ILLINOIS POLLUTION CONTROL BOARD
October 5, 1989

IN THE MATTER OF:	)	
	)	
SAFE DRINKING WATER ACT	)	R88-26
REGULATIONS	)	
	)	

PROPOSAL FOR PUBLIC COMMENT

PROPOSED ORDER OF THE BOARD (by J. Anderson):

Pursuant to Section 17.5 of the Environmental Protection Act (Act), the Board is proposing to adopt regulations which are identical in substance to USEPA regulations implementing the Safe Drinking Water Act (SDWA). This involves the repeal of existing 35 Ill. Adm. Code 604, 605, 606 and 607, and adoption of a new 35 Ill. Adm. Code 611, the text of which is attached.

The Board directs that the proposal be published in the Illinois Register. The Board will receive public comment for a period of 45 days after the date of publication in the Illinois register.

This Proposed Order is supported by a Proposed Opinion adopted this same day.

IT IS SO ORDERED

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Order was adopted on the 5th day of October, 1989, by a vote of 6-0.

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

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

PART 611
PRIMARY DRINKING WATER STANDARDS

SUBPART A: GENERAL

SUBPART B: FILTRATION AND DISINFECTION

SUBPART C: USE OF NON-CENTRALIZED TREATMENT DEVICES

SUBPART F: MAXIMUM CONTAMINANT LEVELS (MCL's)

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SUBPART O: ORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

SUBPART P: TRIHALOMETHANE MONITORING AND ANALYTICAL REQUIREMENTS

SUBPART Q: RADIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

SUBPART T: REPORTING, PUBLIC NOTIFICATION AND RECORDKEEPING

AUTHORITY: Implementing Sections 17 and 17.5 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1987 ch. 111 1/2, pars. 1017, 1017.5 and 1027.

SOURCE: Adopted in R88-26 at 14 Ill. Reg. , effective

SUBPART A: GENERAL

Section 611.100 Purpose, Scope and Applicability

a) This Part satisfies the requirement of Section 17.5 of the Environmental Protection Act (Act) (Ill. Rev. Stat. 1987 ch. 111 1/2. par. 1001 et seq.) that the Board adopt regulations which are identical in substance with federal regulations promulgated by the United States Environmental Protection Agency (USEPA) pursuant to Sections 1412(b), 1414(c), 1417(a) and 1445 of the Safe Drinking Water Act (42 U.S.C. 300f et seq.)

b) This Part establishes primary drinking water regulations (NPDWRs) pursuant to the SDWA, and also includes additional, related State requirements which are consistent with and more stringent than the USEPA regulations (Section 7.2 of the Act)

c) This Part applies to owners and operators of "public water supplies" ("PWSs"), as provided in Section 611.110. PWSs include community water supplies ("CWSs"), "non-community water supplies ("non-CWSs") and "non-transient non-community water systems ("NTNCWSs"), as these terms are defined in Section 611.101.

d) This Part also applies to activities of certain other persons as they affect a PWS. For example, Section 611.126 prohibits the use of lead pipe, solder or flux in the installation or repair of any plumbing providing water for human consumption which is connected to a PWS.

BOARD NOTE: Derived from 40 CFR 141.1 (1987).

Section 611.101 Definitions

As used in this Part, the term:

"Act" means the Environmental Protection Act, Ill. Rev. Stat. 1987, ch. 111 1/2, par. 1001 et seq.

"Agency" means the Illinois Environmental Protection Agency.

"Best available technology" or "BAT" means the best technology, treatment techniques or other means which USEPA has found are available for the contaminant in question. For the purposes of setting MCLs for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

"Board" means the Illinois Pollution Control Board.

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

"CT" or "CTcalc" 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 PWS applies disinfectants at more than one point prior to the first customer, it shall determine the CT of each disinfectent sequence before or at the first customer to determine the total percent inactivation or "total inactivation ratio". In determining the total inactivation ratio, the PWS shall determine the RDC of each disinfection sequence and corresponding contact time before any subsequent disinfection application point(s). (See CT99.9)

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"CT99.9" is the CT value required for 99.9 percent (3-log) inactivation of Giardia lamblia cysts. CT99.9 for a variety of disinfectants and conditions appear in Tables 1.1-1.6, 2.1 and 3.1 of Appendix B. (See "Inactivation Ratio".)

BOARD NOTE: Derived from the definition of CT in 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Community Water Supply" ("CWS") is a type of "public water supply", as defined below. A "non-CWS" is a type of public water supply which is not a CWS.

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

A precoat cake of diatomaceous earth filter media is deposited

on a support membrance (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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Disinfectant contact time" ("T" in CT calculations) means the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement to a point before or at the point where RDC ("C") is measured. Where only one "C" 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 where RDC ("C") is measured. Where more than one "C" is measured, "T" is (a) for the first measurement of "C", 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 "C" is measured and (b) for subsequent measurements of "C", the time in minutes that it takes for water to move from the previous "C" measurement point to the "C" measurement point for which the particular "T" is being calculated. Disinfectant contact time 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. Disinfectant contact time within mixing basins and storage reservoirs must be determined by tracer studies or an equivalent demonstration.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

"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).

