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

PART 611
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 35 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")). ~~For the purposes of regulation of supplies by Public Health by reference to this Part,~~ "Agency" will mean ~~the Department of~~ 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) (2009)~~(2007)~~. 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 of this Part.

"Bin classification" or "bin" means, for the purposes of Subpart Z of this Part, the appropriate of the four treatment categories (Bin 1, Bin 2, Bin 3, or Bin 4) that is assigned to a filtered system supplier 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 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."

"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 "$CT_{99.9}$.")

"$CT_{99.9}$" is the CT value required for 99.9 percent (3-log) inactivation of Giardia lamblia cysts. $CT_{99.9}$ for a variety of disinfectants and conditions appear in Tables 1.1-1.6, 2.1 and 3.1 of Appendix B of this Part. (See "Inactivation Ratio.")
BOARD NOTE: Derived from the definition of "CT" in 40 CFR 141.2 (2009)~~(2007)~~.

"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 3.05 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 ends December 31, 2010; the third begins 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, 1993to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999to 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.

"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 but not limited to 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, but are not limited to, 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 of this Part and determining compliance with the TTHM and HAA5 MCLs under Subpart Y of this Part.

"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 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) (2009)~~(2007)~~.

"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 of this Part 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) and 141.24(f)(2) note and 40 CFR 141.400(b) (2009)~~(2007)~~.

"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(c).

"Hydrogeologic sensitivity assessment," for the purposes of Subpart S of this Part, 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) (2009)~~(2007)~~.

"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:

$$B = \Sigma(Ai)$$

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 (2009)~~(2007)~~.

"Initial compliance period" means the three-year compliance period that begins 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 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 of this Part.
BOARD NOTE: Derived from 40 CFR 141.601(c) (2009)~~(2007)~~.

"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) (2009)~~(2007)~~.

"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.

"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 "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NCRP Report Number 22, 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 [415 ILCS 5/17.5].

"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) (2009)~~(2007)~~.

"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: Drawn from 40 CFR 141.23(b)(2) and 141.24(f)(2) note (2009)~~(2007)~~.

"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 of this Part, 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~~The Department of Public Health ("Public Health") regulates non-community water supplies ("non-CWSs," including non-transient, non-community water supplies ("NTNCWSs") and transient non-community water supplies ("transient non-CWSs")). For the purposes of regulation of supplies by Public Health by reference to this Part,~~ "Agency" in this Section~~must mean Public Health~~.

"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 of this Part, "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 (2009)~~(2007)~~. These radioactive contaminants must be reported in Consumer Confidence Reports under Subpart U of this Part 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) (2009)~~(2007)~~.

"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 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) (2009)~~(2007)~~.

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

"SEP" means special exception permit (Section 611.110).

"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) (2000)).

"Significant deficiency" means a deficiency identified by the Agency in a groundwater system pursuant to Section 611.803. A significant deficiency might include, but is not limited to, 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) (2009)~~(2007)~~. 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, polychlorinated 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 (2009)~~(2007)~~ 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) (2006)~~(2007)~~).

"Standard monitoring" means the monitoring, performed by the supplier 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) (2009)~~(2007)~~.

"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 of this Part and the analytical and monitoring requirements of Sections 611.531, 611.532, 611.533, Appendix B of this Part, and Appendix C of this Part.

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

"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 of this Part.

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

"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 (2009)~~(2007)~~.

"System-specific study plan" means the plan, submitted by the supplier to the Agency 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 (2009)~~(2007)~~.

"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 3.28 of the Act [415 ILCS 5/3.28].) 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, but is not limited to, aeration, coagulation, sedimentation, filtration, activated carbon treatment, disinfection, 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 of this Part applicable to a supplier that serves fewer than 500 persons and which has taken TTHM and HAA5 samples pursuant to Subpart I of this Part.
BOARD NOTE: Derived from 40 CFR 141.604 (2009)~~(2007)~~.

"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 (pursuant to Section 17.1 of the Act [415 ILCS 5/17.1]) 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 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) (2009)~~(2007)~~. The wellhead protection program includes the "groundwater protection needs assessment" under Section 17.1 of the Act [415 ILCS 5/17.1] and 35 Ill. Adm. Code 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 (2009)~~(2007)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

Section 611.102 Incorporations by Reference

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.

"ASTM Method" means a method published by and available from the American Society for Testing and Materials (ASTM).

"Colisure Test" means "Colisure Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia Coli in Drinking Water," available from Millipore Corporation, Technical Services Department.

"Colitag® Test" means "Colitag® Product as a Test for Detection and Identification of Coliforms and E. coli Bacteria in Drinking Water and Source Water as Required in National Primary Drinking Water Regulations," available from CPI International.

"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 Chemicals Inc.

"Determination of Inorganic Oxyhalide" means "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," available from NTIS.

"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.

"EC-MUG" means "Method 9221 F: Multiple-Tube Fermentation Technique for Members of the Coliform Group, Escherichia coli Procedure (Proposed)," available from American Public Health Association and American Waterworks Association.

"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," Revision 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.

~~"HASL Procedure Manual" means HASL Procedure Manual, HASL 300, available from ERDA Health and Safety Laboratory.~~

"ITS Method D99-003" means Method D99-003, Revision 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," Revision 1.2, ~~August 2001, EPA 821/B-01/009,~~ available from ~~the National Technical Information Service (~~NTIS~~)~~.

"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 ~~and USEPA, Water Resource Center~~.

"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" means "Determination of Turbidity by Laser Nephelometry," available from NEMI and Leck Mitchell, PhD.

"Mitchell Method M5331" means "Determination of Turbidity by LED Nephelometry," available from NEMI and Leck Mitchell, PhD.

"Modified Colitag™ Method" means "Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in Water," available from NEMI and CPI International.

~~"Membrane Filter Technique using Chromocult Doliform Agar" 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 Chemicals Inc.~~

"NA-MUG" means "Method 9222 G: Membrane Filter Technique for Members of the Coliform Group, MF Partition Procedures," available from American Public Health Association and American Waterworks Association.

"NCRP Report Number 22" means "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," available from NCRP. ~~"National Council on Radiation Protection."~~

~~"NTIS" means "National Technical Information Service."~~

"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.

"ONPG-MUG Test" (meaning "minimal medium ortho-nitrophenyl-beta-d-galactopyranoside-4-methyl-umbelliferyl -beta-d-glucuronide test"), also called the "Autoanalysis Colilert System," is Method 9223, available in "Standard Methods for the Examination of Water and Wastewater," 18th, 19th, 20th, or 21st ed., from American Public Health Association and the American Water Works Association.

"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 "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® 2000 ~~Coliforms 100 Presence/Absence Test~~" means "Readycult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and Escherichia coli in Finished Waters," v. 1.0, available from EMD Chemicals Inc.

"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 Chemicals Inc.

"SimPlate Method" means "IDEXX SimPlate TM HPC Test Method for Heterotrophs in Water," available from IDEXX Laboratories, Inc.

~~"Radiochemical Methods" means "Interim Radiochemical Methodology for Drinking Water," available from NTIS.~~

"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 Analytical Technology, Inc.

~~"Technical Notes on Drinking Water Methods" means the USEPA document by that title, October 1994, USEPA document number EPA 600/R-94/173, available from NTIS.~~

"Technicon Methods" means "Fluoride in Water and Wastewater," available from Bran & Luebbe.

~~"USDOE Manual" means "EML Procedures Manual," available from the United State Department of Energy.~~

"USEPA Asbestos Method~~Methods~~ 100.1" means Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water," September 1983, available from NTIS.

"USEPA Asbestos Method~~Methods~~ 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~~Inorganics~~ 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. Available from NTIS.

"USEPA Method 1600" means "Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl-b-D-Glucoside Agar (mEI)," available from 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 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 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 USEPA, Water Resource Center.

"USEPA NERL Method 200.5 (rev. 4.2)" means Method 200.5, Revision 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 ~~the~~ USEPA, Office of Research and Development.

"USEPA NERL Method 415.3 (rev. 1.1)" means Method 415.3, Revision 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 ~~the~~ USEPA, Office of Research and Development.

"USEPA NERL Method 415.3 (rev. 1.2)" means Method 415.3, Revision 1.2, "Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water," USEPA, August 2009, EPA 600/R-09/122. Available from USEPA, Office of Research and Development.

"USEPA NERL Method 549.2" means Method 549.2, Revision 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 USEPA, Office of Research and Development.

"USEPA OGWDW Methods" means one of 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, 515.4 (rev. 1.0), 524.3 (rev. 1.0), 531.2 (rev. 1.0), 552.3 (rev. 1.0), 557, 1622 (99), 1622 (01), 1622 (05), 1623 (99), 1623 (01), and 1623 (05)). Available from NTIS; USEPA, NSCEP; or USEPA, OGWDW.

"USEPA Organic Methods" means "Methods for the Determination of Organic Compounds in Drinking Water," December 1988 (revised July

1991)~~, for~~ (Methods ~~502.2, 505, 507, 508,~~ 508A~~,~~ (rev. 1.0) and 515.1~~, and 531.1~~ (rev. 4.0)); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement I," July 1990~~, for~~ (Methods ~~506,~~ 547, 550, and 550.1~~, and 551~~); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement II," August 1992~~, for~~ (Methods ~~504.1, 508.1, 515.2, 524.2, 525.2,~~ 548.1 (rev. 1.0), ~~549.1,~~ 552.1 (rev. 1.0), ~~552.2,~~ and 555 (rev. 1.0)); and "Methods for the Determination of Organic Compounds in Drinking Water – Supplement III," August 1995~~, for~~ (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 NTIS; USEPA, NSCEP; or 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. Available from NTIS.

"USEPA Radioactivity Methods" means "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA 600/4-80/032, August 1980. Available from NTIS.

"USEPA Radiochemical Analyses" means "Radiochemical Analytical Procedures for Analysis of Environmental Samples," March 1979. Available from NTIS.

"USEPA Radiochemistry Procedures~~Methods~~" means "Radiochemistry Procedures Manual," EPA 520/5-84/006, December 1987. Available from NTIS.

"USEPA Technical Notes" means "Technical Notes on Drinking Water Methods," available from NTIS and USEPA, NSCEP.

"USGS Methods" means "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.

"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.

"Method OIA-1677 DW, Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," EPA 821/R-04/001, January 2004 (referred to as "OI Analytical Method OIA-1677"), 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, 1015 Fifteenth Street NW, Washington, DC 20005 202-777-2742.

"Standard Methods for the Examination of Water and Wastewater," 17th Edition, 1989 (referred to as "Standard Methods, 17th ed."). See the methods listed separately for the same references under American Waterworks Association.

"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 (collectively referred to as "Standard Methods, 18th ed."). See the methods listed separately for the same references under American Waterworks Association.

"Standard Methods for the Examination of Water and Wastewater," 19th Edition, 1995 (referred to as "Standard Methods, 19th ed."). See the methods listed separately for the same references under American Waterworks Association.

"Standard Methods for the Examination of Water and Wastewater," 20th Edition, 1998 (referred to as "Standard Methods, 20th ed."). See the methods listed separately for the same references under American Waterworks Association.

"Standard Methods for the Examination of Water and Wastewater," 21st Edition, 2005 (referred to as "Standard Methods, 21st ed."). 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:

"Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters," Applied and Environmental Microbiology, Oct. 1996, vol. 62, no. 10, p. 3881 (referred to as "Enterolert"), 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~~D 6503-99~~ (superceded) and ASTM Method D6503-99~~D 6503-99~~. 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).

"National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and Escherichia coli for Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method," S.C. Edberg, M.J. Allen & D.B. Smith, Applied Environmental Microbiology, vol. 54, iss. 6, pp 1595-1601 (1988), referenced in Appendix D to this Part.

"Standard Methods for the Examination of Water and Wastewater," 13th Edition, 1971 (referred to as "Standard Methods, 13th ed.").

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 for the Examination of Water and Wastewater," 17th Edition, 1989 (referred to as "Standard Methods, 17th ed.").

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 for the Examination of Water and Wastewater," 18th Edition, 1992 (referred to as "Standard Methods, 18 th ed.").

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-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-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-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, 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 Sections 611.526 and 611.531.

Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Sections 611.526 and 611.531.

Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Sections 611.526 and 611.531.

Method 9221 D, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Presence-Absence (P-

A) Coliform Test, referenced in Section 611.526.

Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Sections 611.526 and 611.531.

Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Sections 611.526 and 611.531.

Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Sections 611.526 and 611.531.

Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Sections 611.526 and 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 "Autoanalysis Colilert System" and "Colisure Test"), referenced in Sections 611.526, and 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 for the Examination of Water and Wastewater," 19th Edition, 1995 (referred to as "Standard Methods, 19th ed.").

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 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 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, Glyphosate Herbicide (Proposed), 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 B, Gamma-Emitting Radionuclides, Gamma Spectrometric Method, 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 Sections 611.526 and 611.531.

Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total

Coliform Fermentation Technique, referenced in Sections 611.526 and 611.531.

Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Sections 611.526 and 611.531.

Method 9221 D, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Presence-Absence (P-A) Coliform Test, referenced in Section 611.526.

Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Sections 611.526 and 611.531.

Method 9222 A, Membrane Filter Technique for Members of the Coliform Group, Introduction, referenced in Sections 611.526 and 611.531.

Method 9222 B, Membrane Filter Technique for Members of the Coliform Group, Standard Total Coliform Membrane Filter Procedure, referenced in Sections 611.526 and 611.531.

Method 9222 C, Membrane Filter Technique for Members of the Coliform Group, Delayed-Incubation Total Coliform Procedure, referenced in Sections 611.526 and 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 9222 G, Membrane Filter Technique for Members of the Coliform Group, MF Partition Procedures, referenced in Section 611.526.

Method 9223, Chromogenic Substrate Coliform Test (also referred to as the variations "Autoanalysis Colilert System" and "Colisure Test"), referenced in Sections 611.526, and 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 for the Examination of Water and Wastewater," 20th Edition, 1998 (referred to as "Standard Methods, 20th ed.").

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 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-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-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-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 C, Silica, Molybdosilicate Method, referenced in Section 611.611.

Method 4500-Si D, Silica, Heteropoly Blue Method, referenced in Section 611.611.

Method 4500-Si 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 Sections 611.381 and 611.382.

Method 6251, Disinfection By-Products: Haloacetic Acids and Trichlorophenol, referenced in Section 611.381.

Method 6610, Carbamate Pesticide Method, referenced in Section 611.645.

Method 6651, Glyphosate Herbicide (Proposed), 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 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 Sections 611.526 and 611.531.

Method 9221 B, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Standard Total Coliform Fermentation Technique, referenced in Sections 611.526 and 611.531.

Method 9221 C, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Estimation of Bacterial Density, referenced in Sections 611.526 and 611.531.

Method 9221 D, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Presence-Absence (P-A) Coliform Test, referenced in Sections 611.526.

Method 9221 E, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Fecal Coliform Procedure, referenced in Sections 611.526 and 611.531.

Method 9221 F, Multiple-Tube Fermentation Technique for Members of the Coliform Group, Escherichia Coli Procedure (Proposed), referenced in Section 611.802.

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Method 4500-Cl E, Chlorine, Low-Level Amperometric Titration Method, referenced in Section 611.381.

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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.

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Mitchell Method M5271, "Determination of Turbidity by Laser Nephelometry," March 2009, referenced in Section 611.531. See also Leck Mitchell, PhD, PE.

Mitchell Method M5331, "Determination of Turbidity by LED Nephelometry," March 2009, referenced in Section 611.531. See also Leck Mitchell, PhD, PE

Modified Colitag™ Method, "Modified Colitag™ Test Method for Simultaneous Detection of E. coli and other Total Coliforms in Water (ATP D05-0035)," August 2009, referenced in Sections 611.526 and 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 (referred to as "Palintest ChloroSense"), referenced in Sections 611.381 and 611.531. See also Palintest.

"Systea Easy (1-Reagent) Nitrate Method," referenced in Section 611.611. See also Systea Scientific, LLC.

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, 5285 Port Royal Road, Springfield, VA 22161 (703-487-4600 or 800-553-6847).

Dioxin and Furan Method 1613, Revision B, "Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS," October 1994, Revision B, EPA 821/B-94/005, Doc. No. 94-104774, referenced in Section 611.645. See also USEPA, NSCEP.

~~"Interim Radiochemical Methodology for Drinking Water," EPA 600/4-75-008 (revised), March 1976 (referred to as "USEPA Interim Radiochemical Methods"), referenced in Section 611.720. (Pages 1, 4, 6, 9, 13, 16, 24, 29, 34)~~

Kelada 01, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate," Revision 1.2, August 2001, EPA 821/B-01-009 ~~(referred to as "Kelada 01")~~, referenced in Section 611.611.

"Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS (National Bureau of Standards) Handbook 69, as amended August 1963, U.S. Department of Commerce, referenced in Section 611.330.

~~Method 100.1, "Analytical Method for Determination of Asbestos Fibers in Water," EPA 600/4-83-043, September 1983, Doc. No. PB83-260471 (referred to as "USEPA Asbestos Methods 100.1"), referenced in Section 611.611.~~

~~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 (referred to as "USEPA Asbestos Methods 100.2"), referenced in Section 611.611.~~

~~"Methods for Chemical Analysis of Water and Wastes," March 1983, EPA 600/4-79-020, Doc. No. PB84-128677 (referred to as "USEPA Inorganic Methods"). (Methods 150.1, 150.2, and 245.2, which formerly appeared in this reference, are available from USEPA EMSL.), referenced in Section 611.611.~~

~~"Methods for the Determination of Inorganic Substances in Environmental Samples," August 1993, EPA 600/R-93-100, Doc. No. PB94-120821 (referred to as "USEPA Environmental Inorganic Methods"), referenced in Sections 611.381, 611.531, and 611.611. (For methods 180.1, 300.0, 335.4, 353.2, and 365.1.)~~

~~"Methods for the Determination of Metals in Environmental Samples," June 1991, EPA 600/4-91-010, Doc. No. PB91-231498 and "Methods for the Determination of Metals in Environmental Samples – Supplement I," May 1994, EPA 600/R-94-111, Doc. No. PB95-125472 (referred to as "USEPA Environmental Metals Methods"), referenced in Sections 611.611, 611.612, and 611.720. (For methods 200.7, 200.8, 200.9, and 245.1.)~~

~~"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 (referred to as "USEPA Organic and Inorganic Methods"), referenced in Section 611.381. (For methods 300.1 and 321.8.)~~

~~"Methods for the Determination of Organic Compounds in Drinking Water," December 1988, revised July 1991, EPA 600/4-88/039, Doc. No. PB91-231480 (referred to as "USEPA Organic Methods"), referenced in Sections 611.645 and 611.648. (For methods 502.2, 505, 507, 508, 508A, 515.1, and 531.1.)~~

~~"Methods for the Determination of Organic Compounds in Drinking Water – Supplement I," July 1990, EPA 600/4-90/020, Doc. No. PB91-146027 (referred to as "USEPA Organic Methods"), referenced in Section 611.645. (For methods 506, 547, 550, 550.1, and 551.)~~

~~"Methods for the Determination of Organic Compounds in Drinking Water – Supplement II," August 1992, EPA 600/R-92/129, Doc. No. PB92-207703 (referred to as "USEPA Organic Methods"), referenced in Sections 611.381 and 611.645. (For methods 515.2, 524.2, 548.1, 549.1, 552.1, and 555.)~~

~~"Methods for the Determination of Organic Compounds in Drinking Water – Supplement III," August 1995, EPA 600/R-95/131, Doc. No. PB95-261616, (referred to as "USEPA Organic Methods"), referenced in Sections 611.381 and 611.645. (For methods 502.2, 524.2, 551.1, and 552.2.)~~

~~"Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA 600/4-80/032, August 1980 (Doc. No. PB 80-224744) (referred to as "USEPA Radioactivity Methods"), referenced in Section 611.720. (For methods 900, 901, 901.1, 902, 903, 903.1, 904, 905, 906, 908, 908.1)~~

"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.

~~"Radiochemical Analytical Procedures for Analysis of Environmental Samples," March 1979, Doc. No. EMSL-LV 053917 (referred to as "USEPA Radiochemical Analyses"), referenced in Section 611.720. (Pages 1, 19, 33, 65, 87, 92)~~

~~"Radiochemistry Procedures Manual," EPA 520/5-84-006, August 1984, Doc. No. PB84-215581 (referred to as "USEPA Radiochemistry Methods"), referenced in Section 611.720. (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04)~~

~~"Technical Notes on Drinking Water Methods," EPA 600/R-94/173, October 1994, Doc. No. PB95-104766 (referred to as "USEPA Technical Notes"), referenced in Sections 611.531, 611.611, and 611.685.~~

~~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) (2007): "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."~~

~~"Method 1613: Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS," October 1994, EPA 821/B-94/005, Doc. No. 94-104774 (referred to as "Dioxin and Furan Method 1613"), referenced in Section 611.645.~~

~~USEPA Method 326.0, Revision 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, Doc. No. PB2003-107402 (referred to as "OGWDW Methods, Method 326.0, rev. 1.0"), referenced in Sections 611.381 and 611.382.~~
~~BOARD NOTE: Also available from United States Environmental Protection Agency, Office of Ground Water and Drinking Water.~~

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 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 USEPA, NSCEP.

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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 611.611, 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.) See also USEPA, NSCEP.

USEPA Inorganic Methods, "Methods for Chemical Analysis of Water and Wastes," March 1983, EPA 600/4-79-020, Doc. No. PB84-128677 (referred to as "") (Methods 150.1, 150.2, and 245.2 only.), referenced in Section 611.611. See also 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.

