~~	~~70,000~~	~~70~~
~~70,001~~	~~to~~	~~83,000~~	~~80~~
~~83,001~~	~~to~~	~~96,000~~	~~90~~
~~96,001~~	~~to~~	~~130,000~~	~~100~~
~~130,001~~	~~to~~	~~220,000~~	~~120~~
~~220,001~~	~~to~~	~~320,000~~	~~150~~
~~320,001~~	~~to~~	~~450,000~~	~~180~~
~~450,001~~	~~to~~	~~600,000~~	~~210~~
~~600,001~~	~~to~~	~~780,000~~	~~240~~
~~780,001~~	~~to~~	~~970,000~~	~~270~~
~~970,001~~	~~to~~	~~1,230,000~~	~~300~~
~~1,230,001~~	~~to~~	~~1,520,000~~	~~330~~
~~1,520,001~~	~~to~~	~~1,850,000~~	~~360~~
~~1,850,001~~	~~to~~	~~2,270,000~~	~~390~~
~~2,270,001~~	~~to~~	~~3,020,000~~	~~420~~
~~3,020,001~~	~~to~~	~~3,960,000~~	~~450~~
~~3,960,001~~	~~or~~	~~more~~	~~480~~

~~PWSs that have at least 15 service connections, but serve fewer than 25 persons are included are included in the entry for 25 to 1000 persons served.~~

~~BOARD NOTE: Derived from 40 CFR 141.21(a)(2) (2012).~~

(Source: Repealed at 44 Ill. Reg. ________, effective ______________________)