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

"GC/MS" means GC followed by mass spectrometry.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Groundwater under the direct influence of surface water" is as determined in Section 611.128(a).

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Groundwater Supply Survey" means groundwater supply survey.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

"Inactivation Ratio" (Ai) means:

Ai = CTcalc/CT99.9

The sum of the inactivation ratios, or "total inactivation ratio" (B) is calculated by adding together the inactivation ratio for each disinfection sequence:

B = SUM(Ai)

A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3-log inactivation of Giardia lamblia cysts.

BOARD NOTE: Derived from the definition of "CT" in 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Man-made beta particle and photon emitters" means all radionuclides emitting beta particles and/or photons listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Maximum contaminant level" ("MCL") means the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of a PWS, except in the case of turbidity where the maximum permissible level is measured at the point of entry to the distribution system. Contaminants added to the water under circumstances controlled by the user, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Maximum contaminant level goal" ("MCLG" or "MCL goal") 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 includes an adequate margin of safety. MCL goals are nonenforceable health goals.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Maximum Total Trihalomethane Potential (MTP)" means the maximum concentration of total THMs produced in a given water containing a disinfectant residual after 7 days at a temperature of 25 deg. C or above.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

"Non-transient non-community water system" ("NTNCWS") means a PWS that is not a CWS and that regularly serves at least 25 of the same persons over 6 months per year.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

"NPDWR" means "national primary drinking water regulation".

"NTU" or "TU" means "turbidity units".

"P-A Coliform Test" means "Presence-Absence Coliform Test".

"Performance evaluation 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. The true value of the concentration of the reference material is unknown to the laboratory at the time of the analysis.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Person" means an individual, corporation, company, association, partnership, State, municipality or Federal agency.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Picocurie (pCi)" means the quantity of radioactive material producing 2.22 nuclear transformations per minute.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Point of disinfectant application" is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Point-of-entry treatment device" 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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

"Public water system" ("PWS") means a system for the provision to the public of piped water for human consumption, if such system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least 60 days out of the year. Such term includes:

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 which are used primarily in connection with such system.

A PWS is either a "CWS" or a "nonCWS."

"CWS" means a PWS which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

"Non-CWS" means a PWS that is not a CWS.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Residual disinfectant concentration" ("RDC" or "C" in CT calculations) means the concentration of disinfectant measured in mg/L in a representative sample of water.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Sanitary survey" means an onsite review of the water source, facilities, equipment, operation and maintenance of a PWS for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

"Supplier of water" means any person who owns or operates a PWS.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27562 June 29, 1989.

"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.

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

"Total trihalomethanes" (TTHM) means the sum of the concentration in

milligrams per liter of trihalomethanes, rounded to two significant figures.

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

Trichloromethane (chloroform),

Dibromochloromethane,

Bromodichloromethane and

Tribromomethane (bromoform)

BOARD NOTE: Derived from 40 CFR 141.2 (1987).

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

"VOC" means "volatile organic compound".

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

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

BOARD NOTE: Derived from 40 CFR 141.2 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

"Wellhead Protection Program" means a wellhead protection program developed under Section 1428 of the SDWA. See 35 Ill. Adm. Code 615 through 617.

BOARD NOTE: Derived from 40 CFR 141.71(b) (1987), adopted at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.102 Incorporations by Reference

a) Abbreviations. The following abbreviated names are used for materials incorporated by reference:

"ASTM" means American Society for Testing and Materials

"Indigo Method" is as described in "Determination of Ozone in Water by the Indigo Method", available from Ozone Science and Engineering.

"Inductively Coupled Plasma Method" means "Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis in Water and Wastes -- Method 200.7", available from USEPA.

"Inorganic Methods" means "Methods for Chemical Analysis of Water and Wastes", available from NTIS

"Microbiological Methods" means "Microbiological Methods for Monitoring the Environment, Water and Wastes", available from NTIS.

"Minimal Medium ONPG-MUG Method" is as set forth in "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and Escherichia Coli from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method", available from the American Water Works Association Research Foundation.

"NTIS" means "National Technical Information Service".

"Organic Methods" means "Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water", available from USEPA.

"Pesticide Methods" means "Methods for Organochlorine Pesticides and Chloro-phenoxy Acid Herbicides in Drinking Water and Raw Source Water", available from USEPA.

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

"SPE Test Method" means "Solid Phase Extraction Test Method", available from J.T. Baker Chemical Company

"Standard Methods", means "Standard Methods for the Examination of Water and Wastewater", available from the American Public Health Association.

"Technicon Method" means "Fluoride in Water and Wastewater", available from Technicon.

"USGS Method" means "United States Geological Survey Method"

b) The Board incorporates the following publications by reference:

American Public Health Association et al., 1015 Fifteenth Street, N.W., Washington, D.C. 20005

Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989

ASTM. American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103

ASTM Method D858-88, "Standard Test Methods for Manganese in Water", approved August 19, 1988.

ASTM Method D1067-88, "Standard Test Methods for Acidity or Alkalinity of Water", approved August 19, 1988.

ASTM Method D1068-88, "Standard Test Methods for Iron in Water", approved August 19, 1988.