USEPA OGWDW Methods, Method 326.0, Revision 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 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 Section 611.381. (For methods 300.1 (rev. 1.0) and 321.8 (rev. 1.0).) See also 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, 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.) See also 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). See also 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.)

USEPA Radiochemistry Procedures, "Radiochemistry Procedures Manual," EPA 520/5-84-006, August 1984, Doc. No. PB84-215581 (referred to as ""), referenced in Section 611.720. (Methods 00-01, 00-02, 00-07, H-02, Ra-03, Ra-04, Ra-05, Sr-04 only.)

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) (2009): "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.

"Determination of Radium 228 in Drinking Water," August 1990 (referred to as "New Jersey Radium Method"), referenced in Section 611.720.

New York Department of Health, Radiological Sciences Institute, Center for Laboratories and Research, Empire State Plaza, Albany, NY 12201.

"Determination of Ra-226 and Ra-228 (Ra-02)," January 1980, Revised June 1982 (referred to as "New York Radium Method"), referenced in Section 611.720.

Palintest, Ltd., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY (800-835-9629).

Palintest Method 1001, "Lead in Drinking Water by Differential Pulse Anodic Stripping Voltammetry," Method 1001, August 1999 ~~(referred to as "Palintest Method 1001")~~, 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.

Standard Methods Online, available online from the Standard Methods Organization at www.standardmethods.org.

Method 6610 B-04, Carbamate Pesticides, High-Performance Liquid Chromatographic Method, referenced in Section 611.645.

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 ed., the Board cites only to Standard Methods, 21st 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 edition, are the following: 4500-P E-99, 4500-P F-99, 6640 B-01, and 9223 B-97. 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 method from either source is acceptable.

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.

Syngenta Crop Protection, Inc., 410 Swing Road, Post Office Box 18300, Greensboro, NC 27419 (336-632-6000).

"Atrazine in Drinking Water by Immunoassay," February 2001 (referred to as "Syngenta AG-625"), referenced in Section 611.645.

Systea Scientific LLC, 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523.

Systea Easy (1-Reagent), "Systea Easy (1-Reagent) Nitrate Method," February 2009, referenced in Section 611.611. See also NEMI.

Thermo Scientific, 166 Cummings Center, Beverly, MA 01915 (www.thermo.com).

Orion Method AQ4500, "Determination of Turbidity by LED Nephelometry," May 2009, referenced in Section 611.531. See also NEMI.

USDOE, EML. United States Department of Energy, ~~available at the~~ Environmental Measurements Laboratory, U.S. Department of Energy, 376 Hudson Street, New York, NY 10014-3621.

"EML Procedures Manual," HASL 300, 27th Edition, Volume 1,

1990 (referred to as "EML Procedures~~USDOE~~ Manual (27th ed.)"), referenced in Section 611.720.

"EML Procedures Manual," HASL 300, 28th ed., 1997 (referred to as "EML Procedures Manual (28th ed.)"), referenced in Section 611.720.

USEPA, EMSL. United States Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 (513-569-7586).

USEPA Interim Radiochemical Methods, "Interim Radiochemical Methodology for Drinking Water," EPA 600/4-75/008 (revised), March 1976, referenced in Section 611.720. See also 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); "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. 4.1), 524.2 (rev. 4.1), 525.2 (rev. 2.0), 551.1 (rev. 1.0), and 552.2 (rev. 1.0) only). See also NTIS and USEPA, NSCEP.

"Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," referenced in Section 611.720. See also NTIS.

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/).

Dioxin and Furan Method 1613, Revision 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.

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 Section 611.111.

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.

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.

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.) See also 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 611.611, 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.) See also 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.) See also NTIS.

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.

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.

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 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. See also USEPA, OGWDW.

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 Section 611.531. 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. 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.

USEPA OGWDW Methods, Method 557, "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion

Chromatography Electrospray Ionization Tandem Mass Spectrometry," July 2003, EPA 815/B-03/002, referenced in Sections 611.381, 611.382, and 611.645. See also 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. 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 Section 611.381. (Methods 300.1 (rev. 1.0) and 321.8 (rev. 1.0) only.) See also 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); "Methods for the Determination of Organic Compounds in Drinking Water – Supplement I," July 1990, EPA 600/4-90/020, referenced in Section 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. 4.1), 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 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. (For methods 900.0, 901, 901.1, 902, 903, 903.1, 904, 905, 906, 908, 908.1.) See also NTIS.

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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) (2007): "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".

USEPA OGWDW. United States Environmental Protection Agency, USEPA Office of Ground Water and Drinking Water (accessible on-line and available by download from http://www.epa.gov/safewater/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 Section 611.381. See also USEPA, NSCEP.

USEPA OGWDW Methods, Method 317.0, rev.~~Revision~~ 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 ~~(referred to as "OGWDW Methods, Method 317.0, rev. 2.0")~~, referenced in Section~~Sections~~ 611.381 ~~and 611.382~~. See also USEPA, NSCEP.

USEPA OGWDW Methods, Method 326.0, rev.~~Revision~~ 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 ~~(referred to as "OGWDW Methods, Method 326.0, rev. 1.0")~~, referenced in Section~~Sections~~ 611.381 ~~and 611.382~~. See also NTIS and USEPA, NSCEP.

~~BOARD NOTE: Also available from NTIS.~~

USEPA OGWDW Methods, Method 327.0, rev.~~Revision~~ 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 ~~(referred to as "OGWDW Methods, Method 327.0, rev. 1.1")~~, 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 Section 611.531. See also USEPA, NSCEP.

USEPA OGWDW Methods, Method 515.4, rev.~~Revision~~ 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") ~~(referred to as "OGWDW Methods, Method 515.4, rev. 1.0")~~, referenced in Section 611.645.

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 (referred to as "Method 524.3 (rev. 1.0)"), referenced in Sections 611.381 and 611.645.

USEPA OGWDW Methods, Method 531.2, rev.~~Revision~~ 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") ~~(referred to as "OGWDW Methods, Method 531.2, rev. 1.0")~~, referenced in Section 611.645. See also USEPA, NSCEP.

USEPA OGWDW Methods, Method 552.3, rev.~~Revision~~ 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 ~~(referred to as "OGWDW Methods, Method 552.3, rev. 1.0")~~, 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," July 2003, EPA 815/B-03/002, referenced in Sections 611.381 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 ~~(referred to as "USEPA Method 1622 (05)")~~, referenced in Sections 611.1004 and 611.1007.

USEPA OGWDW Methods, Method 1622 (01), "Method 1622: Cryptosporidium in Water by Filtration/IMS/FA," April 2001, EPA 821/R-01/026, ~~(referred to as "USEPA Method 1622 (01)"),~~ 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, ~~(referred to as "USEPA Method 1622 (99)"),~~ 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 ~~(referred to as "USEPA Method 1623 (05)")~~, referenced in Sections 611.1004 and 611.1007.

USEPA OGWDW Methods, Method 1623 (01), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA," April 2001, EPA 821/R-01/025 ~~(referred to as "USEPA Method 1623 (01)")~~, referenced in Section 611.1007.

USEPA OGWDW Methods, Method 1623 (99), "Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA," January 1999, EPA 821/R-99/006 ~~(referred to as "USEPA Method 1623 (99)")~~, referenced in Sections 611.1007.

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 NTIS.

~~United States Environmental Protection Agency, EMSL, Cincinnati, OH 45268 (513-569-7586).~~

~~"Interim Radiochemical Methodology for Drinking Water," EPA 600/4-75/008 (revised), March 1976 (referred to as "USEPA Interim Radiochemical Methods"), referenced in Section 611.720. See NTIS.~~

~~"Methods for the Determination of Organic Compounds in Drinking Water," December 1988, revised July 1991, EPA 600/4-88/039 (referred to as "USEPA Organic Methods"), referenced in Sections 611.645 and 611.648. (For methods 504.1, 508.1, and 525.2 only.) See NTIS.~~

~~"Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," referenced in Section 611.720. See 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 http://www.epa.gov/nerlcwww/ordmeth.htm).

USEPA NERL Method 200.5, rev.~~Revision~~ 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 ~~(referred to as "USEPA NERL Method 200.5")~~, referenced in Sections 611.611 and 611.612.

USEPA NERL Method 415.3, rev.~~Revision~~ 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 ~~(referred to as "USEPA NERL Method 415.3 (rev. 1.1)")~~, referenced in Section 611.381.

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," February 2005, EPA 600/R-09/122, referenced in Section 611.381.

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.

~~USEPA, Science and Technology Branch, Criteria and Standards~~

~~Division, Office of Drinking Water, Washington, D.C. 20460.~~

~~"Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems using Surface Water Sources," October 1989, referenced in Sections 611.111 and 611.212.~~

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 ~~(referred to as "E*Colite Test")~~, referenced in Section 611.802. ~~(~~See also ~~available from~~ Charm Sciences, Inc.~~).~~

m-ColiBlue24 Test, "Total Coliforms and E. coli Membrane Filtration Method with m-ColiBlue24® Broth," Method No. 10029, rev. ~~Revision~~ 2, August 17, 1999 ~~(referred to as "m-ColiBlue24 Test")~~, referenced in Section 611.802. See ~~(~~also ~~available from~~ The Hach Company~~)~~.

USEPA Method 1600, "EPA Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl-b-D-Glucoside Agar (mEI)," September 2002, EPA 821/R-02/022 ~~(referred to as "USEPA Method 1600")~~ 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.

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 ~~(referred to as "USEPA Method 1601")~~ (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1601ap01.pdf), referenced in Section 611.802.

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 ~~(referred to as~~

~~"USEPA Method 1602")~~ (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1602ap01.pdf), referenced in Section 611.802.

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 ~~(referred to as "USEPA Method 1604")~~ (accessible on-line and available by download from http://www.epa.gov/nerlcwww/1604sp02.pdf), referenced in Section 611.802.

USGS. Books and Open-File Reports Section, United States Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

Methods 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," Open File Report 93-125, 1993, or Book 5, Chapter A-1, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments," 3rd ed., Open-File Report 85-495, 1989, as appropriate (referred to as "USGS Methods").

I-1030-85, referenced in Section 611.611.

I-1601-85, referenced in Section 611.611.

I-1700-85, referenced in Section 611.611.

I-2598-85, referenced in Section 611.611.

I-2601-90, referenced in Section 611.611.

I-2700-85, referenced in Section 611.611.

I-3300-85, referenced in Section 611.611.

Methods available upon request by method number from "Methods for Determination of Radioactive Substances in Water and Fluvial Sediments," Chapter A5 in Book 5 of "Techniques of Water-Resources Investigations of the United States Geological Survey," 1997.

R-1110-76, referenced in Section 611.720.

R-1111-76, referenced in Section 611.720.

R-1120-76, referenced in Section 611.720.

R-1140-76, referenced in Section 611.720.

R-1141-76, referenced in Section 611.720.

R-1142-76, referenced in Section 611.720.

R-1160-76, referenced in Section 611.720.

R-1171-76, referenced in Section 611.720.

R-1180-76, referenced in Section 611.720.

R-1181-76, referenced in Section 611.720.

R-1182-76, referenced in Section 611.720.

Waters Corporation, Technical Services Division, 34 Maple St., Milford, MA 01757 (800-252-4752 or 508-482-2131, fax: 508-482-3625).

"Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography," Method B-1011, August 1987 (referred to as "Waters Method B-1011"), referenced in Section 611.611.

c) The Board incorporates the following federal regulations by reference:

21 CFR 333 (2009) (Topical Anti-microbial Drug Products for Over-the-Counter Human Use), referenced in Section 611.1103.

40 CFR 3.2 (2009)~~(2007)~~ (How Does This Part Provide for Electronic Reporting?), referenced in Section 611.105.

40 CFR 3.3 (2009)~~(2007)~~ (What Definitions Are Applicable to This Part?), referenced in Section 611.105.

40 CFR 3.10 (2009)~~(2007)~~ (What Are the Requirements for Electronic Reporting to EPA?), referenced in Section 611.105.

40 CFR 3.2000 (2009)~~(2007)~~ (What Are the Requirements Authorized State, Tribe, and Local Programs' Reporting Systems Must Meet?), referenced in Section 611.105.

40 CFR 136.3(a) (2009)~~(2007)~~, referenced in Section 611.1004.

Appendix B to 40 CFR 136 (2009)~~(2007)~~, referenced in Sections 611.359, 611.609, and 611.646.

40 CFR 142.20(b)(1) (2009), referenced in Section 611.112.

d) This Part incorporates no later amendments or editions.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

Section 611.105 Electronic Reporting

The submission of any document 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 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 had 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 Sate, submissions may occur only under the following circumstances:

i) As to any existing electronic document receiving system (i.e., one in use or substantially developed on or before October 13, 2005) for which an electronic reporting application has not been submitted on behalf of the Board or the Agency to USEPA pursuant to 40 CFR 3.1000, the Board or the Agency may use that system until October 13, 2007, or until such later date as USEPA has approved in writing as the extended deadline for submitting the application;

ii) As to any existing electronic document receiving system (i.e., one in use or substantially developed on or before October 13, 2005) for which an electronic reporting application has been submitted on behalf of the Board or the Agency to USEPA pursuant to 40 CFR 3.1000 on or before October 13, 2007, or on or before such later date as USEPA has approved in writing as the extended deadline for submitting the application, the Board or the Agency may use that system until USEPA disapproves its use in writing; or

iii) The Board or the Agency may use any electronic document receiving system for which USEPA has granted approval 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) of this Section:

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) of this Section, 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 or receiving any type of document as an electronic document in lieu of paper documents, the Board or the Agency must similarly cause publication of a Notice of Public Information in the Illinois Register.

BOARD NOTE: Subsection (a) of this Section is derived from 40 CFR 3.1, 3.2, 3.10, 3.20 and 3.1000 (2009) ~~as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

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 of electronic documents in lieu of paper documents to USEPA. Except as provided in subsection (a)(3) of this Section, 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) of this Section.

BOARD NOTE: Subsection (c) of this Section is derived from 40 CFR 3.2(a) and subpart B of 40 CFR 3 (2009)~~, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

d) Procedures for submission of electronic documents in lieu of 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) of this Section.

BOARD NOTE: Subsection (d) of this Section is derived from 40 CFR 3.2(b) and subpart D of 40 CFR 3 (2009)~~, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

e) Effects of submission of an electronic document in lieu of 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) of this Section is derived from 40 CFR 3.4 and 3.2000(c) (2009)~~, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

f) Public document subject to State 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 [415 ILCS 5];

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 pursuant to subsection (d)(1) of this Section will create any right or privilege to submit any document as an electronic document.

BOARD NOTE: Subsection (g) of this Section is derived from 40 CFR 3.2(c) (2009)~~, as added at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

BOARD NOTE: Derived from 40 CFR 3, as added, and 40 CFR 142.10(g) (2009)~~(2005), as amended at 70 Fed. Reg. 59848 (Oct. 13, 2005)~~.

(Source: Amended at 35 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~~-37~~ of the Act [415 ILCS 5/35-37] 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~~-37~~ of the Act

[415 ILCS 5/35-37] and Subpart B of 35 Ill. Adm. Code 104; a site-specific rule under Sections 27 and 28 ~~28~~ of the Act [415 ILCS 5/27-28] and 35 Ill. Adm. Code 102; or an adjusted standard under Section 28.1 of the Act [415 ILCS 5/28.1] 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 pursuant to this Section.

1) The PWS must file a petition 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 of this Part), 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 for 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 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 pursuant to 35 Ill. Adm. Code 102 or104.

e) The Board will not grant relief from any of the following:

1) From the MCL for total coliforms. However, the Board may grant a variance from the total coliform MCL of Section 611.325 for PWSs that prove that the violation of the total coliform MCL is due to persistent growth of total coliform in the distribution system, rather than from fecal or pathogenic contamination, from a treatment lapse or deficiency, or from

a problem in the operation or maintenance of the distribution system.

2) From any of the treatment technique requirements of Subpart B of this Part.

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 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 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 pursuant to this Section.

BOARD NOTE: Derived from 40 CFR 141.4 (2009)~~(2005)~~, from section 1415(a)(1)(A) and (a)(1)(B) of the SDWA (42 USC 300g-4(a)(1)(A) and (a)(1)(B)) and from the "Guidance Manual for ~~Compliance with the~~ Filtration and Disinfection ~~Requirements for Public Water Systems using Surface Water Sources~~," incorporated by reference in Section 611.102 and available from USEPA, NSCEP. USEPA has established a procedure at 40 CFR 142.23 (2009) ~~reserved the discretion~~ to review and potentially modify or nullify state~~Board~~ 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~~made pursuant to this Section at 40 CFR 142.23 (2005)~~.

(Source: Amended at 35 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 35 through 37~~-37~~ of the Act [415 ILCS 5/35-37] 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 35 through 37~~-37~~ of the Act [415 ILCS 5/35-37] and Subpart B of 35 Ill. Adm. Code 104; a site-specific rule under Sections 27 and 28~~-28~~ of the Act [415 ILCS 5/27-28] and 35 Ill. Adm. Code 102; or an adjusted standard under Section 28.1 of the Act [415 ILCS 5/28.1] and Subpart D of 35 Ill. Adm. 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,

pursuant to this Section.

1) The PWS must file a petition 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.

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 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 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 pursuant to section 1416 of the SDWA (42 USC 300g-5).

BOARD NOTE: Derived from section 1416 of the SDWA (42 USC 300g-5).

g) The Board will not grant relief from any of the following:

1) From the MCL for total coliforms. However, the Board may grant relief from the total coliform MCL of Section 611.325 for PWSs that prove that the violation of the total coliform MCL is due to persistent growth of total coliforms in the distribution system, rather than from fecal or pathogenic contamination, from a treatment lapse or deficiency, or from a problem in the operation or maintenance of the distribution system.

2) From any of the treatment technique requirements of Subpart B of this Part.

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 pursuant to this Section.

BOARD NOTE: Derived from 40 CFR 141.4 (2009)~~(2002)~~. USEPA has established a procedure at 40 CFR 142.23 (2009)~~reserved the discretion~~ to review and potentially modify or nullify state~~Board~~ 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~~made pursuant to this Section at 40 CFR 142.23 (2002)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART I: DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS

Section 611.381 Analytical Requirements

a) A supplier must use only the analytical methods specified in this Section or alternative methods approved by the Agency pursuant to Section 611.480 to demonstrate compliance with the requirements of this Subpart I and with the requirements of Subparts W and Y of this Part.

b) Disinfection byproducts (DBPs).

1) A supplier must measure disinfection byproducts (DBPs) by the appropriate of the following methods:

A) TTHM:

i) By purge and trap, gas chromatography, electrolytic conductivity detector, and photoionization detector: USEPA Organic Methods, Method 502.2 (rev. 2.1). If TTHMs are the only analytes being measured in the sample, then a photoionization detector is not required.

ii) By purge and trap, gas chromatography, mass spectrometer: USEPA Organic Methods, Method 524.2 (rev. 4.1).

iii) By liquid-liquid extraction, gas chromatography, electron capture detector: USEPA Organic Methods, Method 551.1 (rev. 1.0).

iv) By purge and trap, gas chromatography, mass spectrometry: USEPA OGWDW Methods, Method 524.3 (rev. 1.0).

BOARD NOTE: USEPA added USEPA OGWDW Methods, Method 524.3 (rev. 1.0) as an approved alternative method for TTHM in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 74 Fed. Reg. 38348).

B) HAA5:

i) By liquid-liquid extraction (diazomethane), gas chromatography, electron capture detector: Standard Methods, 19th or 21st ed., Method 6251 B.

~~BOARD NOTE: On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entry for HAA5 by liquid-liquid extraction (diazomethane), gas chromatography, electron capture detector, in the table at corresponding 40 CFR 141.131(b)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 6251 B (as approved in 1994). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 6251 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 6251 B from the 21st edition of Standard Methods as an approved alternative~~

~~method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) By solid phase extractor (acidic methanol), gas chromatography, electron capture detector: USEPA Organic Methods, Method 552.1 (rev. 1.0).

iii) By liquid-liquid extraction (acidic methanol), gas chromatography, electron capture detector: USEPA Organic Methods, Method 552.2 (rev. 1.0) or USEPA OGWDW Methods, Method 552.3 (rev. 1.0).

iv) By ion chromatography, electrospray ionization, tandem mass spectrometry: USEPA OGWDW Methods, Method 557.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 6251 B as an approved alternative method for HAA5 in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA OGWDW Methods, Method 557 as approved alternative methods for HAA5 in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

C) Bromate:

i) By ion chromatography: USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0).

ii) By ion chromatography and post-column reaction: USEPA OGWDW Methods, Method 317.0~~,~~ (rev 2.0), or 326.0~~,~~ (rev. 1.0).

iii) By inductively coupled plasma/mass spectrometer: USEPA Organic and Inorganic Methods, Method 321.8 (rev. 1.0).

iv) By two-dimensional ion chromatography: USEPA OGWDW Methods, Method 302.0.

v) By ion chromatography, electrospray ionization, tandem mass spectrometry: USEPA OGWDW Methods, Method 557.

vi) By chemically suppressed chromatography: ASTM Method D6581-08 A.

vii) 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 for bromate in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

D) Chlorite:

i) By amperometric titration: Standard Methods, 19th or 21st ed., Method 4500-ClO_2 E.