ASTM Method D1126-86, "Standard Test Method for Hardness in Water, approved August 29, 1988.

ASTM Method D1179-88, "Standard Test Methods for Fluoride in Water", approved August 19, 1988.

ASTM Method D1293-84, "Standard Test Methods for pH of Water", approved October 26, 1984.

ASTM Method D1428-82, "Standard Test Methods for Sodium and Potassium in Water and Water-Formed Deposits by Flame Photometry", approved October 29, 1982.

ASTM Method D1687-86, "Standard Test Methods for Chromium in Water", approved April 25, 1986

ASTM Method D1688-88, "Standard Test Methods for Copper in Water", approved August 19, 1988.

ASTM Method D1691-88, "Standard Test Methods for Zinc in Water", approved August 19, 1988.

ASTM Method D2036-87, "Standard Test Method for Cyanides in Water", approved May 29, 1987.

ASTM Method D2459-72, "Standard Test Method for Gamma Spectrometry in Water," 1975, reapproved 1981, discontinued 1988.

ASTM Method D2907-83, "Standard Test Methods for Microquantities of Uranium in Water by Fluorometry", approved May 27, 1983.

ASTM Method D2972-88, "Standard Test Methods for Arsenic in Water", approved June 24, 1988.

ASTM Method D3086-85, "Standard Test Methods for Organochlorine Pesticides In Water", November 29, 1985.

ASTM Method D3223-86, "Standard Test Method for Total Mercury in Water", approved February 28, 1986.

ASTM Method D3478-85, "Standard Test Method for Chlorinated Phenoxy Acid Herbicides in Water", approved November 29,

1985.

ASTM Method D3557-84, "Standard Test Methods for Cadmium in Water", approved January 27, 1984, reapproved 1988.

ASTM Method D3559-85, "Standard Test Methods for Lead in Water", approved September 27, 1985.

ASTM Method D3859-88, "Standard Test Methods for Selenium in Water", approved June 24, 1988.

ASTM Method D3867-85, "Standard Test Methods for Nitrite-Nitrate in Water", approved August 30, 1985.

AWWA. American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235:

ANSI/AWWA C400-80, "AWWA Standard for Asbestos-Cement Distribution Pipe, 4 in. through 16 in. (100mm through 400mm) NPS, for Water and Other Liquids", approved June 15, 1980; and, Erratum, April, 1981.

American Waterworks Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235

"National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and Escherichia Coli from Drinking Water: Comparison with Presence-Absence Techniques", (Edberg et al.) Applied and Environmental Microbiology, Volume 55, pp. 1003 - 1008, April, 1989.

Minimal Medium ONPG-MUG Method: "National Field Evaluation of a Defined Substrate Method for the Simultaneous Detection of Total Coliforms and Escherichia Coli from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method", (Edberg et al.) Applied and Environmental Microbiology, Volume 54, pp. 1595 - 1601, June 1988, as amended under Erratum, Applied and Environmental Microbiology, Volume 54, p. 3197, December, 1988.

Amco Standards International, Inc., 230 Polaris Avenue, No. C, Mountain View, CA 94403:

Amco-AEPA-1 polymer

ERDA Health and Safety Laboratory, New York, NY

HASL Procedure Manual, HASL 300, 1973

J. T. Baker Chemical Company, 22 Red School Lane, Phillipsburg, NJ 08865

Solid Phase Extract (SPE) Test Method Number SPE-550

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4600.

"Methods of for Chemical Analysis of Water and Wastes", J. Kopp and D. McGee, Third Edition, March, 1979. EPA-600/4-79-020, Doc. No. PB84-128677

"Microbiological Methods for Monitoring the Environment: Water and Wastes", R. Bodner and J. Winter, 1978. EPA-600/8-78-017

Ozone Science and Engineering, Pergamon Press Ltd., Fairview Park, Elmsford, NY 10523

Indigo Method: "Determination of Ozone in Water by the Indigo Method" (Bader and Hoigne),

United States Department of Commerce

"Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure", NBS Handbook 69, as amended August, 1963

United States Environmental Protection Agency, (202) 382-4359

"The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method", Method 501.1. See 40 CFR 141, Subpart C, Appendix C.

"The Analysis of Trihalomethanes in Drinking Water by Liquid/Liguid Extraction," Method 501.2 See 40 CFR 141, Subpart C, Appendix C.

"Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis in Water and Wastes -- Method 200.7, with Appendix to Method 200.7" entitled, "Inductively Coupled Plasma-Atomic Emission Analysis of Drinking Water", March 1987. See 40 CFR 136, Appendix C.

"Interim Radiochemical Methodology for Drinking Water", EPA-600/4-75-008

"Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water", September, 1986

"Methods for Organochlorine Pesticides and Chloro-phenoxy Acid Herbicides in Drinking Water and Raw Source Water"

"Methods of for Chemical Analysis of Water and Wastes". See NTIS

Microbiological Methods for Monitoring the Environment, Water and Wastes". See NTIS

"Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions", H.L. Krieger and S. Gold, EPA-R4-73-014, May, 1973.

United States Environmental Protection Agency, 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", Draft, March 31, 1989

USGS. United States Geological Survey.