~~BOARD NOTE: On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entry for chlorite by amperometric titration, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-ClO_2 E (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-ClO_2 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-ClO_2 E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) By spectrophotometry: USEPA OGWDW Methods, Method 327.0~~,~~ (rev. 1.1).

iii) By ion chromatography: USEPA Environmental Inorganic Methods, Method 300.0 (rev. 2.1); USEPA Organic and Inorganic Methods, Method 300.1 (rev. 1.0); USEPA OGWDW Methods, Method 317.0~~,~~ (rev. 2.0), or 326.0~~,~~ (rev. 1.0); or ASTM Method D6581-00.

iv) By chemically suppressed chromatography: ASTM Method D6581-08 A.

v) 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 for daily chlorite in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D6581-08 A and B as approved alternative methods for chlorite in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

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 laboratories that have received certification by USEPA or the Agency except as specified under subsection (b)(3) of this Section. To receive certification to conduct analyses for the DBP contaminants listed in Sections 611.312 and 611.381 and Subparts W and Y of this Part, the laboratory must fulfill the requirements of subsections (b)(2)(A), (b)(2)(C), and (b)(2)(D) of this Section.

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) of this Section, subject to the conditions of subsections (b)(2)(C)(xii) and (b)(2)(C)(xiii) of this Section:

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) of this Section 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) of this Section 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) of this Section, subject to the limitations of subsections (b)(2)(D)(xii) and (b)(2)(D)(xiii) of this Section, for all DBP samples analyzed for compliance with Sections 611.312 and 611.385 and Subparts W and Y of this Part:

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~~, rev. 2.0,~~ or 326.0 or USEPA Organic and Inorganic Methods, Method 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) of this Section, 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.

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) of this Section, subject to the provisions of subsection (c)(1)(E) of this Section:

A) Free Chlorine:

i) Amperometric titration: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl D, or ASTM Method D1253-86~~1253-86~~, D1253-96~~1253-96~~, D1253-03, or D1253-08~~or 1253-03~~;

ii) DPD ferrous titration: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl F;

iii) DPD colorimetric: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl G; or

iv) Syringaldazine (FACTS): ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl H.

v) Test strips: ITS Method D99-003 if approved by the Agency pursuant to subsection (c)(2) of this Section.

v) Amperometric sensor: Palintest ChloroSense.

vi) On-line chlorine analyzer: USEPA OGWDW Methods, Method 334.0.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-Cl D, F, G, and H as approved alternative methods for free chlorine in appendix A to subpart C of 40 CFR 141 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 for free chlorine in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

B) Combined Chlorine:

i) Amperometric titration: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl D, or ASTM Method D1253-86~~1253-86~~, D1253-96~~1253-96~~, ~~or~~ D1253-03, or D1253-08~~1253-03~~;

ii) DPD ferrous titration: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl F; or

iii) DPD colorimetric: ~~using~~ Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl G.

BOARD NOTE: USEPA added Standard Methods, Methods 4500-Cl D, F, and G as approved alternative methods for free chlorine in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D1253-08 as an approved alternative method for combined chlorine in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

C) Total Chlorine:

i) Amperometric titration using Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl D, or ASTM Method D1253-

861253-86, D1253-961253-96, or D1253-03, or D1253-081253-03;

ii) Low-level amperometric titration: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl E;

iii) DPD ferrous titration: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl F;

iv) DPD colorimetric: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl G; or

v) Iodometric electrode: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-Cl I.

vi) Amperometric sensor: Palintest ChloroSense.

vii) On-line chlorine analyzer: USEPA OGWDW Methods, Method 334.0.

BOARD NOTE: USEPA added Standard Methods, Methods 4500-Cl D, E, F, G, and I as approved alternative methods for free chlorine in appendix A to subpart C of 40 CFR 141 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 for total chlorine in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

D) Chlorine Dioxide:

i) DPD: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-ClO_2 D;

ii) Amperometric Method II: using Standard Methods, 19th, 20th, or 21st ed., Method 4500-ClO_2 E; or

iii) Lissamine Green spectrophotometric: using USEPA OGWDW Method 327.0 (rev. 1.1).

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-ClO_2 D and E as approved alternative methods for

chlorine dioxide in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

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.

~~BOARD NOTE: On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entries for free chlorine, combined chlorine, and chlorine dioxide in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-Cl D, E, F, G, H, or I or Method 4500-ClO_2 E (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 4500-Cl and Method 4500-ClO_2 that appear in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-Cl D, E, F, G, H, or I or Method 4500-ClO_2 E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

2) Alternative methods available only upon specific approval by the Agency~~Test strips~~.

A) Test strips: ITS Method D99-003.

BOARD NOTE: USEPA added ITS Method D99-003 as an approved alternative method for free chlorine in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616), contingent upon specific 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 issued pursuant to Section 611.110, 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) of this Section must use the methods listed 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:

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)(i), (d)(3)(A)(ii), (d)(3)(A)(iii), or (d)(3)(B) of this Section, subject to the limitations of subsection (d)(3)(C) of this Section:

A) High-temperature combustion~~Standard Methods, 19th, 20th, or 21st ed., using one of the following methods~~:

i) Standard Methods, 19th, 20th, or 21st ed., Method 5310 B ~~(High-Temperature Combustion Method)~~; or

ii) USEPA NERL Method 415.3 (rev. 1.2).~~Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method); or~~

~~iii) Method 5310 D (Wet-Oxidation Method).~~

~~BOARD NOTE: On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entries for total organic carbon, high-temperature combustion, persulfate-ultraviolet or heated-persulfate, and wet oxidation at corresponding 40 CFR 141.131(d)(3) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 5310 B, C, or D (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of~~

~~Method 5310 B, C, or D that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 5310 B, C, or D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Persulfate-ultraviolet or heated – persulfate oxidation:

i) Standard Methods, 19th, 20th, or 21st ed., Method 5310 C; or

ii) USEPA NERL Method 415.3 (rev. 1.2).

C) Wet Oxidation Method:

i) Standard Methods, 19th, 20th, or 21st ed., Method 5310 D; or

ii) USEPA NERL Method 415.3 (rev. 1.2).

D~~B~~) Specific UV_{254} absorbance: USEPA NERL Method~~Method~~ 415.3 (rev. 1.1) or 415.3 (rev. 1.2).

E~~C~~) 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 for total organic carbon in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method for total organic carbon in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

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) of this Section to measure DOC and the method stipulated in subsection (d)(4)(B) of this Section 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). ~~Standard Methods, 19th ed., 20th ed., or 21st ed., Method 5310 B (High-Temperature Combustion Method), Method 5310 C (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method), or Method 5310 D (Wet-Oxidation Method) or USEPA NERL Method 415.3 (rev. 1.1).~~ 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.~~; and~~

i) High-Temperature Combustion Method: Standard Methods, 19th ed., 20th ed., or 21st ed., Method 5310 B or USEPA NERL Methods 415.3 (rev. 1.1) or 415.3 (rev. 1.2).

ii) Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method, Method 5310 C or USEPA NERL Methods 415.3 (rev. 1.1) or 415.3 (rev. 1.2).

iii) Wet-Oxidation Method: Standard Methods, 19th ed., 20th ed., or 21st ed., Method 5310 D or USEPA NERL Methods 415.3 (rev. 1.1) or 415.3 (rev. 1.2).

BOARD NOTE: ~~On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entries for specific ultraviolet absorbance-dissolved organic carbon at corresponding 40 CFR 141.131(d)(4)(i) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 5310 B, C, or D (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 5310 B, C, or D that appears in that printed volume is that~~

~~cited by USEPA as acceptable for use. USEPA later added Method 5310 B, C, or D from the 21st edition of Standard Methods~~ USEPA added Standard Methods, Methods 5310 B, C, and D as ~~an~~ approved alternative methods for dissolved organic carbon~~method~~ in appendix A to subpart C of 40 CFR 141~~, added~~ on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method for dissolved organic carbon in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

B) Ultraviolet Absorption at 254 nm (UV_{254})~~.~~ by spectrometry: Standard Methods, 19th, 20th, or 21st ed., Method 5910 B ~~(Ultraviolet Absorption Method)~~ or USEPA NERL Method 415.3 (rev. 1.1) or 415.3 (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: ~~On January 4, 2006 (at 71 Fed. Reg. 388), USEPA amended the entries for specific ultraviolet absorbance-ultraviolet absorption at 254 nm at corresponding 40 CFR 141.131(d)(4)(ii) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 5910 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 5910 B that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 5910 B from the 21st edition of Standard Methods~~ USEPA added Standard Methods, 21st ed., Method 5910 B as an approved alternative method for ultraviolet absorbtion in appendix A to subpart C of 40 CFR 141~~, added~~ on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA NERL Method 415.3 (rev. 1.2) as an approved alternative method for ultraviolet absorbance in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

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 ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

Section 611.382 Monitoring Requirements

a) General 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) of this Section 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 for disinfection byproducts (DBPs).

1) TTHMs and HAA5.

A) Routine 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) of this Section.

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) of this Section.

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 for source water TOC. In order to qualify for reduced monitoring for TTHM and HAA5 under subsection (b)(1)(B) of this Section, a Subpart B system supplier not monitoring under the provisions of subsection (d) of this Section must take monthly TOC samples every 30 days at a location prior to any treatment, beginning no later than April 1, 2008. In addition to meeting other criteria for reduced monitoring in subsection (b)(1)(B) of this Section, 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) of this Section, 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) of this Section 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) of this Section 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.

i) Daily 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) of this Section, in addition to the sample required at the entrance to the distribution system.

ii) Monthly 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) of this Section to meet the requirement for monitoring in this subsection

(b)(2)(A)(ii).

B) Additional 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.

i) Chlorite monitoring at the entrance to the distribution system required by subsection (b)(2)(A)(i) of this Section may not be reduced.

ii) Chlorite monitoring in the distribution system required by subsection (b)(2)(A)(ii) of this Section 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) of this Section has exceeded the chlorite MCL and the supplier has not been required to conduct monitoring under subsection (b)(2)(B) of this Section. 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) of this Section exceeds the chlorite MCL or the supplier is required to conduct monitoring under subsection (b)(2)(B) of this Section, at which time the supplier must revert to routine monitoring.

3) Bromate.

A) Routine 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.

i) Until March 31, 2009, a supplier required to analyze for bromate may reduce monitoring from monthly to quarterly, if the supplier demonstrates that the average source water bromide concentration is less than 0.05 mg/ℓ based on representative monthly bromide measurements for one year. The supplier may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/ℓ based on representative monthly measurements. If the running annual average source water bromide concentration is equal to or greater than 0.05 mg/ℓ, the supplier must resume routine monitoring required by subsection (b)(3)(A) of this Section in the following month.

ii) Beginning April 1, 2009, a Subpart B system supplier may no longer use the provisions of subsection (b)(3)(B)(i) of this Section to qualify for reduced 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) of this Section for the most recent four quarters, with samples analyzed using USEPA OGWDW Methods, Method 302.0, Method 317.0 (rev. 2.0), ~~or~~ Method 326.0 (rev. 1.0), or Method 557 or USEPA Organic and Inorganic Methods, Method 321.8. If a supplier has qualified for reduced bromate monitoring under subsection (b)(3)(B)(i) of this Section, 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, Method 317.0 ~~(rev. 2.0)~~, ~~or~~ Method 326.0 ~~(rev. 1.0)~~, or Method 557 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) of this Section.

c) Monitoring requirements for disinfectant residuals.

1) Chlorine and chloramines.

A) Routine 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 Section 611.521. 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 may not be reduced.

2) Chlorine dioxide.

A) Routine 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) of this Section, in addition to the sample required at the entrance to the distribution system.

B) Additional 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 may not be reduced.

d) Monitoring requirements for disinfection byproduct (DBP) precursors.

1) Routine 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. 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. 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 (2009)~~(2006)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART L: MICROBIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.526 Analytical Methodology

a) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 mℓ.

b) Suppliers need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

c) Suppliers must conduct total coliform analyses in accordance with one of the following analytical methods, incorporated by reference in Section 611.102, or in accordance with an alternative method approved by the Agency pursuant to Section 611.480 (the time from sample collection to initiation of analysis may not exceed 30 hours, and the supplier is encouraged but not required to hold samples below 10° C during transit):

1) Total Coliform Fermentation Technique, as set forth in Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~: Methods 9221 A and B, as follows:

A) 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 10 percent;

B) 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; and

C) No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes.

2) Total Coliform Membrane Filter Technique, as set forth in Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Methods 9222 A, B, and C.

3) Presence-Absence (P-A) Coliform Test, as set forth in: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 9221 D, as follows:

A) No requirement exists to run the completed phase on 10 percent of all total coliform-positive confirmed tubes; and

B) Six-times formulation strength may be used if the medium is filter-sterilized rather than autoclaved.

4) ONPG-MUG test: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 9223. (The ONPG-MUG test is also known as the Autoanalysis Colilert System.)

5) Colisure Test (Autoanalysis Colilert System). (The Colisure Test may be read after an incubation time of 24 hours.)

BOARD NOTE: USEPA included the P-A Coliform and Colisure Tests for testing finished water under the coliform rule, but did not include them for the purposes of the surface water treatment rule, under Section 611.531, for which quantitation of total coliforms is necessary. For these reasons, USEPA included Standard Methods~~,~~ Method 9221 C for the surface water treatment rule, but did not include it for the purposes of the total coliform rule, under this Section.

6) E*Colite® Test (Charm Sciences, Inc.).

7) m-ColiBlue24® Test (Hatch Company).

8) Readycult® 2000~~Readycult Coliforms 100 Presence/Absence Test~~.

9) ~~Membrane Filter Technique using~~ Chromocult® Method~~Coliform Agar~~.

10) Colitag® Test.

11) Modified Colitag™ Method.

BOARD NOTE: ~~On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended note 1 to the table at corresponding 40 CFR 141.21(f)(3) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 9221 A, B, and~~

~~D (as approved in 1999) or Method 9222 A, B, and C (as approved in 1997); and 9223 B (as approved in 1997). The Board has cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods) for Methods 9221 and 9223, since the cited versions of the methods appears in that reference. USEPA later added Method 9221 A, B, and D; Method 9222 A, B, and C; Method 9223 from the 21st edition of Standard Methods~~ USEPA added Standard Methods, 21st ed., Methods 9221 A, B, and D; 9222 A, B, and C; and 9223 as ~~an~~ approved alternative methods~~method~~ in appendix A to subpart C of 40 CFR 141~~, added~~ on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Modified Colitag™ Method as an approved alternative method in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

d) This subsection corresponds with 40 CFR 141.21(f)(4), which USEPA has marked "reserved." This statement maintains structural consistency with the federal regulations.

e) Suppliers must conduct fecal coliform analysis in accordance with the following procedure:

1) When the MTF Technique or P-A Coliform Test is used to test for total coliforms, shake the lactose-positive presumptive tube or P-A vigorously and transfer the growth with a sterile 3-mm loop or sterile applicator stick into brilliant green lactose bile broth and EC medium, defined below, to determine the presence of total and fecal coliforms, respectively.

2) For approved methods that use a membrane filter, transfer the total coliform-positive culture by one of the following methods: remove the membrane containing the total coliform colonies from the substrate with sterile forceps and carefully curl and insert the membrane into a tube of EC medium; (the laboratory may first remove a small portion of selected colonies for verification); swab the entire membrane filter surface with a sterile cotton swab and transfer the inoculum to EC medium (do not leave the cotton swab in the EC medium); or inoculate individual total coliform-positive colonies into EC medium. Gently shake the inoculated tubes of EC medium to insure adequate mixing and incubate in a waterbath at 44.5 ±0.2° C for 24 ±2 hours. Gas production of any amount in the inner fermentation tube of the EC medium indicates a positive fecal coliform test.

3) EC medium is described in Standard Methods, 18th ed., 19th ed., and 20th ed.: Method 9221E.

4) Suppliers need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

f) Suppliers must conduct analysis of E. coli in accordance with one of the following analytical methods, incorporated by reference in Section 611.102:

1) EC medium supplemented with 50 µg/ℓ of MUG (final concentration). EC medium is as described in subsection (e) of this Section. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 µg/ℓ MUG is commercially available. At least 10 mℓ of EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG is as in subsection (e) of this Section for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366 nm) in the dark after incubating tube at 44.5 ±2° C for 24 ±2 hours; or

2) Nutrient agar supplemented with 100 µg/ℓ MUG (final concentration), as described in Standard Methods, 19th ed. and 20th ed.,÷ Method 9222 G. This test is used to determine if a total coliform-positive sample, as determined by the MF technique, contains E. coli. Alternatively, Standard Methods, 18th ed.,÷ Method 9221 B may be used if the membrane filter containing a total coliform-positive colony or colonies is transferred to nutrient agar, as described in Method 9221 B (paragraph 3), supplemented with 100 µg/ℓ MUG . If Method 9221 B is used, incubate the agar plate at 35° Celsius for four hours, then observe the colony or colonies under ultraviolet light (366-nm) in the dark for fluorescence. If fluorescence is visible, E. coli are present.

3) Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in Appendix D of this Part. (The Autoanalysis Colilert System is a MMO-MUG test.) If the MMO-MUG test is total coliform positive after a 24-hour incubation, test the medium for fluorescence with a 366-nm ultraviolet light (preferably with a six-watt lamp) in the dark. If fluorescence is observed, the sample is E. coli-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours incubation, incubate the culture for an additional four hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG test with hepes buffer is the only approved formulation for the detection of E. coli.

4) The Colisure Test (Autoanalysis Colilert System).

5) The membrane filter method with MI agar.

6) The E*Colite® Test.

7) The m-ColiBlue24® Test.

8) Readycult® 2000~~Readycult Coliforms 100 Presence/Absence Test~~.

9) ~~Membrane Filter Technique using~~ Chromocult® Method~~Coliform Agar~~.

10) Colitag® Test.

11) ONPG-MUG Test: Standard Methods, 20th or 21st ed., Method 9223 B.

12) Modified Colitag™ Method.

BOARD NOTE: USEPA added Standard Methods, 20th or 21st ed., Method 9223 B and Standard Methods Online, Method 9223 B-97 as approved alternative methods for E. coli in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

g) As an option to the method set forth in subsection (f)(3) of this Section, a supplier with a total coliform-positive, MUG-negative, MMO-MUG test may further analyze the culture for the presence of E. coli by transferring a 0.1 mℓ, 28-hour MMO-MUG culture to EC medium + MUG with a pipet. The formulation and incubation conditions of the EC medium + MUG, and observation of the results, are described in subsection (f)(1) of this Section.

h) This subsection corresponds with 40 CFR 141.21(f)(8), a central listing of all documents incorporated by reference into the federal microbiological analytical methods. The corresponding Illinois incorporations by reference are located at Section 611.102. This statement maintains structural parity with USEPA regulations.

BOARD NOTE: Derived from 40 CFR 141.21(f) ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

Section 611.531 Analytical Requirements

The analytical methods specified in this Section, or alternative methods approved by the Agency pursuant to Section 611.480, must be used to demonstrate compliance with the requirements of

only 611.Subpart B; they do not apply to analyses performed for the purposes of Sections 611.521 through 611.527 of this Subpart L. 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 laboratory certified by the Agency to do such analysis. The following procedures must be performed by the following methods, incorporated by reference in Section 611.102:

a) A supplier must conduct analyses~~shall do~~ as follows:

1) The supplier must conduct~~Conduct~~ analyses for~~of~~ pH in accordance with one of the methods listed at Section 611.611; and

2) The supplier must conduct~~Conduct~~ analyses for~~of~~ 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 Sections 611.521 and 611.532 and Subpart B of this Part 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: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 9221 A, B, and C.

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 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 10 percent of all total coliform-positive confirmed tubes.

ii) Total coliform membrane filter technique: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 9222 A, B,

and C.

iii) ONPG-MUG test (also known as the Autoanalysis Colilert System): Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 9223.

BOARD NOTE: USEPA included the P-A Coliform and Colisure Tests for testing finished water under the coliform rule, under Section 611.526, but did not include them for the purposes of the surface water treatment rule, under this Section, for which quantitation of total coliforms is necessary. For these reasons, USEPA included Standard Methods,÷ Method 9221 C for the surface water treatment rule, but did not include it for the purposes of the total coliform rule, under Section 611.526.

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 for total coliform in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

B) Fecal Coliforms.

BOARD NOTE: The time from sample collection to initiation of analysis for source (raw) water samples required by Sections 611.521 and 611.532 and Subpart B of this Part 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: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 9221 E.

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: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 9222 D.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 9221 E and 9222 D as approved alternative methods for fecal coliforms in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

C) Heterotrophic bacteria.

i) Pour plate method: Standard Methods, 18th, 19th, 20th, or 21st ed., Method 9215 B.

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 method.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 9215 B as an approved alternative method for heterotrophic bacteria in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

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: Standard Methods, 18th, 19th, 20th, or 21st ed., Method 2130 B.

ii) Nephelometric method: USEPA Environmental Inorganic Methods, Method 180.1 (rev.2.0).

iii) GLI Method 2.

iv) Hach FilterTrak Method 10133.

v) Laser nephelometry (on-line): Mitchell Method M5271.

vi) LED nephelometry (on-line): Mitchell Method M5331 or AMI Turbiwell Method.

vii) LED nephelometry (portable): Orion Method AQ4500.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 9130 B as an approved alternative method for turbidity in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73

Fed. Reg. 31616). USEPA added Mitchell Method M5271 and Orion Method AQ4500 as approved alternative methods for turbidity in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 74 Fed. Reg. 38348). USEPA added AMI Turbiwell Method as an approved alternative method for turbidity in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

E) Temperature: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 2550.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for total coliforms, fecal coliforms, heterotrophic bacteria, turbidity, and temperature at corresponding 40 CFR 141.74(a)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 2130 B (as approved in 2001); Method 9215 B (as approved in 2000); Method 9221 A, B, and C (as approved in 1999); Method 9222 A, B, C, and D (as approved in 1997); and Method 9223 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 2130, Method 9215, Method 9221, Method 9222, and Method 9223 that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 2130 B; Method 9215 B; Method 9221 A, B, C, and E; Method 9222 A, B, C, and D; and Method 9223 from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

b) A supplier must measure residual disinfectant concentrations with one of the following analytical methods:

1) Free chlorine.