Techniques of Water Resources Investigation of the United States Geological Survey,

Chapter A-1, "Methods for Determination of Inorganic substances in Water and Fluvial Sediments", Book 5, 1979

Chapter A-3, "Gas Chromatographic Methods for Analysis of Organic Substances in Water," Book 5, 1971

Technicon Industrial Systems, Tarrytown, NY 10591

"Fluoride in Water and Wastewater", Industrial Method #129-71W, December, 1972

"Fluoride in Water and Wastewater", #380-75WE, February, 1976

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

40 CFR 136, Appendix B and C (1989)

40 CFR 141, Subpart C, Appendix C (1989).

d) This Part incorporates no future amendments or editions.

Section 611.108 Delegation to Local Government

The Agency may delegate portions of its inspection, investigating and enforcement functions to units of local government pursuant to Section 4(r) of the Act.

Section 611.109 Enforcement

a) Any person may file an enforcement action pursuant to Title VIII of the Act.

b) The results of monitoring required under this Part may be used in an enforcement action.

BOARD NOTE: Derived from 40 CFR 141.22(e), as amended at 54 Fed. Reg. 27526, June 29, 1989, and from 40 CFR 141.23(e)(4), as amended at 53 Fed. Reg. 5146, February 19, 1988.

Section 611.110 Coverage

This Part applies to each PWS, unless the PWS meets all of the following conditions:

a) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

b) Obtains all of its water from, but is not owned or operated by, a PWS to which such regulations apply;

c) Does not sell water to any person; and

d) Is not a carrier which conveys passengers in interstate commerce.

BOARD NOTE: Derived from 40 CFR 141.3 (1987).

Section 611.111 Section 1415 Variances

This Section is intended as a State equivalent of Section 1415(a)(1)(A) of the SDWA.

a) The Board may grant a PWS a variance from a NPDWR in this Part.

1) The PWS shall file a variance petition pursuant to 35 Ill. Adm. Code 104, except as modified or supplemented by this Section.

2) The Board may grant a variance from the additional State requirements in this Part without following this Section.

b) As part of the showing of arbitrary or unreasonable hardship, the PWS shall demonstrate that:

1) Because of characteristics of the raw water sources which are reasonably available to the systems, the PWS cannot meet the MCL or other requirement; and

2) The system has applied BAT as identified in this Part. BAT may vary depending on:

A) The number of persons served by the system;

B) Physical conditions related to engineering feasibility; and

C) Costs of compliance; and

3) The variance will not result in an unreasonable risk to health.

c) The Board will prescribe a schedule for:

1) Compliance, including increments of progress, by the PWS, with each MCL or other requirement with respect to which the variance was granted, and

2) Implementation by the PWS of each additional control measure for each MCL or other requirement, during the period ending on the date compliance with such requirement is required.

d) A schedule of compliance will require compliance with each MCL or other requirement with respect to which the variance was granted as expeditiously as practicable.

e) The Board will provide notice and oppurtunity for a public hearing as provided in 35 Ill. Adm. Code 104.

BOARD NOTE: Derived from Section 1415(a)(1)(A) of the SDWA.

f) The Board will not grant a variance from the MCL for total coliforms or from any of the treatment technique requirements of Subpart B.

BOARD NOTE: Derived from 40 CFR 141.4 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.112 Section 1416 Variances

This Section is intended as a State equivalent of Section 1416 of the SDWA.

a) The Board may grant a PWS a variance from any requirement respecting an MCL or treatment technique requirement of an NPDWR in this Part.

1) The PWS shall file a variance petition pursuant to 35 Ill. Adm. Code 104, except as modified or supplemented by this Section.

2) The Board may grant a variance from the additional State requirements in this Part without following this Section.

b) As part of the showing of arbitrary or unreasonable hardship, the PWS shall demonstrate that:

1) Due to compelling factors (which may include economic factors), the PWS is unable to comply with the MCL or treatment technique requirement;

2) The PWS was:

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; and

3) The variance will not result in an unreasonable risk to health.

c) The Board will prescribe a schedule for:

1) Compliance, including increments of progress, by the PWS, with each MCL and treatment technique requirement with respect to which the variance was granted, and

2) Implementation by the PWS of each additional control measure for each contaminant, subject to the MCL or treatment technique requirement, during the period ending on the date compliance with such requirement is required.

d) A schedule of compliance will require compliance with each MCL or other requirement with respect to which the variance was granted as expeditiously as practicable; but no schedule shall extend more than 12 months after the date of the variance, except as follows:

1) The Board may extend the date for a period not to exceed three years beyond the date of the variance if the PWS establishes: that it is taking all practicable steps to meet the standard; and:

A) The PWS cannot meet the standard without capital improvements which cannot be completed within 12 months;

B) In the case of a PWS which 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; and

2) In the case of a PWS with 500 or fewer service connections, and which needs financial assistance for the necessary improvements, a variance under subsections (d)(1)(A) or (B) may be renewed for one or more additional two year periods if the PWS establishes that it is taking all practicable steps to meet the final date for compliance.

e) The Board will provide notice and opportunity for a public hearing as provided in 35 Ill. Adm. Code 104.

f) The Agency shall promptly send USEPA the Opinion and Order of the Board granting a variance pursuant to this Section. The Board may reconsider and modify a grant of variance, or variance conditions, if USEPA notifies the Board of a finding pursuant to Section 1416 of the SDWA.

BOARD NOTE: Derived from Section 1416 of the SDWA.

g) The Board will not grant a variance from the MCL for total coliforms or from any of the treatment technique requirements of Subpart B.

BOARD NOTE: Derived from 40 CFR 141.4 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.113 Alternative Treatment Techniques

This Section is intended to be equivalent to Section 1415(a)(3) of the SDWA.

a) Pursuant to this Section, the Board may grant an adjusted standard from a treatment technique requirement.

b) The PWS seeking an adjusted standard shall file a petition pursuant to 35 Ill. Adm. Code 106.

c) As justification the PWS shall demonstrate that an alternative treatment technique is at least as effective in lowering the level of the contaminant with respect to which the treatment technique requirement was prescribed.

d) As a condition of any adjusted standard, the Board will require the use of the alternative treatment technique.

BOARD NOTE: Derived from Section 1415(a)(3) of the SDWA.

Section 611.114 Siting requirements

Before a person enters into a financial commitment for or initiates construction of a new PWS or increases the capacity of an existing PWS, the person shall obtain a construction permit pursuant to 35 Ill. Adm. Code 602.101 and, to the extent practicable, avoid locating part or all of the new or expanded facility at a site which:

a) Is subject to a significant risk from earthquakes, floods, fires or other disasters which could cause a breakdown of the PWS or a portion of the PWS; or

b) Except for intake structures, is within the floodplain of a 100-year flood.

BOARD NOTE: Derived from 40 CFR 141.5 (1987).

Section 611.120 Effective dates

Except as otherwise provided, this Part becomes effective when filed.

BOARD NOTE: Derived from 40 CFR 141.60 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

Section 611.124 Cross Connections

a) No person shall cause or allow a physical connection between the distribution system and any other water not of equal or better bacteriological and chemical quality, except as provided in subsection (d).

b) No person shall cause or allow an arrangement or connection by which an unsafe substance may enter the distribution system.

c) Control of all cross connections to the distribution system is the responsibility of the PWS.

1) If a privately owned water supply meets the applicable criteria, it may be connected to a PWS upon approval by the PWS and by the Agency.

2) Where such connections are made, it is the responsibility of the PWS to assure submission from such privately owned water supply samples and operating reports required by this Part as applicable to the cross-connected source.

d) The Agency may, by permit condition, control unsafe cross connections.

BOARD NOTE: This is an additional State requirement.

Section 611.125 Fluoridation Requirement

All supplies which are required to add fluoride to the water shall maintain a fluoride ion concentration reported as F of 0.9 to 1.2 mg/l in its distribution system, as required by Section 7(a) of "An Act to provide for safeguarding the public health by vesting certain measures of control and supervision in the Department of Public Health over Public Water Supplies in the State", Ill. Rev. Stat. 1987, ch. 111 1/2, par. 121(g)(1).

BOARD NOTE: This is an additional State requirement.

Section 611.126 Prohibition on Use of Lead

a) In general

1) Prohibition. Any pipe, solder or flux, shall be lead free, as defined by subsection (d), if it is used after June 19, 1986, in the installation or repair of:

A) Any PWS, or

B) Any plumbing in a residential or nonresidential facility providing water for human consumption which is connected to

a PWS. This subsection does not apply to leaded joints necessary for the repair of cast iron pipes.

2) Each PWS shall identify and provide notice to persons that may be affected by lead contamination of their drinking water where such contamination results from either or both of the following:

A) The lead content in the construction materials of the PWS distribution system; or

B) Corrosivity of the water supply sufficient to cause leaching of lead.

C) Notice must be provided notwithstanding the absence of a violation of any NPDWR. The manner and form of notice are specified in Section 611.861 et seq.

d) Definition of lead free. For purposes of this Section, the term "lead free":

1) When used with respect to solders and flux, refers to solders and flux containing not more than 0.2 percent lead, and

2) When used with respect to pipes and pipe fittings, refers to pipes and pipe fittings containing not more than 8.0 percent lead.

BOARD NOTE: Derived from 40 CFR 141.43 (1987).

SUBPART B: FILTRATION AND DISINFECTION

Section 611.128 Agency Determinations

a) The Agency shall determine that filtration is required unless the PWS meets the following criteria:

1) Source water quality criteria:

A) Coliforms, see Section 611.131(a)

B) Turbidity, see Section 611.131(b)

2) Site specfic criteria:

A) Disinfection, see Section 611.141(b)

B) Watershed control, see Section 611.132(b)

C) On-site inspection, see Section 611.132(c)

D) Absence of waterborne disease outbreaks, see Section 611.132(d)

E) Total coliform MCL, see Sections 611.132(e) and 611.360.

F) TTHMs MCL, see Section 611.310.