A) Amperometric Titration.

i) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 4500-Cl D.

ii) ASTM Method D1253-03 or D1253-08~~D 1253-03~~.

B) DPD Ferrous Titrimetric: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 4500-Cl F.

C) DPD Colimetric: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~

Method 4500-Cl G.

D) Syringaldazine (FACTS): Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl H.

E) On-line chlorine analyzer: USEPA OGWDW Methods, Method 334.0.

F) Amperometric sensor: Palintest ChloroSense.

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 for free chlorine in appendix A to subpart C of 40 CFR 141 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 for free chlorine in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

2) Total chlorine.

A) Amperometric Titration:÷

i) Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl D.

ii) ASTM Method D1253-03 or D1253-08~~D 1253-03~~.

B) Amperometric Titration (low level measurement): Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl E.

C) DPD Ferrous Titrimetric: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl F.

D) DPD Colimetric: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl G.

E) Iodometric Electrode: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-Cl I.

F) On-line chlorine analyzer: USEPA OGWDW Methods, Method 334.0.

G) Amperometric sensor: Palintest ChloroSense.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4500-Cl D, E, F, G, and I as approved alternative methods for total chlorine in appendix A to subpart C of 40 CFR 141 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 for total chlorine in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

3) Chlorine dioxide.

A) Amperometric Titration: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-ClO_2 C or E.

B) DPD Method: Standard Methods, 18th, 19th or 20th ed.,÷ Method 4500-ClO_2 D.

C) Spectrophotometric: USEPA OGWDW Methods, Method 327.0 (rev. 1.1).

4) Ozone: Indigo Method: Standard Methods, 18th, 19th, 20th, or 21st ed.,÷ Method 4500-O_3 B.

5) Alternative test methods: The Agency may grant a SEP pursuant to Section 611.110 that allows a supplier to use alternative chlorine test methods as follows:

A) DPD colorimetric test kits: Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits.

B) Continuous monitoring for free and 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: USEPA added Standard Methods, 21st ed., Method 4500-ClO_2 C, D, and E and Method 4500-O_3 B as approved alternative methods for chlorine dioxide in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for free chlorine, total chlorine, chlorine dioxide, and ozone at corresponding 40 CFR 141.74(a)(2) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-Cl D, E, F, G, and H (as approved in 2000); Method 4500-ClO_2 C and E (as approved in 2000); and Method 4500-O_3 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 4500-Cl, Method 4500-ClO_2, and Method 4500-O_3 that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 4500-Cl D, E, F, G, and H; Method 4500-ClO_2 C and E; and Method 4500-O_3 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

BOARD NOTE: Derived from 40 CFR 141.74(a) ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART N: INORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

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 pursuant to Section 611.480. Criteria for analyzing arsenic, 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 and 200.9 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, ~~and arsenic by Standard Methods, 18th, 19th, 20th, or 21st ed., Method 3120 B~~ 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; antimony and lead by Standard Methods, 18th, 19th, or 21st ed., Method 3113 B; and lead by ASTM Method D3559-96 D or D3559-03 D unless multiple in-furnace depositions are made.

1) Alkalinity.

A) Titrimetric.

i) ASTM Method D1067-92 B or D1067-02 B; or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 2320 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for alkalinity by titrimetric alkalinity in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 2320 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 2320 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 2320 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Electrometric titration: USGS Methods: Method I-1030-85.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 2320 B as an approved alternative method for alkalinity in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

2) Antimony.

A) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~ Method 200.8 (rev. 5.3).

B) Atomic absorption, hydride technique: ASTM Method D3697-92, ~~or~~ D3697-02, or D3697-07.

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods, ~~:~~ Method 200.9 (rev.2.2).

D) Atomic absorption, furnace technique: Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for antimony by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

3) Arsenic.

BOARD NOTE: If ultrasonic nebulization is used in the determination of arsenic by Method~~Methods 200.7,~~ 200.8, ~~or Standard Methods, 18th, 19th, 20th, or 21st ed., 3120 B,~~ the arsenic must be in the pentavalent state to provide uniform signal response. ~~For methods 200.7 and 3120 B, both samples and standards must be diluted in the same mixed acid matrix concentration of nitric and hydrochloric acid with the addition of 100 µℓ of 30% hydrogen peroxide per 100 mℓ of solution.~~ For direct analysis of arsenic with Method~~method~~ 200.8 using ultrasonic nebulization, samples and standards must contain one mg/ℓ of sodium hypochlorite.

~~A)~~ ~~Inductively coupled plasma.~~

~~BOARD NOTE: Effective January 23, 2006, a supplier may no longer employ analytical methods using the ICP-AES technology because the detection limits for these methods are 0.008 mg/ℓ or higher. This restriction means that the two ICP-AES methods (USEPA Environmental Metals Method 200.7 and Standard Methods, Method 3120 B) approved for use for the MCL of 0.05 mg/ℓ may not be used for compliance determinations for the revised MCL of 0.010 mg/ℓ. However, prior to the 2005 through 2007 compliance period, a supplier may have compliance samples analyzed with these less sensitive methods.~~

~~i)~~ ~~USEPA Environmental Metals Methods: Method 200.7; or~~

~~ii)~~ ~~Standard Methods, 18th, 19th, 20th, or 21st ed.: Method 3120 B.~~

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for arsenic by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method for several other metals in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA, however, did not specifically add Method 2130 B as to arsenic in the June 3, 2008 action.~~

A)~~B)~~ Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~: Method 200.8 (rev. 5.3).

B)~~C)~~ Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~,~~: Method 200.9 (rev. 2.2).

C)~~D)~~ Atomic absorption, furnace technique.

i) ASTM Method D2972-97 C, D2972-03 C, or D2972-08 C ~~or 2972-03 C~~; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for arsenic by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D)~~E)~~ Atomic absorption, hydride technique.

i) ASTM Method D2972-97 B, D2972-03 C, or D2972-08 B ~~or 2972-03 B~~; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3114 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for antimony by atomic absorption, hydride technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3114 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3114 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3114 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E)~~F)~~ Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods for arsenic in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D2972-08 B and C as approved alternative methods for arsenic in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908.

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

4) Asbestos: Transmission electron microscopy: USEPA Asbestos Method~~Methods~~-100.1 or~~and~~ USEPA Asbestos Method~~Methods~~-100.2.

5) Barium.

A) Inductively coupled plasma.

i) USEPA Environmental Metals Methods~~,~~: Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~: Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for barium by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~: Method 200.8 (rev. 5.3).

C) Atomic absorption, direct aspiration technique: Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3111 D.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for barium by atomic absorption, direct aspiration technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 D (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Atomic absorption, furnace technique: Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for barium by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111 D, 3113 B, and 3120 B and USEPA NERL Method 200.5 as

approved alternative methods for barium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

6) Beryllium.

A) Inductively coupled plasma.

i) USEPA Environmental Metals Methods~~,~~: Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~: Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for beryllium by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~: Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~,~~: Method 200.9 (rev. 2.2).

D) Atomic absorption, furnace technique.

i) ASTM Method D3645-97 B or D3645-03 B; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for beryllium by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods for beryllium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3645-08 B as an approved alternative method for beryllium in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

7) Cadmium.

A) Inductively coupled plasma arc furnace: USEPA Environmental Metals Methods~~:~~ Method 200.7 (rev. 4.4).

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~:~~ Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~:~~ Method 200.9 (rev. 2.2).

D) Atomic absorption, furnace technique: Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for cadmium by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods for cadmium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

8) Calcium.

A) EDTA titrimetric.

i) ASTM Method D511-93 A~~,~~ ~~or~~ D511-03 A, or D511-09 A; or

ii) Standard Methods, 18th or 19th ed.~~,~~: Method 3500-Ca D or Standard Methods, 20th or 21st ed.~~,~~: Method 3500-Ca B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for calcium by EDTA titrimetric in the table at corresponding 40 CFR~~

~~141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3500-Ca D (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3500-Ca that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3500-Ca B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Atomic absorption, direct aspiration.

i) ASTM Method D511-93 B, ~~or~~ D511-03 B, or D511-09 B; or

ii) Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3111 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for calcium by atomic absorption, direct aspiration, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Inductively coupled plasma.

i) USEPA Environmental Metals Methods, ~~:~~ Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for calcium by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Ion chromatography: ASTM Method D6919-03.

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111 B, 3120 B, and 3500-Ca B and USEPA NERL Method 200.5 as approved alternative methods for calcium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D511-09 A and B as approved alternative methods for calcium in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

9) Chromium.

A) Inductively coupled plasma.

i) USEPA Environmental Metals Methods~~,~~: Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~: Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for chromium by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~: Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~,~~: Method 200.9 (rev. 2.2).

D) Atomic absorption, furnace technique: Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for chromium by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods for chromium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

10) Copper.

A) Atomic absorption, furnace technique.

i) ASTM Method D1688-95 C~~,~~ ~~or~~ D1688-02 C, or D1688-07 C; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for copper by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Atomic absorption, direct aspiration.

i) ASTM Method D1688-95 A~~,~~ ~~or~~ D1688-02 A, or D1688-07 A; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~,~~: Method 3111 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for copper by atomic absorption, direct aspiration, in the table at corresponding~~

~~40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Inductively coupled plasma.

i) USEPA Environmental Metals Methods~~,~~ Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for copper by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~,~~ Method 200.8 (rev. 5.3).

E) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~,~~ Method 200.9 (rev. 2.2).

F) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES)~~,~~ USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111 B, 3113 B, and 3120 B and USEPA NERL Method 200.5 as an approved alternative method for copper in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D1688-07 A and C as approved alternative methods for copper in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

11) Conductivity; Conductance.

A) ASTM Method D1125-95(1999) A; or

B) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 2510 B.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 2510 B as an approved alternative method for conductivity in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for conductivity by conductance in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 2510 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 2510 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 2510 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

12) Cyanide.

A) Manual distillation (ASTM Method D2036-98 A or Standard Methods, 18th, 19th, or 20th ed.~~,~~ Method 4500-CN^- C), followed by spectrophotometric, amenable.

i) ASTM Method D2036-98 B or 2036-06 B; or

~~BOARD NOTE: USEPA added ASTM Method 2036-06 A as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 4500-CN^- G.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for cyanide by spectrophotometric, amenable, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-CN^- G (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-CN^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-CN^- G from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Manual distillation (ASTM Method D2036-98 A or Standard Methods, 18th, 19th, or 20th ed.~~,~~ Method 4500-CN^- C), followed by spectrophotometric, manual.

i) ASTM Method D2036-98 A or D2036-06 A~~2036-06 A~~;

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 4500-CN^- E; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for cyanide by spectrophotometric, manual, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-CN^-~~

~~E (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-CN⁻ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-CN⁻ E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

iii) USGS Methods~~,~~ ~~:~~ Method I-3300-85.

C) Spectrophotometric, semiautomated: USEPA Environmental Inorganic Methods~~,~~ ~~:~~ Method 335.4 (rev. 1.0).

D) Selective electrode: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ ~~:~~ Method 4500-CN⁻ F.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for cyanide by selective electrode in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-CN⁻ F (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-CN⁻ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-CN⁻ F from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) UV/Distillation/Spectrophotometric: Kelada 01.

F) Microdistillation/Flow Injection/Spectrophotometric: QuickChem 10-204-00-1-X.

G) Ligand exchange and amperometry.

i) ASTM Method D6888-03.

ii) OI Analytical Method OIA-1677 DW.

H) Gas chromatography-mass spectrometry headspace: Method ME355.01.

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 for cyanide in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Method ME355.01 as an approved alternative method for cyanide in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 74 Fed. Reg. 38348).

13) Fluoride.

A) Ion Chromatography.

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 or D4327-03; or

iii) Standard Methods, 18th, 19th, 20th, or 21st ed., Method 4110 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride by ion chromatography in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4110 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4110 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4110 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Manual distillation, colorimetric SPADNS: Standard Methods, 18th, 19th, 20th, or 21st ed., Method 4500-F^- B and D.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride by manual distillation,~~

~~colorimetry SPADNS, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-F⁻ B and D (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-F⁻ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-F⁻ B and D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Manual electrode.

i) ASTM Method D1179-93 B, D1179-99 B, or D1179-04 B; or

~~BOARD NOTE: USEPA added ASTM Method D1179-04 B as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ Method 4500-F⁻ C.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride by manual electrode in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-F⁻ C (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-F⁻ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-F⁻ C from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Automated electrode: Technicon Methods~~,~~ Method 380-75WE.

E) Automated alizarin.

i) Standard Methods, 18th, 19th, 20th, or 21st ed.,~~:~~ Method 4500-F⁻ E; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for fluoride by automated alizarin in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-F⁻ E (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-F⁻ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-F⁻ E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) Technicon Methods,~~:~~ Method 129-71W.

F) Capillary ion electrophoresis: ASTM Method D6508-00(2005).

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B and 4500⁻ B, C, D, and E and ASTM Method D1179-04 B as approved alternative methods for fluoride in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~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).~~

14) Lead.

A) Atomic absorption, furnace technique.

i) ASTM Method D3559-96 D, ~~or~~ D3559-03 D, or D3559-08; or

ii) Standard Methods, 18th, 19th, or 21st ed.~~:~~ Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for lead by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods~~:~~ Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods~~:~~ Method 200.9 (rev. 2.2).

D) Differential Pulse Anodic Stripping Voltammetry: Palintest Method 1001.

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods for lead in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3559-08 D as an approved alternative method for lead in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

15) Magnesium.

A) Atomic absorption.

i) ASTM Method D511-93 B, ~~or~~ D511-03 B, or D511-09 B; or

ii) Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3111 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for magnesium by atomic absorption in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma.

i) USEPA Environmental Metals Methods, ~~:~~ Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for magnesium by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative~~

~~method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Complexation titrimetric.

i) ASTM Method D511-93 A, ~~or~~ D511-03 A, or D511-09 A; or

ii) Standard Methods, 18th or 19th ed., ~~:~~ Method 3500-Mg E or Standard Methods, 20th or 21st ed., ~~:~~ Method 3500-Mg B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for magnesium by complexation titrimetric in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3500-Mg B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3500-Mg that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3500-Mg B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Ion chromatography: ASTM Method D6919-03.

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3111 B, 3120 B, and 3500-Mg B and USEPA NERL Method 200.5 as approved alternative methods for magnesium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D511-09 A and B as approved alternative methods for magnesium in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

16) Mercury.

A) Manual cold vapor technique.

i) USEPA Environmental Metals Methods, ~~:~~ Method 245.1 (rev. 3.0);

ii) ASTM Method D3223-97 or D3223-02; or

iii) Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3112 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for mercury by manual cold vapor technique in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3112 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3112 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3112 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Automated cold vapor technique: USEPA Inorganic Methods, ~~:~~ Method 245.2.

C) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods, ~~:~~ Method 200.8 (rev. 5.3).

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3112 B as an approved alternative method for mercury in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

17) Nickel.

A) Inductively coupled plasma.

i) USEPA Environmental Metals Methods, ~~:~~ Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.,~~:~~ Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nickel by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods,~~:~~ Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods,~~:~~ Method 200.9 (rev. 2.2).

D) Atomic absorption, direct aspiration technique: Standard Methods, 18th, 19th, or 21st ed.,~~:~~ Method 3111 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nickel by atomic absorption, direct aspiration technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Atomic absorption, furnace technique: Standard Methods, 18th, 19th, or 21st ed.~~:~~ Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nickel by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

F) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

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 for nickel in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

18) Nitrate.

A) Ion chromatography.

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 or D4327-03;

iii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~:~~ Method 4110 B; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrate by ion chromatography in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4110 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4110 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4110 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

iv) Waters Test Method B-1011, available from Millipore Corporation.

B) Automated cadmium reduction.

i) USEPA Environmental Inorganic Methods, ~~:~~ Method 353.2 (rev. 2.0);

ii) ASTM Method D3867-90 A; or

iii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 4500-NO_3^- F.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrate by automated cadmium reduction in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_3^- F (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_3^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_3^- F from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Ion selective electrode.

i) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ ~~:~~ Method 4500-NO_3^- D; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrate by ion selective electrode in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_3^- D (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_3^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_3^- D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

ii) Technical Bulletin 601.

D) Manual cadmium reduction.

i) ASTM Method D3867-90 B; or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ ~~:~~ Method 4500-NO_3^- E.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrate by manual cadmium reduction in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_3^- E (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_3^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_3^- E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Capillary ion electrophoresis: ASTM Method D6508-00(2005).

BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrate 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).

F) Reduction-colorimetric: Systea Easy (1-Reagent).

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B and 4500-NO_3^- D, E, and F as approved alternative methods for nitrate in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Systea Easy (1-Reagent) as an approved alternative method for nitrate in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 73 Fed. Reg. 38348).

19) Nitrite.

A) Ion chromatography.

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 or D4327-03;

iii) Standard Methods, 18th, 19th, 20th, or 21st ed., Method 4110 B; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrite by ion chromatography in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4110 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4110 that appears in that printed volume is that cited by USEPA as acceptable for~~

~~use. USEPA later added Method 4110 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

iv) Waters Test Method B-1011, available from Millipore Corporation.

B) Automated cadmium reduction.

i) USEPA Environmental Inorganic Methods, ~~:~~ Method 353.2 (rev. 2.0);

ii) ASTM Method D3867-90 A; or

iii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 4500-NO_3^- F.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrite by automated cadmium reduction in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_3^- F (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_3^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_3^- F from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Manual cadmium reduction.

i) ASTM Method D3867-90 B; or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 4500-NO_3^- E.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrite by manual cadmium reduction in the table at corresponding 40 CFR~~

~~141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_3^- E (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_3^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_3^- E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Spectrophotometric: Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ ~~÷~~ Method 4500-NO_2^- B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrite by spectrophotometric in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-NO_2^- B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-NO_2^- that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-NO_2^- B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Capillary ion electrophoresis: ASTM Method D6508-00(2005).

BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for nitrite 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).

F) Reduction-colorimetric: Systea Easy (1-Reagent).

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 for nitrite in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Systea Easy (1-Reagent) as an approved alternative method for nitrite in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 73 Fed. Reg. 38348).

20) Orthophosphate (unfiltered, without digestion or hydrolysis).

A) Automated colorimetric, ascorbic acid.

i) USEPA Environmental Inorganic Methods, ~~:~~ Method 365.1 (rev. 2.0); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 4500-P F.

~~BOARD NOTE: USEPA added Method 4500-P F from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA also added Method 4500-P F (as approved in 1999) as available from Standard Methods Online (at www.standardmethods.org). The Board has instead cited only to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-P F that appears in the printed volume is the 1999 version available from the online source.~~

B) Single reagent colorimetric, ascorbic acid.

i) ASTM Method D515-88 A; or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 4500-P E.

~~BOARD NOTE: USEPA added Method 4500-P E from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA also added Method 4500-P E (as approved in 1999) as available from Standard Methods Online (at www.standardmethods.org). The Board has instead cited only to the 21st edition of Standard Methods for the~~

~~Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-P E that appears in the printed volume is the 1999 version available from the online source.~~

C) Colorimetric, phosphomolybdate: USGS Methods~~,~~ ~~Method~~ I-1601-85.

D) Colorimetric, phosphomolybdate, automated-segmented flow: USGS Methods~~,~~ ~~Method~~ I-2601-90.

E) Colorimetric, phosphomolybdate, automated discrete: USGS Methods~~,~~ ~~Method~~ I-2598-85.

F) Ion Chromatography.

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 or D4327-03; or

iii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~,~~ ~~Method~~ 4110 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for orthophosphate by ion chromatography in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4110 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4110 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4110 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

G) Capillary ion electrophoresis: ASTM Method D6508-00(2005).

BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for orthophosphate 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).

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 4110 B, 4500-P E and F as approved alternative methods for orthophosphate in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

21) pH: electrometric.

A) USEPA Inorganic Methods, Method 150.1 or Method 150.2;

B) ASTM Method D1293-95 or D1293-99; or

C) Standard Methods, 18th, 19th, 20th, or 21st ed., Method 4500-H^+ B.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 4500-H^+ B as an approved alternative method for pH in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for pH by electrometric in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-H^+ B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-H^+ that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-H^+ B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

22) Selenium.

A) Atomic absorption, hydride.

i) ASTM Method D3859-98 A, ~~or~~ D3859-03 A, or D3859-08 A; or

ii) Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3114 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for selenium by atomic absorption, hydride, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3114 B (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3114 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3114 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods, ~~:~~ Method 200.8 (rev. 5.3).

C) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods, ~~:~~ Method 200.9 (rev. 2.2).

D) Atomic absorption, furnace technique.

i) ASTM Method D3859-98 B, ~~or~~ D3859-03 B, or D3859-08 B; or

ii) Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3113 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for selenium by atomic absorption, furnace technique, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3113 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3113 that appears in that printed volume is that cited by USEPA as acceptable for~~

~~use. USEPA later added Method 3113 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 3113 B and 3114 B and USEPA NERL Method 200.5 as approved alternative methods for selenium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3859-08 A and B as approved alternative methods for selenium in appendix A to subpart C of 40 CFR 141 on November 10, 2009 (at 74 Fed. Reg. 57908).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

23) Silica.

A) Colorimetric, molybdate blue: USGS Methods~~,~~ Method I-1700-85.

B) Colorimetric, molybdate blue, automated-segmented flow: USGS Methods~~,~~ Method I-2700-85.