BOARD NOTE: Derived from 40 CFR 141.71, adopted at 54 Fed. Reg. 54 Fed. Reg. 27526, June 29, 1989, and from the Preamble at 54 Fed. Reg. 27505, June 29, 1989.

b) The Agency shall determine with information provided by the PWS whether a PWS uses "groundwater under the direct influence of surface water" on an individual basis. The Agency shall determine that a groundwater source is under the direct influence of surface water based upon:

1) Physical characteristics of the source: whether the source is obviously a surface water source, such as a lake or stream. Other sources which may be subject to influence from surface waters include: springs, infiltration galleries, wells or other collectors in subsurface aquifers.

2) Well construction characteristics and geology with field evaluation.

A) The Agency may use the wellhead protection program's requirements, which include delineation of wellhead protection areas, assessment of sources of contamination and implementation of management control systems, to determine if the wellhead is under the influence of surface water.

B) Wells less than or equal to 50 feet in depth are likely to be under the influence of surface water.

C) Wells greater than 50 feet in depth are likely to be under the influence of surface water, unless they include:

i) A surface sanitary seal using bentonite clay, concrete similar material.

ii) A well casing that penetrates consolidated (slowly permeable) material.

iii) A well casing that is only perforated or screened below consolidated (slowly permeable) material.

D) A source which is less than 200 feet from any surface water is likely to be under the influence of surface water

3) Any structural modifications to prevent the direct influence of surface water and eliminate the potential for Giardia lamblia cyst contamination.

4) A source water quality records should indicate:

A) No record of total coliform or fecal coliform contamination in untreated samples collected over the past three years.

B) No history of turbidity problems associated with the source.

C) No history of known or suspected outbreak of Giardia lamblia or other pathogenic organism associated with surface water (e.g. cryptosporidium), which has been attributed to that source.

5) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity or pH.

A) A variation in turbity of 0.5 NTU over one year is indicative of surface influence.

B) A variation in temperature of 2 Celsius degrees over one year is indicative of surface influence.

6) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity or pH which closely correlate to climatological or surface water conditions are indicative of surface water influence.

A) No evidence of particulate matter associated with the surface water.

B) No turbidity or temperature data which correlates to that of a nearby water source.

7) Particulate analysis: Significant occurance of insects or other macroorganisms, algae or large diameter pathogens such as Giardia lamblia is indicative of surface influence.

A) "Large diameter" particulates are those over 7 micrometers.

B) Particulates must be measured as specified in Standard Methods, Method 912K, incorporated by reference in Section 611.102.

8) The potential for contamination by small-diameter pathogens, such as bacteria or viruses, does not alone render the source "under the direct influence of surface water".

BOARD NOTE: Derived from the definition of "groundwater under the direct influence of surface water" in 40 CFR 141.2, adopted at 54 Fed. Reg. 27526, June 29, 1989; from the Preamble at 54 Fed. Reg. 27489, June 29, 1989; and from the USEPA Guidance Manual for Compliance with Filtration and Disinfection Requirements, incorporated by reference in Section 611.102.

c) The Agency shall determine that a system has no means for having a

sample analyzed for HPC if:

1) There is no certified laboratory which can analyze the sample within the time and temperatures specified in Standard Methods, Method 907A, incorporated by reference in Section 611.102, considering:

   A) Transportation time to the nearest laboratory pursuant to Section 611.490; and

   B) Based on the size of the PWS, whether it should acquire in-house laboratory capacity to measure HPC; and

2) The PWS is providing adequate disinfection in the distribution system, considering:

   A) Other measurements which show the presence of RDC in the distribution system;

   B) The size of the distribution system;

   C) The adequacy of the PWS's cross connection control program.

   BOARD NOTE: Derived from 40 CFR 141.72(a)(4)(ii), adopted at 54 Fed. Reg. 54 Fed. Reg. 27526, June 29, 1989, and from the Preamble at 54 Fed. Reg. 27495, June 29, 1989.

d) The Agency shall notify each PWS in writing of the date on which any demonstrations pursuant to the Section are required.

   1) The Agency shall require demonstrations at times which meet the USEPA requirements for that type of demonstration, allowing sufficient time for the PWS to collect the necessary information.

   2) The demonstration date is a permit condition which may be appealed to the Board.

e) The Agency shall make all determinations in writing. The determination is a condition of the PWS permit, and may be appealed as a modification of that permit.

Section 611.129 General Requirements

a) The requirements of this Subpart constitute national primary drinking water regulations. This Subpart establishes criteria under which filtration is required as a treatment technique for PWSs supplied by a surface water source and PWSs supplied by a groundwater source under the direct influence of surface water. In addition, these regulations establish treatment technique requirements in lieu of MCLs for the following contaminants: Giardia lamblia, viruses, HPC bacteria, Legionella and turbidity. Each PWS with a surface water source or a groundwater source under the direct influence of surface water shall provide treatment of that source water that complies with

these treatment technique requirements. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

1) At least 99.9 percent (3-log) removal or inactivation of Giardia lamblia cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and

2) At least 99.99 percent (4-log) removal or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

b) A PWS using a surface water source or a groundwater source under the direct influence of surface water is considered to be in compliance with the requirements of subsection (a) if:

1) It meets the requirements for avoiding filtration in Section 611.130 and the disinfection requirements in Section 611.141; or

2) It meets the filtration requirements in Section 611.130 and the disinfection requirements in Section 611.142

c) Each PWS using a surface water source or a groundwater source under the direct influence of surface water must have a certified operator pursuant to 35 Ill. Adm. Code 603.103.