C) Colorimetric: ASTM Method D859-94, D859-00, or D859-05.

~~BOARD NOTE: USEPA added ASTM Method D859-05 as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) Molybdosilicate: Standard Methods, 18th or 19th ed.~~,~~ Method 4500-Si D or Standard Methods, 20th or 21st ed.~~,~~ Method 4500-SiO_2 C.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for silica by molybdosilicate in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method~~

~~4500-SiO_2-C (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-SiO_2 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-SiO_2-C from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

E) Heteropoly blue: Standard Methods, 18th or 19th ed.~~,~~ ~~Method~~ 4500-Si E or Standard Methods, 20th or 21st ed.~~,~~ ~~Method~~ 4500-SiO_2 D.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for silica by heteropoly blue in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-SiO_2-D (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-SiO_2 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-SiO_2-D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

F) Automated method for molybdate-reactive silica: Standard Methods, 18th or 19th ed.~~,~~ ~~Method~~ 4500-Si F or Standard Methods, 20th or 21st ed.~~,~~ ~~Method~~ 4500-SiO_2 E.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for silica by automated method for molybdate-reactive silica in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 4500-SiO_2-E (as approved in 1997). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 4500-SiO_2 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 4500-SiO_2-E from the 21st edition of Standard Methods as an approved~~

~~alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

G) Inductively coupled plasma.

i) USEPA Environmental Metals Methods~~:~~ Method 200.7 (rev. 4.4); or

ii) Standard Methods, 18th, 19th, 20th, or 21st ed.~~:~~ Method 3120 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for silica by inductively coupled plasma in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3120 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3120 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

H) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

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 for silica in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

24) Sodium.

A) Inductively coupled plasma: USEPA Environmental Metals Methods, ~~:~~ Method 200.7 (rev. 4.4).

B) Atomic absorption, direct aspiration: Standard Methods, 18th, 19th, or 21st ed., ~~:~~ Method 3111 B.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for sodium by atomic absorption, direct aspiration, in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 3111 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 3111 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) Ion chromatography: ASTM Method D6919-03.

D) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 3113 B and USEPA NERL Method 200.5 as approved alternative methods for sodium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

25) Temperature; thermometric: Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 2550.

BOARD NOTE: ~~On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for temperature by thermometric in the table at corresponding 40 CFR 141.23(k)(1) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 2550 (as approved in 2000). The Board has instead cited to the 21st edition of Standard~~

~~Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 2550 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 2550 from the 21st edition of Standard Methods~~ USEPA added Standard Methods, 21st ed., Method 2550 as an approved alternative method for temperature in appendix A to subpart C, ~~added~~ on June 3, 2008 (at 73 Fed. Reg. 31616).

26) Thallium.

A) Inductively coupled plasma-mass spectrometry: USEPA Environmental Metals Methods, ~~:~~ Method 200.8 (rev. 5.3).

B) Atomic absorption, platform furnace technique: USEPA Environmental Metals Methods, ~~:~~ Method 200.9 (rev. 2.2).

b) Sample collection for antimony, arsenic (effective January 22, 2004), asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium 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, 200.8, or 200.9 are followed.

1) Antimony.

A) Preservative: Concentrated nitric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding 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: 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: 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: 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: 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: 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: 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: 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: 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: 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: Samples must be analyzed as soon after collection as possible, but in any event within six months.

12) Nitrate, chlorinated.

A) Preservative: Cool to 4° C.

B) Plastic or glass (hard or soft).

C) Holding time: Samples must be analyzed as soon after collection as possible, but in any event within 14 days.

13) Nitrate, non-chlorinated.

A) Preservative: Concentrated sulfuric acid to pH less than 2.

B) Plastic or glass (hard or soft).

C) Holding 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: 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: 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: 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 laboratories that received approval from USEPA or the Agency. The Agency must certify laboratories to conduct analyses for antimony, arsenic (effective January 23, 2006), 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 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) ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 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) of this Section 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 pursuant to subsection (b) of this Section, 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 pursuant to Subpart V of this Part. Monitoring after public notification must be at a frequency designated by the Agency by a SEP granted pursuant to Section 611.110 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 granted pursuant to Section 611.110.

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) Except for arsenic, for which analyses must be made in accordance with Section 611.611, 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 pursuant to Section 611.480.

1) Fluoride: The methods specified in Section 611.611(c) must apply for the purposes of this Section.

2) Iron.

A) Standard Methods.

i) Method 3111 B, 18th, 19th, or 21st ed.;

ii) Method 3113 B, 18th, 19th, or 21st ed.;

iii) Method 3120 B, 18th, 19th, 20th, or 21st ed.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for iron in the table at 40 CFR 143.4(b) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B, Method 3113 B, and Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 3111, Method 3113, and Method 3120 that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 3111 B, Method 3113 B, and Method 3120 B from the 21st edition of~~

~~Standard Methods as approved alternative methods in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) USEPA Environmental Metals Methods.

i) Method 200.7 (rev. 4.4); or

ii) Method 200.9 (rev. 2.2).

C) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141~~,~~ ~~added~~ on June 3, 2008 (at 73 Fed. Reg. 31616).

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 for iron in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

3) Manganese.

A) Standard Methods.

i) Method 3111 B, 18th, 19th, or 21st ed.;

ii) Method 3113 B, 18th, 19th, or 21st ed.; or

iii) Method 3120 B, 18th, 19th, 20th, or 21st ed.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for manganese in the table at 40 CFR 143.4(b) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B, Method 3113 B, and Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 3111, Method 3113, and Method 3120 that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 3111~~

~~B, Method 3113 B, and Method 3120 B from the 21st edition of Standard Methods as approved alternative methods in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) USEPA Environmental Metals Methods.

i) Method 200.7 (rev. 4.4);

ii) Method 200.8 (rev. 5.3); or

iii) Method 200.9 (rev. 2.2).

C) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

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 for manganese in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

4) Zinc.

A) Standard Methods.

i) Method 3111 B, 18th, 19th, or 21st ed.; or

ii) Method 3120 B, 18th , 19th, 20th, or 21st ed.

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for zinc in the table at 40 CFR 143.4(b) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 3111 B and Method 3120 B (as approved in 1999). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 3111 and Method 3120 that appear in that printed volume are those cited by USEPA as acceptable for use.~~

~~USEPA later added Method 3111 B, Method 3113 B, and Method 3120 B from the 21st edition of Standard Methods as approved alternative methods in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) USEPA Environmental Metals Methods.

i) Method 200.7 (rev. 4.4); or

ii) Method 200.8 (rev. 5.3).

C) Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES): USEPA NERL~~Methods:~~ Method 200.5.

BOARD NOTE: USEPA added Standard Methods, 21st ed.; Methods 3111 B and 3120 B and USEPA NERL Method 200.5 as approved alternative methods for zinc in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

BOARD NOTE: The provisions of subsections (a) through (e)~~(f)~~ of this Section derive from 40 CFR 141.23(l) through (p) (2009)~~(2007)~~. Subsections (f)(2) through (f)(4) of this Section relate exclusively to additional State requirements. The Board retained subsection (f) of this Section 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) ~~(2007)~~ and appendix A to subpart C of 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~, for secondary MCLs.

(Source: Amended at 35 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 THMs, TTHMs, and TTHM potential must be conducted using the methods listed in this Section ~~or by alternative methods as approved by the Agency pursuant to Section 611.480~~. All methods are from USEPA Organic Methods, unless otherwise indicated. 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 document, "Technical Notes of Drinking Water Methods," incorporated by reference in Section 611.102.

Volatile Organic Chemical Contaminants (VOCs).

Contaminant	Analytical Methods
Benzene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
Carbon tetrachloride	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0), 551.1 (rev. 1.0)
Chlorobenzene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
1,2-Dichlorobenzene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
1,4-Dichlorobenzene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
1,2-Dichloroethane	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
cis-Dichloroethylene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
trans-Dichloroethylene	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
Dichloromethane	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,

1,2-Dichloropropane	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
Ethylbenzene	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
Styrene	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
Tetrachloroethylene	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
1,1,1-Trichloroethane	Method 524.3 (rev. 1.0), 551.1 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
Trichloroethylene	Method 524.3 (rev. 1.0), 551.1 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
Toluene	Method 524.3 (rev. 1.0), 551.1 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
1,2,4-Trichlorobenzene	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
1,1-Dichloroethylene	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,
1,1,2-Trichloroethane	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods,

Vinyl chloride	Method 524.3 (rev. 1.0) 502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)
Xylenes (total)	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0)

BOARD NOTE: USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method for all of the VOCs in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 74 Fed. Reg. 38348).

Synthetic Organic Chemical Contaminants (SOCs).

Contaminant	Analytical Methods
2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCDD or dioxin)	Dioxin and Furan Method 1613 (rev. B)
2,4-D	515.2 (rev. 1.1), 555 (rev. 1.0), 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
2,4,5-TP (Silvex)	515.2 (rev. 1.1), 555 (rev. 1.0), 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
Alachlor	505 (rev. 2.1)[1], 507 (rev. 2.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)

Atrazine	505 (rev. 2.1)[1], 507 (rev. 2.1), 508.1 (rev. 2.1), 525.2 (rev. 2.0), 551.1 (rev. 1.0), Syngenta AG-625[2]
Benzo(a)pyrene	525.2 (rev. 2.0), 550, 550.1
Carbofuran	531.1 (rev. 3.1), USEPA OGWDW Methods, Method 531.2 (rev. 1.0), Standard Methods, 18th ed. Supplement, 19th ed., or 20th ed.,÷ Method 6610 or Standard Methods 21st ed. or Standard Methods Online,÷ Method 6610 B-04
Chlordane	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.1), 525.2 (rev. 2.0)
Dalapon	515.1 (rev. 4.0), 552.1 (rev. 1.0), 552.2 (rev. 1.0), USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0), USEPA OGWDW Methods, Methods~~Method~~ 515.4 (rev. 1.0), ~~OGWDW Methods, Method~~ 552.3 (rev. 1.0), and 557; and Standard Methods, 21st ed., Method 6640 B
Di(2-ethylhexyl)adipate	506 (rev. 1.1), 525.2 (rev. 2.0)
Di(2-ethylhexyl)phthalate	506 (rev. 1.1), 525.2 (rev. 2.0)
Dibromochloropropane (DBCP)	504.1 (rev. 1.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0), 551.1 (rev. 1.0)

Dinoseb	515.1 (rev. 4.0), 515.2 (rev. 1.1), USEPA Organic and Inorganic Methods, Method 515.3 (rev. 1.0), USEPA OGWDW Methods, Method 515.4 (rev. 1.0), 555 (rev. 1.0)
Diquat	USEPA NERL Method 549.2 (rev. 1.0)~~549.1~~
Endothall	548.1 (rev. 2.0)
Endrin	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)
Ethylene dibromide~~Dibromide~~ (EDB)	504.1 (rev. 1.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0), 551.1 (rev.1.0)
Glyphosate	547, Standard Methods, 18th ed., 19th ed., or 20th ed.,~~:~~ Method 6651
Heptachlor	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)
Heptachlor Epoxide	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev.1.0)
Hexachlorobenzene	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)
Hexachlorocyclopentadiene	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)
Lindane	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)

Methoxychlor	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)
Oxamyl	531.1 (rev. 3.1);~~,~~ USEPA OGWDW Methods, Method 531.2 (rev. 1.0);~~,~~ Standard Methods, 18th ed. Supplement, 19th ed., or 20th ed.,~~:~~ Method 6610;~~ or~~ Standard Methods 21st ed., Method 6610 B; or Standard Methods Online,~~:~~ Method 6610 B-04
PCBs (measured for compliance purposes as decachlorobiphenyl~~decchlorobiphenyl~~)	508A (rev. 1.0)
PCBs (qualitatively identified as Aroclors)	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0)
Pentachlorophenol	515.1 (rev. 4.0), 515.2 (rev. 1.1), 525.2 (rev. 2.0), 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)
Picloram	515.1 (rev. 4.0), 515.2, (rev. 1.1) 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)

Simazine	505 (rev. 2.1)[1], 507 (rev. 2.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0), 551.1 (rev. 1.0)~~551.2~~
Toxaphene	505 (rev. 2.1), 508 (rev. 2.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0)~~, 508.1~~

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 6610 B and Standard Methods Online, Method 6610 B-04 as approved alternative methods for carbofuran and oxamyl on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method for dibromochloropropane and ethylene dibromide in appendix A to subpart C of 40 CFR 141 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 for dalapon in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295). Since the version of Method 6640 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.

Total Trihalomethanes (TTHMs).

Contaminant	Analytical Methods
Total Trihalomethanes (TTHMs), Trihalomethanes (THMs), and Maximum Total Trihalomethane Potential	502.2 (rev. 2.1), 524.2 (rev. 4.1), USEPA OGWDW Methods, Method 524.3 (rev. 1.0), 551.1 (rev. 1.0)

BOARD NOTE: USEPA added USEPA OGWDW Method 524.3 (rev. 1.0) as an alternative method for total trihalomethane in appendix A to subpart C of 40 CFR 141 on August 3, 2009 (at 74 Fed. Reg. 38348).

State-Only MCLs (for which a method is not listed above).

Contaminant	Analytical Methods
Aldrin	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0)
DDT	505 (rev. 2.1), 508 (rev. 3.1)

Dieldrin	505 (rev. 2.1), 508 (rev. 3.1), 508.1 (rev. 2.0), 525.2 (rev. 2.0)

[1] denotes that, for the particular contaminant, a nitrogen-phosphorus detector should be substituted for the electron capture detector in method 505 (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 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 that is greater than one-half the maximum contaminant level (MCL) (in other words, greater than 0.0015mg/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 triggers such confirmatory testing, the confirmatory result is to be used to determine compliance.

BOARD NOTE: Derived from 40 CFR 141.24(e) ~~(2007)~~ and appendix A to subpart C of 40 CFR 141 (2009), as amended~~added~~ at 74~~73~~ Fed. Reg. 38348 (August 3, 2009) and 75 Fed. Reg. 32295 (June 8, 2010)~~31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART P: THM MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.680 Sampling, Analytical, and other Requirements

a) Required monitoring.

1) A CWS supplier that serves a population of 10,000 or more individuals and which adds a disinfectant (oxidant) to the water in any part of the drinking water treatment process must analyze for TTHMs in accordance with this Subpart P.

2) For the purpose of this Subpart P, the minimum number of samples required to be taken by the supplier must be based on the number of treatment plants used by the supplier. However, the Agency shall, by a SEP issued pursuant to Section 611.110, provide that multiple wells drawing raw water from a single aquifer be considered one treatment plant for determining the minimum number of samples.

3) All samples taken within an established frequency must be collected

within a 24-hour period.

b) A CWS supplier that serves 10,000 or more individuals.

1) For a CWS supplier utilizing surface a water source in whole or in part, and for a CWS supplier utilizing only a groundwater source, except as provided in Section 611.683, analyses for TTHMs must be performed at quarterly intervals on at least four water samples for each treatment plant used by the system. At least 25 percent of the samples must be taken at locations within the distribution system reflecting the maximum residence time (MRT) of the water in the system. The remaining 75 percent must be taken at representative locations in the distribution system, taking into account the number of persons served, different sources of water and different treatment methods employed. The results of all analyses per quarter must be arithmetically averaged and reported to the Agency within 30 days after the supplier's receipt of such results. All samples collected must be used in the computation of the average, unless the analytical results are invalidated for technical reasons. Sampling and analyses must be conducted in accordance with the methods listed in Section 611.685.

2) Upon application by a CWS supplier, the Agency must, by a SEP issued pursuant to Section 611.110, reduce the monitoring frequency required by subsection (b)(1) to a minimum of one sample analyzed for TTHMs per quarter taken at a point in the distribution system reflecting the MRT of the water in the system, if the Agency determines that the data from at least one year of monitoring in accordance with subsection (b)(1) and local conditions demonstrate that TTHM concentrations will be consistently below the MCL.

3) If at any time during which the reduced monitoring frequency prescribed under this subsection (b) applies, the results from any analysis exceed 0.10 mg/ℓ TTHMs and such results are confirmed by at least one check sample taken promptly after such results are received, or if the CWS supplier makes any significant change to its source of water or treatment program, the supplier must immediately begin monitoring in accordance with the requirements of subsection (b)(1), which monitoring must continue for at least one~~1~~ year before the frequency may be reduced again. The Agency must, by a SEP issued pursuant to Section 611.110, require monitoring in excess of the minimum frequency where it is necessary to detect variations of TTHM levels within the distribution system.

BOARD NOTE: Subsections (a) and (b) of this Section are derived from 40 CFR 141.30(a) and (b) (2009)~~(2002)~~, modified to remove the limitation regarding

addition of disinfectant.

c) Surface water sources for a CWS supplier that serves fewer than 10,000 individuals. Suppliers must have submitted at least one initial sample per treatment plant for analysis or analytical results from a certified laboratory for MRT concentration taken between May 1, 1990, and October 31, 1990. After written request by the supplier and the determination by the Agency that the results of the sample indicate that the CWS supplier is not likely to exceed the MCL, the CWS must continue to submit one annual sample per treatment plant for analysis or analytical results from a certified laboratory to the Agency taken between May 1 and October 31 of succeeding years. If the sample exceeds the MCL, the CWS must submit to the Agency samples in accordance with the sampling frequency specified in subsection (b) of this Section.

BOARD NOTE: This is an additional State requirement.

d) Groundwater sources for a CWS supplier that serves fewer than 10,000 individuals. Suppliers are not required to submit samples for THM analysis under this Subpart P.

BOARD NOTE: This is an additional State requirement.

(Source: Amended at 35 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 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) Standard Methods.

i) Method 302, 13th ed.; or

ii) Method 7110 B, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for gross alpha and beta~~

~~by evaporation in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7110 B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7110 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7110 B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) USEPA Interim Radiochemical Methods: pages~~page~~ 1-3;

C) USEPA Radioactivity Methods, ~~:~~ Method 900.0;

D) USEPA Radiochemical Analyses: pages~~page~~ 1-5;

E) USEPA Radiochemistry Methods Procedures, ~~: Method~~ 00-01; or

F) USGS Methods, ~~:~~ Method R-1120-76.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7110 B as an approved alternative method for gross alpha and beta in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

2) Gross Alpha.

A) Standard Methods, 18th, 19th, 20th, or 21st ed., ~~:~~ Method 7110 C; or

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for gross alpha by coprecipitation in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7110 C (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7110 that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7110 C from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) USEPA Radiochemistry Procedures,~~Methods:~~ Method 00-02.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7110 C as an approved alternative method for gross alpha in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

3) Radium-226.

A) ASTM Methods.

i) Method D2460-97 or D2460-07; or

ii) Method D3454-97 or D3454-05;

B) New York Radium Method;

C) Standard Methods.

i) Method 304, 13th ed.;

ii) Method 305, 13th ed.;

iii) Method 7500-Ra B, 17th, 18th, 19th, 20th, or 21st ed.; or

iv) Method 7500-Ra C, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for radium-226 in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7500-Ra B and C (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7500-Ra that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7500-Ra B and C from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) EML Procedures~~USDOE~~ Manual (27th or 28th ed.),~~:~~ Method Ra-04;

E) USEPA Interim Radiochemical Methods: pages 13-15 or ~~and~~ 16-23;

F) USEPA Radioactivity Methods~~:~~, Methods 903.0, 903.1;

G) USEPA Radiochemical Analyses, pages~~: page~~ 19-32;

H) USEPA Radiochemistry Procedures, Method~~Methods: Methods~~ Ra-03 or~~,~~ Ra-04; or

I) USGS Methods.

i) Method R-1140-76; or

ii) Method R-1141-76.

J) Georgia Radium Method.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7500-Ra B and C as approved alternative methods for radium-226 in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D2460-07 and D3454-05 as approved alternative methods for radium-226 in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

4) Radium-228.

A) Standard Methods, 17th, 18th, 19th, 20th, or 21st ed.~~:~~, Method 7500-Ra D;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for radium-228 by radiochemical in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7500-Ra-D (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7500-Ra that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7500-Ra-D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) New York Radium Method;

C) USEPA Interim Radiochemical Methods, pages~~:~~ ~~page~~ 24-28;

D) USEPA Radioactivity Methods,~~:~~ Method 904.0;

E) USEPA Radiochemical Analyses, pages~~:~~ ~~page~~ 19-32;

F) USEPA Radiochemistry Procedures,~~Methods:~~ Method Ra-05;

G) USGS Methods,~~:~~ Method R-1142-76;

H) New Jersey Radium Method; or

I) Georgia Radium Method.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-Ra D as an approved alternative method for radium-228 in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

5) Uranium.

A) Standard Methods, 17th, 18th, 19th, 20th, or 21st ed.,~~:~~ Method 7500-U C;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for uranium by radiochemical and alpha spectrometry in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7500-U C (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7500-U that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7500-U B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) Standard Methods, 20th ed.,~~:~~ Method 3125;

C) ASTM Methods.

i) Method D2907-97;

ii) Method D3972-97 or D3972-02;

iii) Method D5174-97, ~~or~~ D5174-02, or D5174-07; or

iv) Method D5673-03 or Method 5673-05;

~~BOARD NOTE: USEPA added this method as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

D) USEPA Radioactivity Methods, ~~:~~ Methods 908.0, 908.1;

E) USEPA Environmental Metals Methods, ~~:~~ Method 200.8 (rev. 5.3);

F) USEPA Radiochemical Analyses, pages ~~: page~~ 33-48;

G) USEPA Radiochemistry Procedures, ~~Methods:~~ Method 00-07;

H) EML Procedures ~~USDOE~~ Manual (27^{th} or 28^{th} ed.), ~~:~~ Method U-02 or U-04; or

I) USGS Methods.

i) Method R-1180-76;

ii) Method R-1181-76; or

iii) 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, 21^{st} ed., Method 7500-U C and ASTM D5673-05 as approved alternative methods for uranium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D5174-07 as an approved alternative method for uranium in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

6) Radioactive Cesium.

A) ASTM Methods.

i) Method D2459-72; or

ii) Method D3649-91, ~~or~~ D3649-98a, or D3649-06;

B) Standard Methods.

i) Method 7120, 19th, 20th, or 21st ed.; or

ii) Method 7500-Cs B, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for radioactive cesium in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7120 (as approved in 1997) and Method 7500-Cs B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 7120 and Method 7500-Cs that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 7120 and Method 7500-Cs B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) EML Procedures ~~USDOE~~ Manual (27th or 28th ed.), ~~:~~ Method 4.5.2.3;

D) USEPA Interim Radiochemical Methods, pages ~~: page~~ 4-5;

E) USEPA Radioactivity Methods, ~~:~~ Methods 901.0, 901.1;

F) USEPA Radiochemical Analyses, pages ~~: page~~ 92-95; or

G) USGS Methods.

i) Method R-1110-76; or

ii) Method R-1111-76.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7120 and 7500-Cs B as approved alternative methods for radioactive cesium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D3649-06 as an approved alternative method for radioactive cesium in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

7) Radioactive Iodine.

A) ASTM Methods.

i) D3649-91, ~~or~~ D3649-98a, or D3649-06; or

ii) D4785-93, ~~or~~ D4785-98, or D4785-08;

B) Standard Methods.

i) Method 7120, 19th, 20th, or 21st ed.;

ii) Method 7500-I B, 17th, 18th, 19th, 20th, or 21st ed.;

iii) Method 7500-I C, 17th, 18th, 19th, 20th, or 21st ed.; or

iv) Method 7500-I D, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for radioactive iodine in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7120 (as approved in 1997) and Method 7500-I B, C, and D (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 7120 and Method 7500-I that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 7500-I B, C, and D from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) EML Procedures~~USDOE~~ Manual (27th or 28th ed.),~~:~~ Method 4.5.2.3;

D) USEPA Interim Radiochemical Methods,~~:~~ pages 6-8 or~~,~~ 9-12;

E) USEPA Radiochemical Analyses,~~:~~ pages~~page~~ 92-95; or

F) USEPA Radioactivity Methods,~~:~~ Methods 901.1 or~~,~~ 902.0.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Methods 7120 and 7500-I B, C, and D as approved alternative methods for radioactive iodine in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3649-06 and D4785-08 as approved alternative methods for radioactive iodine in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

8) Radioactive Strontium-89 & 90.

A) Standard Methods.

i) Method 303, 13th ed.; or

ii) Method 7500-Sr B, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for radioactive strontium in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7500-Sr B (as approved in 2001). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7500-Sr that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7500-Sr B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

B) EML Procedures~~USDOE~~ Manual (27th or 28th ed.), Method Sr-01 or Sr-02.

~~i) Method Sr-01; or~~

~~ii) Method Sr-02;~~

C) USEPA Interim Radiochemical Methods, pages~~:~~ ~~page~~ 29-33;

D) USEPA Radioactivity Methods,~~:~~ Method 905.0;

E) USEPA Radiochemical Analyses, pages~~:~~ ~~page~~ 65-73;

F) USEPA Radiochemistry Procedures,~~Methods:~~ Method Sr-04; or

G) USGS Methods,~~:~~ Method R-1160-76.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-Sr B as an approved alternative method for radioactive strontium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616).

9) Tritium.

A) ASTM Methods: Method D4107-91,~~ or~~ D4107-98, or D4107-08;

B) Standard Methods.

i) Method 306, 13th ed.; or

ii) Method 7500-^{3}H B, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entry for tritium in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7500-^{3}H B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 7500-^{3}H that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA later added Method 7500-^{3}H B from the 21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) USEPA Interim Radiochemical Methods, pages~~:~~ ~~page~~ 34-37;

D) USEPA Radioactivity Methods,~~:~~ Method 906.0;

E) USEPA Radiochemical Analyses, pages~~: page~~ 87-91;

F) USEPA Radiochemistry Procedures,~~Methods:~~ Method H-02; or

G) USGS Methods,~~:~~ Method R-1171-76.

BOARD NOTE: USEPA added Standard Methods, 21st ed., Method 7500-^{3}H B as an approved alternative method for tritium in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Method D4107-08 as an approved alternative method for tritium in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

10) Gamma Emitters.

A) ASTM Methods.

i) Method D3649-91, ~~or~~ D3649-98a, or D3649-06; or

ii) Method D4785-93, ~~or~~ D4785-00a, or D4785-08;

B) Standard Methods.

i) Method 7120, 19th, 20th, or 21st ed.;

ii) Method 7500-Cs B, 17th, 18th, 19th, 20th, or 21st ed.; or

iii) Method 7500-I B, 17th, 18th, 19th, 20th, or 21st ed.;

~~BOARD NOTE: On March 12, 2007 (at 72 Fed. Reg. 11200), USEPA amended the entries for gamma emitters in the table at corresponding 40 CFR 141.25(a) to allow the use of Standard Methods Online (at www.standardmethods.org), Method 7120 (as approved in 1997), Method 7500-Cs B (as approved in 2000), and Method 7500-I B (as approved in 2000). The Board has instead cited to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the versions of Method 7120, Method 7500-Cs, and Method 7500-I that appear in that printed volume are those cited by USEPA as acceptable for use. USEPA later added Method 7150, Method 7500-Cs B, and Method 7500-I B from the~~

~~21st edition of Standard Methods as an approved alternative method in appendix A to subpart C of 40 CFR 141, added on June 3, 2008 (at 73 Fed. Reg. 31616).~~

C) EML Procedures~~USDOE~~ Manual (27th or 28th ed.),~~:~~ Method Ga-01-R;

D) USEPA Radioactivity Methods,~~:~~ Methods 901.0, 901.1, or 902.0;

E) USEPA Radiochemical Analyses, pages~~: page~~ 92-95; or

F) USGS Methods,~~:~~ 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 for gamma emitters in appendix A to subpart C of 40 CFR 141 on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added ASTM Methods D3649-08 and D4785-08 as approved alternative methods for tritium in appendix A to subpart C of 40 CFR 141 on June 8, 2010 (at 75 Fed. Reg. 32295).

b) When the identification and measurement of radionuclides other than those listed in subsection (a) of this Section 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) "Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions," available from NTIS.

2) EML Procedures~~HASL Procedure~~ Manual (27th or 28th ed.), ~~HASL 300,~~ available from USDOE, EML~~ERDA Health and Safety Laboratory~~.

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	3 pCi/ℓ

activity	
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 (2009)~~(2007)~~.

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 (2009)~~(2007)~~.

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~~(2007)~~ and appendix A to subpart C of 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART S: GROUNDWATER RULE

Section 611.802 Groundwater Source Microbial Monitoring and Analytical Methods

a) Triggered source water monitoring.

1) General 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; and

B) The supplier is notified that a sample collected pursuant to Section 611.521 is total coliform-positive, and the sample is not invalidated by the Agency pursuant to Section 611.523.

2) Sampling 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 pursuant to Section 611.521, except as provided in subsection (a)(2)(B) of this Section.

A) The Agency may, by a SEP issued pursuant to Section 611.110, 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 issued pursuant to Section 611.110, 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 pursuant to Section 611.521 and that the system intends to use for representative sampling pursuant to this subsection (a).

C) 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 Section 611.522 and to satisfy the monitoring requirements of subsection (a)(2) of this Section for that groundwater source only if the Agency approves the use of E. coli as a fecal indicator for source water monitoring pursuant to this subsection (a) by a SEP issued pursuant to Section 611.110. If the repeat sample collected from the groundwater source is E.coli positive, the system must comply with subsection (a)(3) of this Section.

3) Additional requirements. If the Agency does not require corrective action pursuant to Section 611.803(a)(2) for a fecal indicator-positive source water sample collected pursuant to subsection (a)(2) of this Section that is

not invalidated pursuant to subsection (d) of this Section, 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.

A) In addition to the other requirements of this subsection (a), a consecutive GWS supplier that has a total coliform-positive sample collected pursuant to Section 611.521 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 pursuant to Section 611.521 is total coliform-positive must, within 24 hours after being notified, collect a sample from its groundwater sources pursuant to subsection (a)(2) of this Section and analyze it for a fecal indicator pursuant to subsection (c) of this Section.

ii) If the sample collected pursuant to subsection (a)(4)(B)(i) of this section 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 of being notified of the groundwater source sample monitoring result and must meet the requirements of subsection (a)(3) of this Section.

5) Exceptions to the triggered source water monitoring requirements. A GWS supplier is not required to comply with the source water monitoring requirements of subsection (a) of this Section if either of the following conditions exists:

A) The Agency determines, and documents in writing, by a SEP issued pursuant to Section 611.110, that the total coliform-positive sample collected pursuant to Section 611.521 is caused by a distribution system deficiency; or

B) The total coliform-positive sample collected pursuant to Section 611.521 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. If directed by the Agency by a SEP issued pursuant to Section 611.110, 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 pursuant to subsection (a)(2) of this Section to meet the requirements of subsection (b) of this Section. 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) of this Section 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 issued pursuant to Section 611.110 that is representative of the water quality of that well.

c) Analytical methods.

1) A GWS supplier subject to the source water monitoring requirements of subsection (a) of this Section 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 pursuant to subsection (a) of this Section using one of the analytical methods listed in subsections (c)(2)(A) through (c)(2)(C) of this Section, or alternative methods approved by the Agency pursuant to Section 611.480, subject to the limitations of subsection (c)(2)(D) of this Section, for the presence of E. coli, enterococci, or coliphage:

A) E. coli:

i) Autoanalysis Colilert System, Standard Methods, 20th or 21st ed., Method 9223 B.

ii) Colisure Test, Standard Methods, 20th or 21st ed., Method 9223 B.

iii) Membrane Filter Method with MI Agar, USEPA Method 1604.

iv) m-ColiBlue24 Test.

v) E*Colite Test.

vi) EC-MUG, Standard Methods, 20th ed., Method 9221 F.

vii) NA–MUG, Standard Methods, 20th ed., Method 9222 G.

viii) Colilert-18, Standard Methods, 20th or 21st ed., Method 9223 B~~9222 G~~.

ix) Readycult® 2007.

x) Modified Colitag™ Method.

xi) Chromomcult® Method.

BOARD NOTE: EC-MUG (Standard Methods, Method 9221F) or NA-MUG (Standard Methods, Method 9222G) can be used for E. coli testing step, as described in Section 611.526(f)(1) or (f)(2)~~611.526(a) or (b)~~ after

use of Standard Methods, Method 9221 B, 9221 D, 9222 B, or 9222 C. USEPA added Standard Methods, 21st ed., Method 9223 B as an approved alternative method for E. coli on June 3, 2008 (at 73 Fed. Reg. 31616). USEPA added Readycult® 2007, Modified Colitag™ Method, and Chromocult® Method as approved alternative methods for E. coli on June 8, 2010 (at 75 Fed. Reg. 32295). ~~On June 3, 2008 (at 73 Fed. Reg. 31616), USEPA added appendix A to subpart C of 40 CFR 141, which authorized alternative methods to those listed for E. coli by Colilert and Colisure and added Colilert-18 in the table at corresponding 40 CFR 141.402(c)(2) to allow the use of the 21st edition of Standard Methods for the Examination of Water and Wastewater and Standard Methods Online (at www.standardmethods.org), Method 9223 B (as approved in 1997). The Board has instead cited only to the 21st edition of Standard Methods for the Examination of Water and Wastewater (the printed version of Standard Methods), since the version of Method 9223 B that appears in that printed volume is that cited by USEPA as acceptable for use. USEPA also added the version of Method 9223 B that appears in the 20th edition of Standard Methods as to Colilert-18.~~

B) Enterococci:

i) Multiple-Tube Technique, Standard Methods, 20th ed., Method 9230 B or Standard Methods Online, Method 9230 B-04.

~~BOARD NOTE: On June 3, 2008 (at 73 Fed. Reg. 31616), USEPA added appendix A to subpart C of 40 CFR 141, which authorized alternative methods to those listed for enterococci by multiple-tube technique at corresponding 40 CFR 141.402(c)(2) to allow the use of the Standard Methods Online (at www.standardmethods.org), Method 9230 B (as approved in 2004).~~

ii) Membrane Filter Technique, Standard Methods, 20th ed., Method 9230 C, and USEPA Method 1600.

BOARD NOTE: The holding time and temperature for groundwater samples are specified in subsection (c)(2)(D) of this Section, rather than as specified in Section 8 of USEPA Method 1600.

iii) Enterolert.

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 for enterococci on June 3, 2008 (at 73 Fed. Reg. 31616).

C) Coliphage:

i) Two-Step Enrichment Presence-Absence Procedure, USEPA Method 1601.

ii) Single Agar Layer Procedure, USEPA Method 1602.

D) Limitation on 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 during transit.

d) Invalidation of a fecal indicator-positive groundwater source sample.

1) A GWS supplier may obtain Agency invalidation of a fecal indicator-positive groundwater source sample collected pursuant to subsection (a) of this Section 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 issued pursuant to Section 611.110 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 pursuant to subsection (a) of this Section 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) of this Section. 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.

1) Any groundwater source sample required pursuant to subsection (a) of this Section 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) of this Section if the sample is representative of the water quality of that well.

f) New sources. If directed by the Agency by a SEP issued pursuant to Section 611.110, a GWS supplier that places a new groundwater source into service after November 30, 2009 must conduct assessment source water monitoring pursuant to subsection (b) of this Section. 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 pursuant to subsection (a) or (b) of this Section that is fecal indicator-positive and which is not invalidated pursuant to subsection (d) of this Section, including a consecutive system supplier served by the groundwater source, must conduct public notification pursuant to Section 611.902.

h) Monitoring Violations. A failure to meet the requirements of subsections (a) through (f) of this Section is a monitoring violation that requires the GWS supplier to provide public notification pursuant to Section 611.904.

BOARD NOTE: Derived from 40 CFR 141.402 ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART W: INITIAL DISTRIBUTION SYSTEM EVALUATIONS

Section 611.925 Subpart Y Compliance Monitoring Location Recommendations

a) A supplier's IDSE report must include its recommendations and justification for where and during what months it will conduct TTHM and HAA5 monitoring for

Subpart Y of this Part. The supplier must base its recommendations on the criteria set forth in subsections (b) through (e) of this Section.

b) The supplier must select the number of monitoring locations specified in the applicable of subsections (b)(1) through (b)(13) of this Section, subject to the limitations of subsections (b)(14) and (b)(15) of this Section. The supplier will use these recommended locations as Subpart Y routine compliance monitoring locations, unless the Agency requires different or additional locations. The supplier should distribute locations throughout the distribution system to the extent possible.

1) A Subpart B system supplier that serves fewer than 500 persons must annually collect samples from two monitoring locations: one sample from the highest TTHM location and one sample from the highest HAA5 location.

2) A Subpart B system supplier that serves 500 to 3,300 persons must quarterly collect samples from two monitoring locations: one sample from the highest TTHM location and one sample from the highest HAA5 location.

3) A Subpart B system supplier that serves 3,301 to 9,999 persons must quarterly collect samples from two monitoring locations: one sample from the highest TTHM location and one sample from the highest HAA5 location.

4) A Subpart B system supplier that serves 10,000 to 49,999 persons must quarterly collect samples from four monitoring locations: two samples from the highest TTHM locations, one sample from the highest HAA5 location, and one sample from an existing Subpart I compliance location.

5) A Subpart B system supplier that serves 50,000 to 249,999 persons must quarterly collect samples from eight monitoring locations: three samples from the highest TTHM location, three samples from the highest HAA5 locations, and two samples from existing Subpart I compliance locations.

6) A Subpart B system supplier that serves 250,000 to 999,999 persons must quarterly collect samples from 12 monitoring locations: five samples from the highest TTHM location, four samples from the highest HAA5 locations, and three samples from existing Subpart I compliance locations.

7) A Subpart B system supplier that serves 1,000,000 to 4,999,999 persons must quarterly collect samples from 16 monitoring locations: six samples

from the highest TTHM location, six samples from the highest HAA5 locations, and four samples from existing Subpart I compliance locations.

8) A Subpart B system supplier that serves more than 5,000,000 persons must quarterly collect samples from 20 monitoring locations: eight samples from the highest TTHM location, seven samples from the highest HAA5 locations, and five samples from existing Subpart I compliance locations.

9) A groundwater system supplier that serves fewer than 500 persons must annually collect samples from two monitoring locations: one sample from the highest TTHM location and one sample from the highest HAA5 location.

10) A groundwater system supplier that serves 500 to 9,999 persons must annually collect samples from two monitoring locations: one sample from the highest TTHM location and one sample from the highest HAA5 location.

11) A groundwater system supplier that serves 10,000 to 99,999 persons must quarterly collect samples from four monitoring locations: two samples from the highest TTHM locations, one sample from the highest HAA5 location, and one sample from an existing Subpart I compliance location.

12) A groundwater system supplier that serves 100,000 to 499,999 persons must quarterly collect samples from six monitoring locations: three samples from the highest TTHM locations, two samples from the highest HAA5 locations, and one sample from an existing Subpart I compliance location.

13) A groundwater system supplier that serves more than 500,000 persons must quarterly collect samples from eight monitoring locations: three samples from the highest TTHM locations, three samples from the highest HAA5 locations, and two samples from existing Subpart I compliance locations.

14) The supplier must monitor during the month of highest DBP concentrations.

15) 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 persons. 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~~A~~ supplier that is on annual monitoring or which is~~and~~ a Subpart B system supplier that serves 500 to 3,300 persons 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 ~~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~~, if monitored annually~~.

c) The supplier must recommend Subpart Y compliance monitoring locations based on standard monitoring results, system-specific study results, and Subpart I compliance monitoring results. The supplier must follow the protocol in subsections (c)(1) through (c)(8) of this Section. If required to monitor at more than eight locations, the supplier must repeat the protocol as necessary. If the supplier does not have existing Subpart I compliance monitoring results or if the supplier does not have enough existing Subpart I compliance monitoring results, the supplier must repeat the protocol, skipping the provisions of subsections (c)(3) and (c)(7) of this Section as necessary, until the supplier has identified the required total number of monitoring locations.

1) The location with the highest TTHM LRAA not previously selected as a Subpart Y monitoring location.

2) The location with the highest HAA5 LRAA not previously selected as a Subpart Y monitoring location.

3) The existing Subpart I average residence time compliance monitoring location (maximum residence time compliance monitoring location for a groundwater system) with the highest HAA5 LRAA not previously selected as a Subpart Y monitoring location.

4) The location with the highest TTHM LRAA not previously selected as a Subpart Y monitoring location.

5) The location with the highest TTHM LRAA not previously selected as a Subpart Y monitoring location.

6) The location with the highest HAA5 LRAA not previously selected as a Subpart Y monitoring location.

7) The existing Subpart I average residence time compliance monitoring location (maximum residence time compliance monitoring location for a

groundwater system) with the highest TTHM LRAA not previously selected as a Subpart Y monitoring location.

8) The location with the highest HAA5 LRAA not previously selected as a Subpart Y monitoring location.

d) The supplier may recommend locations other than those specified in subsection (c) of this Section if the supplier includes a rationale for selecting other locations. If the Agency approves the alternative locations, the supplier must monitor at these locations to determine compliance under Subpart Y of this Part.

e) The supplier's recommended schedule must include Subpart Y monitoring during the peak historical month for TTHM and HAA5 concentration, unless the Agency approves another month. Once the supplier has identified the peak historical month, and if the supplier is required to conduct routine monitoring at least quarterly, the supplier must schedule Subpart Y compliance monitoring at a regular frequency of every 90 or fewer days.

BOARD NOTE: Derived from 40 CFR 141.605 (2009)~~(2006)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART Y: STAGE 2 DISINFECTION BYPRODUCTS REQUIREMENTS

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 pursuant to Section 611.925, following the schedule set forth in Section 611.970(c), unless the Agency, by a SEP issued pursuant to Section 611.110, requires other locations or additional locations after its review. If the supplier submitted a 40/30 certification pursuant to Section 611.923, it qualified for a very small system waiver pursuant to 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) of

this Section, subject to the limitations of subsections (a)(2)(N) and (a)(2)(O) of this Section.

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~~A~~ 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~~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~~, if monitored annually)~~.

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 of this Part 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 pursuant to Section 611.972 that includes those monitoring locations.

b) Analytical 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 by USEPA or the Agency as specified in Section 611.381.

BOARD NOTE: Derived from 40 CFR 141.621 (2009)~~(2006)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART Z: ENHANCED TREATMENT FOR CRYPTOSPORIDIUM

Section 611.1004 Source Water Monitoring Requirements: Analytical Methods

a) Cryptosporidium. A supplier must analyze for Cryptosporidium using USEPA OGWDW Methods, Method 1623 (05) or USEPA OGWDW Methods, Method 1622 (05)~~, or alternative methods approved by the Agency pursuant to Section 611.480~~, each incorporated by reference in Section 611.102, or alternative methods approved by the Agency pursuant to 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) of this Section. 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) of this Section, up to a packed pellet volume of at least 2 mℓ.

2) Matrix spike (MS) samples.