BOARD NOTE: Derived from 40 CFR 141.70 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.130 Filtration Effective Dates

a) A PWS that uses a surface water source shall meet all of the conditions of Section 611.131 and 611.132, and is subject to Section 611.133, beginning December 30, 1991, unless the Agency has determined that filtration is required.

b) A PWS that uses a groundwater source under the direct influence of surface water shall meet all of the conditions of Section 611.131 and 611.132, and is subject to Section 611.133, beginning 18 months after the Agency determines that it is under the direct influence of surface water, or December 30, 1991, whichever is later, unless the Agency has determined that filtration is required.

c) If the Agency determines, before December 30, 1991, that filtration is required, the system shall have installed filtration and shall meet the criteria for filtered systems specified in Sections Section 611.142 and Section 611.150 by June 29, 1993.

d) Within 18 months of the failure of a system using surface water or a groundwater source under the direct influence of surface water to meet any one of the requirements of Section 611.131 and 611.132, or after June 29, 1993, whichever is later, the system shall have

installed filtration and meet the criteria for filtered systems specified in Sections 611.142 and 611.150.

BOARD NOTE: Derived from 40 CFR 141.71 preamble (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.131 Source Water Quality Conditions

The Agency shall consider the following source water quality conditions in determining whether to require filtration pursuant to Section 611.128(a):

a) The fecal coliform concentration must be equal to or less than 20/100 ml, or the total coliform concentration must be equal to or less than 100/100 ml (measured as specified in Section 611.531(a) or (b) and 611.532(a)) in representative samples of the source water immediately prior to the first or only point of disinfectant application in at least 90 percent of the measurements made for the 6 previous months that the system served water to the public on an ongoing basis. If a system measures both fecal and total coliforms, the fecal coliform criterion, but not the total coliform criterion, in this subsection, must be met.

b) The turbidity level cannot exceed 5 NTU (measured as specified in Section 611.531(d) and 611.532(b) in representative samples of the source water immediately prior to the first or only point of disinfectant application unless:

1) The Agency determines that any such event was caused by circumstances that were unusual and unpredictable; and

2) As a result of any such event there have not been more than two events in the past 12 months the system served water to the public, or more than five events in the past 120 months the system served water to the public, in which the turbidity level exceeded 5 NTU. An "event" is a series of consecutive days during which at least one turbidity measurement each day exceeds 5 NTU.

BOARD NOTE: Derived from 40 CFR 141.71(a) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

c) Each supply must take its raw water from the best available source which is economically reasonable and technically possible.

BOARD NOTE: This is an additional State requirement.

d) Use of recycled sewage treatment plant effluent on a routine basis shall not be permitted.

BOARD NOTE: This is an additional State requirement.

e) Surface Supply - The quality of surface water at the source shall be adequate to supply the total water demand of a community from that source, as well as a reasonable surplus for anticipated growth.

BOARD NOTE: This is an additional State requirement.

f) Groundwater supply - The quality of ground water from the source of supply shall be adequate to supply the total water demand of that public water supply, as well as a reasonable surplus for anticipated growth, without excessive depletion of the aquifer.

BOARD NOTE: This is an additional State requirement.

g) In determining the adequacy of supply for compliance with this section, each individual water supply shall be considered in relation to the percentage of the total requirements it is expected to provide.

BOARD NOTE: This is an additional State requirement.

Section 611.132 Site-specific Conditions

The Agency shall consider the following site specific criteria in determining whether to require filtration pursuant to Section 611.128(a):

a) Disinfection.

1) The PWS shall meet the requirements of Section 611.141(a) at least 11 of the 12 previous months that the system served water to the public, on an ongoing basis, unless the system fails to meet the requirements during 2 of the 12 previous months that the system served water to the public, and the Agency determines that at least one of these failures was caused by circumstances that were unusual and unpredictable.

2) The PWS shall meet the requirements of Section 611.141(b) at all times the system serves water to the public unless the Agency determines that any such failure was caused by circumstances that were unusual and unpredictable.

3) The PWS shall meet the requirements of Section 611.141(c) at all times the system serves water to the public unless the Agency determines that any such failure was caused by circumstances that were unusual and unpredictable.

4) The PWS shall meet the requirements of Section 611.141(d) on an ongoing basis unless the Agency determines that failure to meet these requirements was not caused by a deficiency in treatment of the source water.

b) Watershed control program. The PWS shall maintain a watershed control program which minimizes the potential for contamination by Giardia lamblia cysts and viruses in the source water. The Agency shall determine whether the watershed control program is adequate to meet this goal. The Agency shall determine the adequacy of a watershed control program based on:

1) The comprehensiveness of the watershed review;

2) The effectiveness of the system's program to monitor and control detrimental activities occurring in the watershed; and

3) The the extent to which the water system has maximized land ownership or controlled land use within the watershed. At a minimum, the watershed control program must:

A) Characterize the watershed hydrology and land ownership;

B) Identify watershed characteristics and activities which may have an adverse effect on source water quality; and

C) Monitor the occurrence of activities which may have an adverse effect on source water quality.