A) MS samples, as required by the methods in subsection (a) of this Section, must be spiked and filtered by a laboratory approved for Cryptosporidium analysis pursuant to 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)~~, or alternative methods approved by the Agency pursuant to Section 611.480~~, incorporated by reference in Section 611.102, or alternative methods approved by the Agency pursuant to 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) of this Section.

2) The Agency may, by a SEP issued pursuant to Section 611.110, 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 Autoanalysis Colilert System reagent version of Standard Methods, 18th, 19th, or 20th ed., Method 9223 B, as 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°C and 10°C during storage and transit to the laboratory.

4) The supplier may use the membrane filtration, two-step procedure described in Standard Methods, 20th ed., Method 9222 D and G, incorporated by reference in Section 611.102.

BOARD NOTE: On June 3, 2008 (at 73 Fed. Reg. 31616), USEPA added appendix A to subpart C of 40 CFR 141 ~~of 40 CFR 141~~, which authorized alternative methods to those listed for E. coli by multiple-tube technique at corresponding 40 CFR 141.402(c)(2) to allow the use of Standard Methods for the Examination of Water and Wastewater, 20th ed., Method 9222 D and G.

c) Turbidity. A supplier must use methods for turbidity measurement approved in Section 611.531(a).

BOARD NOTE: Derived from 40 CFR 141.704 ~~(2007)~~ and appendix A to 40 CFR 141 (2009)~~, as added at 73 Fed. Reg. 31616 (June 3, 2008)~~.

(Source: Amended at 35 Ill. Reg. _____, effective _____)

SUBPART AA: AIRCRAFT DRINKING WATER RULE

Section 611.1100 Applicability and Compliance Date

a) Applicability. The requirements of this Subpart AA constitute the NPDWRs for AWSs that are PWSs and that board only finished water for human consumption. AWSs are considered transient non-community non-CWSs. To the extent there is

a conflict between the requirements in this Subpart AA and the regulatory requirements established elsewhere in this Part, this Subpart AA governs.

b) Compliance Date. AWSs must comply, unless otherwise noted, with the requirements of this Subpart AA beginning October 19, 2011. Until this compliance date, air carriers remain subject to existing NPDWRs.

BOARD NOTE: Derived from 40 CFR 141.800, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009). AWSs are transient non-CWSs. Public Health regulates non-CWSs, including transient non-CWSs. DPH has incorporated this Part into its regulations at 77 Ill. Adm. Code 900.15(a)(2)(A) and 900.20(k)(2).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1101 Definitions

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

"Air carrier" means a person who undertakes directly by lease, or other arrangement, to engage in air transportation. The air carrier is responsible for ensuring all of the aircraft it owns or operates that are PWSs comply with all provisions of this Subpart AA.

"Aircraft" means a device that is used or intended to be used for flight in the air.

"Aircraft water system" or "AWS" means an aircraft that qualifies as a PWS under the SDWA and the NPDWRs, as defined in Section 611.102. The components of an AWS include the water service panel, the filler neck of the aircraft finished water storage tank, and all finished water storage tanks, piping, treatment equipment, and plumbing fixtures within the aircraft that supply water for human consumption to passengers or crew.

"Aircraft Water System Operations and Maintenance Plan" or "AWSOMP" means the schedules and procedures for operating, monitoring, and maintaining an AWS that is included in an aircraft operation and maintenance program accepted by the Federal Aviation Administration.
BOARD NOTE: See Section 611.1104. The definition in corresponding 40 CFR 141.801, as added at 74 Fed. Reg. 53618 includes a parenthetical citation to "14 CFR 43, 14 CFR 91, 14 CFR 121."

"Finished water" means water that is introduced into the distribution system of a PWS and 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., supplemental disinfection, addition of corrosion control chemicals).

"Human consumption" means drinking, bathing, showering, hand washing, teeth brushing, food preparation, dishwashing, and maintaining oral hygiene.

"Self inspection" means an onsite review of the AWS, including the water service panel; the filler neck of the aircraft finished water storage tank; all finished water storage tanks, piping, treatment equipment, and plumbing fixtures; and a review of the aircraft operations, maintenance, monitoring, and recordkeeping for the purpose of evaluating the adequacy of such water system components and practices for providing safe drinking water to passengers and crew.

"Watering point" means the water supply, methods, and facilities used for the delivery of finished water to the aircraft. These facilities may include water trucks, carts, cabinets, and hoses.

BOARD NOTE: Derived from 40 CFR 141.801, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009). The Board has not included definitions of "Agency" and "finished water" in this Section because nearly identical definitions of these terms appear in Section 611.102 (based on 40 CFR 141.2). AWSs are transient non-CWSs. Public Health regulates non-CWSs in Illinois. Public Health has incorporated this Part 611 into its regulations at 77 Ill. Adm. Code 900.15(a)(2)(A) and 900.20(k)(2).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1102 Coliform Sampling Plan

a) Each air carrier under this Subpart AA must develop a Coliform Sampling Plan that identifies the following for each AWS owned or operated by the air carrier:

1) Coliform sample collection procedures that are consistent with the requirements of Section 611.1103(a) and (b).

2) Sample tap locations representative of the AWS, as specified in Section 611.1103(b)(2) and (b)(4).

3) The frequency and number of routine coliform samples to be collected, as specified in Section 611.1103(b)(3).

4) The frequency of routine disinfection and flushing, as specified in the AWSOMP pursuant to Section 611.1104.

5) Procedures that the air carrier will use for communicating sample results promptly, so that the air carrier can assure that any required actions, including repeat and follow-up sampling, corrective action, and notification of passengers and crew, occur in a timely manner.

b) Each air carrier must develop a Coliform Sampling Plan before April 19, 2011 for each aircraft with an AWS that meets the definition of a PWS.

c) The Coliform Sampling Plan must be included in the AWSOMP required by Section 611.1104. The air carrier must include any subsequent changes to the Coliform Sampling Plan in the AWSOMP required in Section 611.1104.

BOARD NOTE: Derived from 40 CFR 141.802, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1103 Coliform Sampling

a) Analytical methodology. An air carrier must follow the sampling and analysis requirements set forth in this Section.

1) The standard sample volume required for total coliform analysis, regardless of analytical method used, is 100 mℓ.

2) An air carrier needs to determine only the presence or absence of total coliforms or E. coli; a determination of density of these organisms is not required.

3) An air carrier must conduct analyses for total coliform and E. coli in accordance with the analytical methods approved in Section 611.526(c) and (f).

4) The time from sample collection to initiation of analysis must not exceed 30 hours.

BOARD NOTE: USEPA included the following statement in corresponding 40 CFR 141.803(a)(4): "Systems are encouraged but not required to hold samples below 10°C during transit."

5) The invalidation of a total coliform sample result can be made only by the Agency in accordance with Section 611.523(a)(1), (a)(2), or (a)(3) or by the certified laboratory in accordance with Section 611.523(b).

6) Certified laboratories. For the purpose of determining compliance with this Subpart AA, samples may be considered only if they have been analyzed by a laboratory that is certified by the Agency, USEPA, or a sister state that is authorized by USEPA pursuant to 40 CFR 142 and 42 USC 300g-2.

b) Routine monitoring. The air carrier must determine the sampling frequency for each AWS based on the disinfection and flushing frequency recommended by the AWS manufacturer, when available, and the air carrier must identify the sampling frequency in the AWSOMP required by Section 611.1104.

1) Except as provided in subsection (b)(2) of this Section, the air carrier must collect two 100 mℓ total coliform routine samples at the frequency specified in the sampling plan specified in Section 611.1102 and in accordance with subsection (b)(3) of this Section;

2) The air carrier may collect one 100 mℓ total coliform routine sample at the frequency specified in the sampling plan in Section 611.1102 for aircraft with a removable or portable tank that is drained every day of passenger service, and the aircraft has only one tap. Aircraft that meet the requirements of this subsection (b)(2) need not comply with subsection (b)(4) of this Section.

3) Air carriers must perform routine monitoring for total coliform at a frequency corresponding to the frequency of routine disinfection and flushing that is specified in the table in this subsection (b)(3) (Routine Disinfection and Flushing and Routine Sample Frequencies) based on the minimum routine sample frequency. An air carrier must follow the disinfection and flushing frequency recommended by the AWS manufacturer, when available. Where the AWS manufacturer has not specified a recommended routine disinfection and flushing frequency, the air carrier must choose a frequency from the following table:

Routine Disinfection and Flushing
and Routine Sample Frequencies

If the minimum routine disinfection and flushing per aircraft is as follows:	The required minimum frequency of routine samples per aircraft is as follows:
At least four times per year = At least once within every three-month period (quarterly)	At least once per year = At least once within every 12-month period (annually)

At least three times per year = At least once within every four-month period	At least twice per year = At least once within every six-month period (semi-annually)
At least twice per year = At least once within every six-month period (semi-annually)	At least four times per year = At least once within every three-month period (quarterly)
At least once per year or less = At least once within every 12-month period (annually) or less	At least 12 times per year = At least once every month (monthly)

4) The AWS supplier must take one sample from a lavatory and one from a galley; each sample must be analyzed for total coliform. If only one water tap is located in the AWS due to aircraft model type and construction, then the supplier may use a single tap to collect two separate 100 mℓ samples.

5) If any routine, repeat, or follow-up coliform sample is total coliform-positive, the air carrier must analyze that total coliform-positive culture medium to determine if E. coli is present.

6) Routine total coliform samples must not be collected within 72 hours after completing routine disinfection and flushing procedures.

c) Routine coliform sample results.

1) Negative routine coliform sample results. If all routine sample results are total coliform-negative, then the air carrier must maintain the routine monitoring frequency for total coliform, as specified in the Coliform Sampling Plan required by Section 611.1102.

2) Positive routine E. coli sample results. If any routine sample is E. coli-positive, the air carrier must perform all of the following:

A) Restrict public access. The air carrier must restrict public access to the AWS in accordance with subsection (d) of this Section as expeditiously as possible, but in no case later than 24 hours after the laboratory notifies the air carrier of the E. coli-positive result or discovery of the applicable failure, as specified in subsections (g) and (h) of this Section. All public access restrictions, including applicable public notification requirements, must remain in-place until the AWS has been disinfected and flushed and a complete set of follow-up samples is total coliform-negative;

B) Disinfect and flush. The air carrier must conduct disinfection and flushing in accordance with Section 611.1104(b)(2). If the AWS cannot be physically disconnected or shut off, or the flow of water otherwise prevented through the taps, then the air carrier must disinfect and flush the system no later than 72 hours after the laboratory notifies the air carrier of the E. coli-positive result or discovery of the applicable failure, as specified in subsections (g) and (h) of this Section; and

C) Follow-up sampling. The air carrier must collect follow-up samples in accordance with subsection (e) of this Section. A complete set of follow-up sample results must be total coliform-negative before the air carrier provides water for human consumption from the AWS and returns to the routine monitoring frequency, as specified in the Coliform Sampling Plan required by Section 611.1102.

3) Positive routine total coliform sample results. If any routine sample is total coliform-positive and E. coli-negative, then the air carrier must perform at least one of the following three corrective actions and continue through with that action until a complete set of follow-up or repeat samples is total coliform-negative:

A) Disinfect and flush. In accordance with Section 611.1104(b)(2), the air carrier must conduct disinfection and flushing of the system no later than 72 hours after the laboratory notifies the air carrier of the total coliform-positive and E. coli-negative result. After disinfection and flushing is completed, the air carrier must collect follow-up samples in accordance with subsection (e) of this Section prior to providing water for human consumption from the AWS. A complete set of followup sample results must be total coliform-negative before the air carrier may return to the routine monitoring frequency specified in the sampling plan required by Section 611.1102;

B) Restrict public access. In accordance with subsection (d) of this Section, the air carrier must restrict public access to the AWS as expeditiously as possible, but in no case later than 72 hours after the laboratory notifies the air carrier of the total coliform-positive and E. coli-negative result or discovery of the applicable failure, as specified in subsections (f), (g), and (i) of this Section. All public access restrictions, including applicable public notification requirements, must remain in-place until the AWS has been

disinfected and flushed, and a complete set of follow-up samples has been collected. The air carrier must conduct disinfection and flushing in accordance with Section 611.1104(b)(2). After disinfection and flushing is completed, the air carrier must collect follow-up samples in accordance with subsection (e) of this Section prior to providing water for human consumption from the AWS. A complete set of followup sample results must be total coliform-negative before the air carrier returns to the routine monitoring frequency specified in the sampling plan required by Section 611.1102; or

C) Repeat sampling. The air carrier must collect three 100 mℓ repeat samples no later than 24 hours after the laboratory notifies the air carrier of the routine total coliform-positive and E. coli-negative result. Repeat samples must be collected and analyzed from three taps within the aircraft as follows: the tap which resulted in the total coliform-positive sample, one other lavatory tap, and one other galley tap. If fewer than three taps exist, then a total of three 100 mℓ samples must be collected and analyzed from the available taps within the AWS.

i) If all repeat samples are total coliform-negative, then the air carrier must maintain the routine monitoring frequency for total coliform specified in the sampling plan in Section 611.1102.

ii) If any repeat sample is E. coli-positive, the air carrier must perform all the corrective actions specified in subsections (c)(2)(A), (c)(2)(B), and (c)(2)(C) of this Section.

iii) If any repeat sample is total coliform-positive and E. coli-negative, then the air carrier must perform the corrective actions specified in subsection (c)(3)(A) or (c)(3)(B) of this Section, and continue that action until a complete set of follow-up samples is total coliform-negative.

d) Restriction of public access. Restriction of public access to the AWS includes, but need not be limited to, the following:

1) Physically disconnecting or shutting off the AWS, where feasible, or otherwise preventing the flow of water through the taps;

2) Providing public notification to passengers and crew in accordance with Section 611.1105;

3) Providing alternatives to water from the AWS, such as bottled water for drinking and coffee or tea preparation; antiseptic hand gels or wipes that comply with the requirements of 21 CFR 333, incorporated by refererence in Section 611.102, in the galleys and lavatories; and other feasible measures that reduce or eliminate the need to use the AWS during the limited period before public use of the AWS is unrestricted.

e) Post disinfection and flushing follow-up sampling. Following corrective action disinfection and flushing, an air carrier must comply with post-disinfection and flushing follow-up sampling procedures that, at a minimum, consist of the following:

1) For each AWS, the air carrier must collect a complete set of total coliform follow-up samples consisting of two 100 mℓ total coliform samples at the same routine sample locations that are identified in subsections (b)(2) and (b)(4) of this Section.

2) The air carrier must collect follow-up samples prior to providing water to the public for human consumption from the AWS.

3) If a complete set of follow-up samples is total coliform-negative, the air carrier must return to the routine monitoring frequency for total coliform that is specified in the Coliform Sampling Plan required by Section 611.1102.

4) If any follow-up sample is E. coli-positive, the air carrier must perform all the corrective actions that are specified in subsections (c)(2)(A), (c)(2)(B), and (c)(2)(C) of this Section.

5) If any follow-up sample is total coliform-positive and E. coli-negative, the air carrier must restrict public access to the AWS in accordance with subsection (d) of this Section as expeditiously as possible, but in no case later than 72 hours after the laboratory notifies the air carrier of the total coliform-positive and E. coli-negative result. All public access restrictions, including applicable public notification requirements, must remain in-place until the AWS has been disinfected and flushed in accordance with Section 611.1104(b)(2) and a complete set of follow-up samples is total coliform-negative. The air carrier must collect follow-up samples in accordance with subsection (e) of this Section. A complete set of follow-up sample results must be total coliform-negative before the air

carrier provides water for human consumption from the AWS and returns to the routine monitoring frequency for coliform that is specified in the Coliform Monitoring Plan required by Section 611.1102.

f) Failure to perform required routine disinfection and flushing or failure to collect required routine samples. If the air carrier fails to perform routine disinfection and flushing or fails to collect and analyze the required number of routine coliform samples, the air carrier must perform all the corrective actions that are specified in subsection (c)(3)(B) of this Section.

g) Failure to collect repeat or follow-up samples. If the air carrier fails to collect and analyze the follow-up samples required as a result of an E. coli-positive result, then the air carrier must perform all the corrective actions specified in subsections (c)(2)(A), (c)(2)(B), and (c)(2)(C) of this Section. If the air carrier fails to collect and analyze the repeat samples or follow-up samples required as a result of a total coliform-positive and E. coli-negative result, then the air carrier must perform all the corrective actions that are specified in subsection (c)(3)(B) of this Section.

h) Failure to board water from a safe watering point (E. coli-positive). The air carrier must perform all the corrective actions that are specified for the AWS in subsections (c)(2)(A), (c)(2)(B), and (c)(2)(C) of this Section when the air carrier becomes aware of an E. coli-positive event resulting from any of the following events:

1) Boarding water from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102;

2) Boarding water that does not meet the NPDWRs applicable to transient non-CWS suppliers (Sections 611.301 (Revised MCLs for Inorganic Chemical Contaminants) and 611.325 (Microbiological Contaminants), to the extent that these provisions apply to a transient non-CWS); or

3) Boarding water that is otherwise determined to be unsafe due to noncompliance with the procedures specified in the air carrier's AWSOMP pursuant to Section 611.1104(b)(6).

i) Failure to board water from a safe watering point (non-E. coli-positive). The air carrier must perform all the corrective actions that are specified for the AWS in subsection (c)(3)(B) of this Section when the air carrier becomes aware of a non-E. coli-positive event resulting from any of the following events:

1) Boarding water from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102;

2) Boarding water that does not meet the NPDWRs applicable to transient non-CWS suppliers (Sections 611.301 (Revised MCLs for Inorganic Chemical Contaminants) and 611.325 (Microbiological Contaminants), to the extent that these provisions apply to a transient non-CWS); or

3) Boarding water that is otherwise determined to be unsafe due to noncompliance with the procedures specified in the air carrier's AWSOMP pursuant to Section 611.1104(b)(6).

BOARD NOTE: Derived from 40 CFR 141.803, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1104 Aircraft Water System Operations and Maintenance Plan

a) Each air carrier must develop and implement an aircraft water system operation and maintenance plan (AWSOMP) for each AWS that it owns or operates. The air carrier must include this AWSOMP in a Federal Aviation Administration (FAA)-accepted air carrier operations and maintenance program.

BOARD NOTE: Corresponding 40 CFR 141.804(a), as added at 74 Fed. Reg. 53618 includes a parenthetical citation to "14 CFR 43, 14 CFR 91, 14 CFR 121."

b) Each AWSOMP must include the following information and procedures:

1) Watering point selection requirements. The AWSOMP must include information and procedures which ensure that all watering points are selected in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102.

2) Procedures for disinfection and flushing. The AWSOMP must include information and procedures for disinfection and flushing of the AWS that ensure compliance with the following requirements:

A) The air carrier must conduct disinfection and flushing of the AWS in accordance with, or that is consistent with, the AWS manufacturer's recommendations. The air carrier may conduct disinfection and flushing more frequently, but not less frequently, than the manufacturer recommends.

B) The AWSOMP must identify the disinfection frequency, type of disinfecting agent, disinfectant concentration that must be used, and disinfectant contact time, and flushing volume or flushing time.

C) Where a recommended routine disinfection and flushing frequency is not specified by the AWS manufacturer, the air carrier must choose a disinfection and flushing, and corresponding monitoring, frequency specified in Section 611.1103(b)(3).

3) Follow-up sampling. The AWSOMP must include the procedures for follow-up sampling that comply with Section 611.1103(e).

4) Training requirements. Training for all personnel involved with the AWS operation and maintenance provisions of this Section must include, but is not limited to, the following information and procedures:

A) Boarding water procedures;

B) Sample collection procedures;

C) Disinfection and flushing procedures; and

D) Explanation of public health and safety reasons for the requirements of this Subpart AA.

5) Procedures for conducting self-inspections of the AWS. Procedures must include, but are not limited to, inspection of storage tank, distribution system, supplemental treatment, fixtures, valves, and backflow prevention devices.

6) Procedures for boarding water. The AWSOMP must include the following requirements and procedures for boarding water:

A) Within the United States, the air carrier must board water from watering points in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102;

B) A description of how the water must be transferred from the watering point to the aircraft in a manner which ensures that the water will not become contaminated during the transfer;

C) A description of how the air carrier will ensure that water boarded outside the United States is safe for human consumption; and

D) A description of emergency procedures that meet the requirements in Section 611.1103(h) and (i), which must be used when the air carrier becomes aware that water was boarded to operate essential systems, such as toilets, but was boarded from a watering point that does not comply with the requirements of subpart E of 21 CFR 1240, incorporated by reference in Section 611.102; the boarded water does not meet NPDWRs applicable to transient non-CWS suppliers (Sections 611.301 (Revised MCLs for Inorganic Chemical Contaminants) and 611.325 (Microbiological Contaminants), to the extent that these provisions apply to a transient non-CWS); or the boarded water is otherwise unsafe.

7) Coliform Sampling Plan. The air carrier must include the Coliform Sampling Plan prepared pursuant to Section 611.1102.

8) AWS disconnect/shut-off, or preventing flow of water through the taps statement. An explanation of whether the AWS can be physically disconnected or shut off, or the flow of water otherwise prevented through the taps to the crew and passengers.

c) For existing aircraft, the air carrier must develop the AWSOMP required by this Section before April 19, 2011.

d) For new aircraft, the air carrier must develop the AWSOMP required by this Section within the first calendar quarter of initial operation of the aircraft.

e) Any changes to the AWSOMP must be included in the FAA-accepted air carrier operations and maintenance program.

BOARD NOTE: Derived from 40 CFR 141.804, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1105 Notification to Passengers and Crew

a) An air carrier must give public notice that satisfies the requirements of this Section for each aircraft in any of the following situations:

1) Public access to the AWS is restricted in response to a routine, repeat or follow-up total coliform-positive or E. coli-positive sample result obtained pursuant to Section 611.1103(d);

2) A failure to perform required routine disinfection and flushing or failure to collect required routine samples as required by Section 611.1103(f);

3) A failure to collect the required follow-up samples in response to a sample result that is E. coli-positive in accordance with Section 611.1103(g);

4) A failure to collect the required repeat samples or a failure to collect the required follow-up samples in response to a sample result that is total coliform-positive and E. coli-negative as required by Section 611.1103(g);

5) A failure to board water from a safe watering point (E. coli-positive), as such is determined pursuant to Section 611.1103(h);

6) A failure to board water from a safe watering point (non-E. coli-positive), as such is determined pursuant to Section 611.1103(i); or

7) USEPA, the Agency, a sister state that USEPA has authorized pursuant to 40 CFR 142 and 42 USC 300g-2 to administer the requirements of the ADWR, the air carrier, or the crew otherwise determines that notification is necessary to protect public health.

b) Public notification must fulfill the following requirements:

1) The public notification must be displayed in a conspicuous way when printed or posted;

2) The public notification must not contain overly technical language or very small print;

3) The public notification must not be formatted in a way that defeats the purpose of the notice;

4) The public notification must not contain language that nullifies the purpose of the notice; and

5) The public notification must contain information in the appropriate languages regarding the importance of the notice, reflecting a good faith effort to reach the non-English-speaking segments of the population

served, including, where applicable, an easily recognized symbol for non-potable water.

c) Public notification given pursuant to subsection (a)(1) of this Section must fulfill the requirements of this subsection (c), in addition to those of subsection (b) of this Section:

1) Public notification must include a prominently displayed, clear statement in each lavatory indicating that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use; and

2) A prominent notice in the galley directed at the crew that includes the following information:

A) A clear statement that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use;

B) A description of the violation or situation triggering the notice, including the contaminants of concern;

C) A statement describing when the violation or situation occurred that gave rise to the notice;

D) A description of any potential adverse health effects that could result from the violation or situation, as appropriate to fulfill the requirements of subsection (g) of this Section;

E) A description of the population at risk, including a description of sensitive subpopulations particularly vulnerable if exposed to the contaminant in the drinking water;

F) A description of what the air carrier is doing to correct the violation or situation; and

G) A description of when the air carrier expects to return the system to unrestricted public access.

3) If passenger access to the water system is physically prevented through disconnecting or shutting off the water, or the flow of water prevented through the taps, or if water is supplied only to lavatory toilets, and not to

any lavatory or galley taps, then only the notice specified in subsection (c)(2) of this Section is required.

4) An air carrier must initiate public notification when restriction of public access is initiated in accordance with Section 611.1103(d), and the air carrier must continue the public notification until the AWS is returned to unrestricted public access.

d) Public notification given pursuant to subsections (a)(2), (a)(4), and (a)(6) of this Section must fulfill the requirements of this subsection (d), in addition to those of subsection (b) of this Section:

1) Public notification must include a prominently displayed, clear statement in each lavatory indicating that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use; and

2) A prominent notice in the galley directed at the crew which includes:

A) A clear statement that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use;

B) A clear statement of the failure that gave rise to the requirement for public notification, i.e., that the air carrier does not know whether the water is contaminated because there was a failure to perform required routine disinfection and flushing; that there was a failure to perform required monitoring; that water was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102; that water was boarded which does not meet NPDWRs applicable to transient non-CWS suppliers; or that boarded water is otherwise determined to be unsafe due to noncompliance with the procedures specified in Section 611.1104(b)(6);

C) A statement describing when and where the unsafe water was boarded or when the specific monitoring or disinfection and flushing requirement was not met;

D) A description of any potential adverse health effects from exposure to waterborne pathogens that might be in the water, as appropriate to fulfill the requirements of subsection (g) of this Section;

E) A description of the population at risk, including a description of sensitive subpopulations particularly vulnerable if exposed to the contaminant in the drinking water; and

F) A statement indicating when the system will be disinfected and flushed and returned to unrestricted public access.

3) If passenger access to the water system is physically prevented through disconnecting or shutting off the water, or the flow of water prevented through the taps, or if water is supplied only to lavatory toilets, and not to any lavatory or galley taps, then only the notice specified in subsection (d)(2) of this Section is required.

4) An air carrier must initiate public notification when restriction of public access is initiated in accordance with Section 611.1103(d), and the air carrier must continue the public notification until the AWS is returned to unrestricted public access.

e) Public notification given pursuant to subsections (a)(3) and (a)(5) of this Section must fulfill the requirements of this subsection (e), in addition to those of subsection (b) of this Section:

1) Public notification must include a prominently displayed, clear statement in each lavatory indicating that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use; and

2) A prominent notice in the galley directed at the crew which includes:

A) A clear statement that the water is non-potable and should not be used for drinking, food or beverage preparation, hand washing, teeth brushing, or any other consumptive use;

B) A clear statement that the water is contaminated and that there was a failure to conduct required monitoring; or a clear statement that the water is contaminated because water was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102; that water was boarded which does not meet NPDWRs applicable to transient non-CWS suppliers; or that water boarded is otherwise determined to be unsafe due to noncompliance with the procedures specified in Section 611.1104(b)(6);

C) A description of the contaminants of concern;

D) A statement describing when and where the unsafe water was boarded or when the specific monitoring requirement was not met;

E) A description of any potential adverse health effects from the situation, as appropriate to fulfill the requirements of subsection (g) of this Section;

F) A description of the population at risk, including a description of sensitive subpopulations particularly vulnerable if exposed to the contaminant in the drinking water;

G) A statement indicating what the air carrier is doing to correct the situation; and

H) When the air carrier expects to return the system to unrestricted public access.

3) If passenger access to the water system is physically prevented through disconnecting or shutting off the water, or the flow of water prevented through the taps, or if water is supplied only to lavatory toilets, and not to any lavatory or galley taps, then only the notice specified in subsection (e)(2) of this Section is required.

4) An air carrier must initiate public notification when restriction of public access is initiated in accordance with Section 611.1103(d), and the air carrier must continue the public notification until a complete set of required follow-up samples are total coliform-negative.

f) Public notification given pursuant to subsection (a)(7) of this Section must fulfill the requirements of this subsection (f), in addition to those of subsection (b) of this Section:

1) Notification must be in a form and manner reasonably calculated to reach all passengers and crew while on board the aircraft by using one or more of the following forms of delivery:

A) Broadcast over public announcement system on aircraft;

B) Posting of the notice in conspicuous locations throughout the area served by the AWS. These locations would normally be the galleys and in the lavatories of each aircraft requiring posting;

C) Hand delivery of the notice to passengers and crew; or

D) Another delivery method approved in writing by the Agency.

2) An air carrier must initiate public notification within 24 hours after being informed by USEPA, the Agency, or a sister state that USEPA has authorized pursuant to 40 CFR 142 and 42 USC 300g-2 to administer the requirements of the ADWR to undertake notification, and the air carrier must continue the public notification for the duration determined by USEPA, the Agency, or a sister state.

g) In each public notice to the crew, air carriers must use the appropriate of the following standard health effects language in response to the situations described in subsections (a)(1) through (a)(6) of this Section.

1) Health effects language to be used when public notice is initiated due to the detection of total coliforms only (not E. coli) as described in subsection (a)(1) of this Section:

> Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present. Coliforms were found in [insert number of samples detected] samples collected, and this is a warning of potential problems. If human pathogens are present, they can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. These microbes may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

2) Health effects language to be used when public notice is initiated due to any E. coli-positive routine, repeat, or follow-up sample as required by subsection (a)(1) of this Section:

> E. coli are bacteria 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. These microbes may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

3) Health effects language to be used when public notice is initiated due to a failure to conduct routine monitoring or routine disinfection and flushing as required by subsection (a)(2) of this Section; when there is a failure to conduct repeat or follow-up sampling as required by subsection (a)(4) of this Section; as required by subsection (a)(6) of this Section, when the air carrier becomes aware of a non-E. coli-positive event that is the result of water that was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102; that water was boarded which does not meet NPDWRs applicable to transient non-CWS suppliers; or that water boarded is otherwise determined to be unsafe due to noncompliance with the procedures specified in Section 611.1104(b)(6):

> Because [use the appropriate of the following alternative statements: required monitoring and analysis was not conducted, required disinfection and flushing was not conducted, water was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, or other appropriate explanation], we cannot be sure of the quality of the drinking water at this time. However, drinking water contaminated with human pathogens 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.

4) Health effects language to be used when public notice is initiated due to a failure to conduct required follow-up monitoring in response to a sample result that is E. coli-positive, as required by subsection (a)(3) of this Section; or when the air carrier becomes aware of an E. coli-positive event that is the result of water which was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, incorporated by reference in Section 611.102; or water was boarded that does not meet NPDWRs applicable to transient non-CWS suppliers; or water was boarded that is otherwise determined to be unsafe due to noncompliance with the procedures specified in Section 611.1104(b)(6), as required by subsection (a)(5) of this Section:

> Because required follow-up monitoring and analysis was not conducted after the AWS tested positive for E. coli, we cannot be sure of the quality of the drinking water at this time. E. coli are bacteria 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. These microbes may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

or

Water was boarded that is contaminated with E. coli because [use the appropriate of the following alternative statements: water was boarded from a watering point not in accordance with subpart E of 21 CFR 1240, or other appropriate explanation]. E. coli are bacteria 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. These microbes may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

BOARD NOTE: Derived from 40 CFR 141.805, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1106 Reporting Requirements

a) The air carrier must comply with the following requirements regarding reporting of the development of the Coliform Sampling Plan, the AWSOMP, and the disinfection and flushing and coliform sampling frequencies.

1) Before April 19, 2011, the air carrier must report the following to the Agency:

A) The air carrier must report that it has developed a Coliform Sampling Plan, as required by Section 611.1102, which covers each existing AWS, as well as report the frequency for routine coliform sampling identified in the Coliform Sampling Plan; and

B) The air carrier must report to the Agency that it has developed its AWSOMP, as required by Section 611.1104, and report the frequency for routine disinfection and flushing.

2) For each new aircraft meeting the definition of an AWS that becomes operational after October 19, 2009, the air carrier must report the following to the Agency within the first calendar quarter of initial operation of the aircraft:

A) The air carrier must report that it has developed a Coliform Sampling Plan, as required by Section 611.1102, as well as report the frequency for routine coliform sampling identified in the Coliform Sampling Plan; and

B) The air carrier must report to the Agency that it has developed the AWSOMP, as required by Section 611.1104, and report the frequency for routine disinfection and flushing.

b) The air carrier must report the following information to the Agency:

1) Before April 19, 2011 , the air carrier must report a complete inventory of its aircraft that are PWSs. The inventory information required includes, at a minimum, the following information:

A) The unique aircraft identifier number;

B) The status (active or inactive) of any aircraft as an AWS, as defined in Section 611.1101;

C) The type and location of any supplemental treatment equipment installed on the AWS; and

D) Whether the AWS can be physically disconnected or shut off, or the flow of water prevented through the taps.

2) The air carrier must report no later than 10 days following the calendar month in which the change occurred any changes in aircraft inventory. Changes in inventory information include, at a minimum, the following information:

A) Any change in the unique identifier number for any new aircraft, or for any aircraft removed from the air carrier's fleet;

B) Any change in status (active or inactive) of any aircraft as an AWS, as defined in Section 611.1101;

C) Any change to the type and location of any supplemental treatment equipment added to or removed from the AWS; and

D) Any change to whether the AWS can be physically disconnected or shut off, or the flow of water prevented through the taps.

3) The air carrier must report all sampling results no later than 10 calendar days following the monitoring period in which the sampling occurred. The monitoring period is based on the monitoring frequency identified in the Coliform Sampling Plan required by Section 611.1102. Routine disinfection and flushing events must be reported no later than 10 calendar days following the disinfection and flushing period in which the disinfection and flushing occurred. The disinfection and flushing period is based on the frequency identified in the AWSOMP required by Section 611.1104.

4) The air carrier must report within 10 days after any event (e.g., notification of positive sample result by laboratory) that requires notification to passengers or crew, non-routine disinfection and flushing, or non-routine sampling, including information as to whether required notification was provided to passengers or crew or both.

5) The air carrier must report within 10 calendar days after discovery of any failure to comply with the monitoring or disinfection and flushing requirements of this Subpart AA.

6) The air carrier must report no later than 10 days following the end of a calendar month in which any changes occurred in disinfection and flushing and coliform sampling frequencies. Changes to an aircraft's routine coliform sampling frequency and routine disinfection and flushing frequency must be included in the AWSOMP that is included in the air carrier operations and maintenance program accepted by FAA as required by Section 611.1104.

c) The air carrier must provide evidence to the Agency within 90 days after completion of a self-inspection required by Section 611.1108(b), including reporting whether the air carrier addressed all deficiencies as required by Section 611.1108(c). The air carrier must also report to the Agency within 90 days that any deficiency identified during a compliance audit conducted in accordance with Section 611.1108(a) has been addressed. If the air carrier has not addressed any deficiency within 90 days after identification of the deficiency, the report must also include a description of the deficiency, an explanation as to why the air

carrier has not yet addressed the deficiency, and a schedule for addressing the deficiency as expeditiously as possible.

d) All information required to be reported to the Agency under this Subpart AA must be in an electronic format established or approved by the Agency. If an air carrier is unable to report electronically, the air carrier may use an alternative approach that the Agency has approved.

BOARD NOTE: Derived from 40 CFR 141.806, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1107 Recordkeeping Requirements

a) The air carrier must keep records of bacteriological analyses for at least five years and must include the following information:

1) The date, time, and place of sampling, and the name of the person who collected the sample;

2) Identification of the sample as a routine, repeat, follow-up, or other special purpose sample;

3) The date of the analysis;

4) The laboratory and person responsible for performing the analysis;

5) The analytical technique or method used; and

6) The results of the analysis.

b) The air carrier must keep records of any disinfection and flushing for at least five years and must include the following information:

1) The date and time of the disinfection and flushing; and

2) The type of disinfection and flushing (i.e., routine or corrective action).

c) The air carrier must keep records of a self-inspection for at least 10 years and must include the following information:

1) The completion date of the self-inspection; and

2) Copies of any written reports, summaries, or communications related to the self-inspection.

d) The air carrier must maintain sampling plans and make such plans available for review by the Agency upon request, including during compliance audits.

e) The air carrier must maintain AWSOMPs in accordance with FAA requirements, and make such plans available for review by the Agency upon request, including during compliance audits.

f) The air carrier must keep copies of public notices to passengers and crew issued as required by this Subpart AA for at least three years after issuance.

BOARD NOTE: Derived from 40 CFR 141.807, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1108 Audits and Inspections

a) The Agency may conduct routine compliance audits as deemed necessary in providing regulatory oversight to ensure proper implementation of the requirements in this Subpart AA. Compliance audits may include, but are not limited to the following:

1) Bacteriological sampling of AWSs;

2) Reviews and audits of records as they pertain to AWS operations and maintenance such as log entries, disinfection and flushing procedures, and sampling results; and

3) Observation of procedures involving the handling of finished water, watering point selection, boarding of water, operation, disinfection and flushing, and general maintenance and self-inspections of AWSs.

b) Air carriers or their representatives must perform a self-inspection of all water system components for each AWS no less frequently than once every five years.

c) The air carrier must address any deficiency identified during compliance audits or routine self-inspections within 90 days after identification of the deficiency, or where such deficiency is identified during extended or heavy maintenance, before the aircraft is put back into service. This includes any deficiency in the AWS's design, construction, operation, maintenance, or administration, as well as any

failure or malfunction of any system component that has the potential to cause an unacceptable risk to health or that could affect the reliable delivery of safe drinking water.

BOARD NOTE: Derived from 40 CFR 141.808, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1109 Supplemental Treatment

a) Any supplemental drinking water treatment units installed onboard existing or new aircraft must be acceptable to FAA and FDA; and must be installed, operated, and maintained in accordance with the manufacturer's plans and specifications and FAA requirements.

b) Water supplemental treatment and production equipment must produce water that meets the standards prescribed in this Part.

BOARD NOTE: Derived from 40 CFR 141.809, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.1110 Violations

An air carrier is in violation of this Subpart AA when, for any AWS it owns or operates, any of the following occurs:

a) The air carrier fails to perform any of the requirements set forth in Sections 611.1103 and 611.1104;

b) The air carrier has an E. coli-positive sample in any monitoring period (routine and repeat samples are used in this determination);

c) The air carrier fails to provide notification to passengers and crew in accordance with Section 611.1105;

d) The air carrier fails to comply with the reporting and recordkeeping requirements of this Subpart AA;

e) The air carrier fails to conduct a self-inspection or address a deficiency in accordance with Section 611.1108; or

f) The air carrier fails to develop a Coliform Sampling Plan in accordance with Section 611.1102, or fails to have and follow an AWSOMP that is included in an FAA-accepted operation and maintenance program in accordance with Section 611.1104.

BOARD NOTE: Derived from 40 CFR 141.810, as added at 74 Fed. Reg. 53590 (Oct. 19, 2009).

(Source: Added at 35 Ill. Reg. _____, effective _____)

Section 611.APPENDIX F Mandatory Lead Public Education Information for Non-Transient Non-Community Water Systems

1) INTRODUCTION

The United States Environmental Protection Agency (USEPA) and (insert name of water supplier) are concerned about lead in your drinking water. Some drinking water samples taken from this facility have lead levels above the USEPA action level of 15 parts per billion (ppb), or 0.015 milligrams of lead per liter of water (mg/ℓ). Under Federal law we are required to have a program in place to minimize lead in your drinking water by (insert date when corrosion control will be completed for your system). This program includes corrosion control treatment, source water treatment, and public education. We are also required to replace the portion of each lead service line that we own if the line contributes lead concentrations of more than 15 ppb after we have completed the comprehensive treatment program. If you have any questions about how we are carrying out the requirements of the lead regulation please give us a call at (insert water system's phone number). This brochure explains the simple steps you can take to protect you and your family by reducing your exposure to lead in drinking water.

2) HEALTH EFFECTS OF LEAD

Lead is found throughout the environment in lead-based paint; air; soil; household dust; food; certain types of pottery, porcelain, and pewter; and water. Lead can pose a significant risk to your health if too much of it enters your body. Lead builds up in the body over many years and can cause damage to the brain, red blood cells, and kidneys. The greatest risk is to young children and pregnant women. Amounts of lead that won't hurt adults can slow down normal mental and physical development of growing bodies. In addition, a child at play often comes into contact with sources of lead contamination – like dirt and dust – that rarely affect an adult. It is important to wash children's hands and toys often, and to try to make sure they only put food in their mouths.

3) LEAD IN DRINKING WATER

A) Lead in drinking water, although rarely the sole cause of lead poisoning, can significantly increase a person's total lead exposure, particularly the exposure of infants who drink baby formulas and concentrated juices that are mixed with water. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead.

B) Lead is unusual among drinking water contaminants in that it seldom occurs naturally in water supplies like rivers and lakes. Lead enters drinking water primarily as a result of the corrosion, or wearing away, of materials containing lead in the water distribution system and household plumbing. These materials include lead-based solder used to join copper pipe, brass, and chrome plated brass

faucets, and in some cases, pipes made of lead that connect houses and buildings to the water main (service lines). In 1986, Congress banned the use of lead solder containing greater than 0.2% lead, and restricted the lead content of faucets, pipes, and other plumbing materials to 8.0%.

C) When water stands in lead pipes or plumbing systems containing lead for several hours or more, the lead may dissolve into your drinking water. This means the first water drawn from the tap in the morning, or later in the afternoon after returning from work or school, can contain fairly high levels of lead.

4) STEPS YOU CAN TAKE TO REDUCE EXPOSURE TO LEAD IN DRINKING WATER

A) Let the water run from the tap before using it for drinking or cooking any time the water in a faucet has gone unused for more than six hours. The longer water resides in plumbing the more lead it may contain. Flushing the tap means running the cold water faucet until the water gets noticeably colder, usually about 15-30 seconds. Although toilet flushing or showering flushes water through a portion of the plumbing system, you still need to flush the water in each faucet before using it for drinking or cooking. Flushing tap water is a simple and inexpensive measure you can take to protect your family's health. It usually uses less than one gallon.

B) Do not cook with or drink water from the hot water tap. Hot water can dissolve more lead more quickly than cold water. If you need hot water, draw water from the cold tap and heat it.

C) The steps described above will reduce the lead concentrations in your drinking water. However, if you are still concerned, you may wish to use bottled water for drinking and cooking.

D) You can consult a variety of sources for additional information. Your family doctor or pediatrician can perform a blood test for lead and provide you with information about the health effects of lead. State and local government agencies that can be contacted include the following:

i) (Insert the name or title of facility official if appropriate) at (insert phone number) can provide you with information about your facility's water supply; and

ii) The Illinois Department of Public Health at 217-782-4977 or 312-814-2608 or the (insert the name of the city or county health department) at (insert phone number) can provide you with information about the health effects of lead.

BOARD NOTE: Derived from 40 CFR 141.85(a)(2) (2009)~~(2002)~~. The Department of Public Health (Department) regulates non-community water supplies, including non-transient, non-community water supplies. The Department has incorporated this Part into its regulations at 77 Ill. Adm. Code 900.15(a)(2)(A) and 900.20(k)(2). Thus, the Board has included the notice language of 40 CFR 141.85(a)(2) in~~as~~ this Section for the purposes of facilitating federal review and authorization of the Illinois drinking water regulations.

(Source: Amended at 35 Ill. Reg. _____, effective _____)