4) The PWS shall demonstrate through ownership and/or written agreements with landowners within the watershed that it can control all human activities which may have an adverse impact on the microbiological quality of the source water. The PWS shall submit an annual report to the Agency that identifies any special concerns about the watersned and how they are being handled; describes activities in the watershed that affect water quality; and projects what adverse activities are expected to occur in the future and describes how the PWS expects to address them. For systems using a groundwater source under the direct influence of surface water, an approved wellhead protection program may be used, if appropriate, to meet these requirements.

c) On-site inspection. PWS shall be subject to an annual on-site inspection to assess the watershed control program and disinfection treatment process. Either the Agency or a unit of local government delegated pursuant to Section 611.108 shall conduct the inspection. A report of the on-site inspection summarizing all findings must be prepared every year. The on-site inspection must demonstrate that the watershed control program and disinfection treatment process are adequately designed and maintained. The on-site inspection must include:

1) A review of the effectiveness of the watershed control program;

2) A review of the physical condition of the source intake and how well it is protected;

3) A review of the system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

4) An inspection of the disinfection equipment for physical deterioration;

5) A review of operating procedures;

6) A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

7) Identification of any improvements which are needed in the equipment, system maintenance and operation or dataytem and who have a sound understanding of public health principles and waterborne diseases. A report of the on-site inspection summarizing all findings must be prepared every year. The on-site inspection must indicate to the Agency's satisfaction that the watershed control program and disinfection treatment process are adequately designed and maintained. The on-site inspection must include:

A) A review of the effectiveness of the watershed control program;

B) A review of the physical condition of the source intake and how well it is protected;

C) A review of the system's equipment maintenance program to ensure there is low probability for failure of the disinfection process;

D) An inspection of the disinfection equipment for physical deterioration;

E) A review of operating procedures;

F) A review of data records to ensure that all required tests are being conducted and recorded and disinfection is effectively practiced; and

G) Identification of any improvements which are needed in the equipment, system maintenance and operation or data collection.

d) Absence of waterborne disease outbreaks. The PWS shall not have been identified as a source of a waterborne disease outbreak, or if it has been so identified, the system must have been modified sufficiently to prevent another such occurrence.

e) Total Coliform MCL. The PWS shall comply with the MCL for total coliforms in Section 611.360 at least 11 months of the 12 previous months that the system served water to the public, on an ongoing basis, unless the Agency determines that failure to meet this requirement was not caused by a deficiency in treatment of the source water.

f) TTHM MCL. The PWS shall comply with the MCL for TTHM in Section 611.310.

BOARD NOTE: Derived from 40 CFR 141.71(b) (1987), as amended at 54

Fed. Reg. 27526, June 29, 1989.

Section 611.133 Treatment Technique Violations

a) A PWS is in violation of a treatment technique requirement if:

1) Filtration is required because:

A) The PWS fails to meet any one of the criteria in Section 611.131 and 611.132; or

B) The Agency has determined, pursuant to Section 611.128(a), that filtration is required; and

2) The PWS fails to install filtration by the date specified in Section 611.130.

b) A PWS which has not installed filtration is in violation of a treatment technique requirement if:

1) The turbidity level (measured as specified in Section 611.531(d) and 611.532(b)) in a representative sample of the source water immediately prior to the first or only point of disinfection application exceeds 5 NTU; or

2) The system is identified as a source of a waterborne disease outbreak.

BOARD NOTE: Derived from 40 CFR 141.71(c) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.140 Disinfection

a) A PWS that uses a surface water source and does not provide filtration treatment shall provide the disinfection treatment specified in Section 611.141 beginning December 30, 1991.

b) A PWS that uses a groundwater source under the influence of surface water and does not provide filtration treatment shall provide disinfection treatment specified in Section 611.141 beginning December 30, 1991, or 18 months after the Agency determines that the groundwater source is under the influence of surface water, whichever is later, unless the Agency has determined that filtration is required.

c) If the Agency determines that filtration is required, the Agency may, by permit condition, require the PWS to comply with interim disinfection requirements before filtration is installed.

d) A system that uses a surface water source that provides filtration treatment shall provide the disinfection treatment specified in Section 611.142 beginning June 29, 1993, or beginning when filtration is installed, whichever is later.

e) A system that uses a groundwater source under the direct influence of surface water and provides filtration treatment shall provide disinfection treatment as specified in Section 611.142 by June 29, 1993 or beginning when filtration is installed, whichever is later.

f) Failure to meet any requirement of the following Sections after the applicable date specified in this Section is a treatment technique violation.

BOARD NOTE: Derived from 40 CFR 141.72 preamble (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

g) All CWSs shall provide disinfection pursuant to Section 611.141 or 611.142, unless the Agency has granted the CWS an exemption pursuant to Section 17.6 of the Act.

BOARD NOTE: This is an additional State requirement.

Section 611.141 Unfiltered PWSs

Each PWS that does not provide filtration treatment shall provide disinfection treatment as follows:

a) The disinfection treatment must be sufficient to ensure at least 99.9 percent (3-log) inactivation fo Giardia lamblia cysts and 99.99 percent (4-log) inactivation of viruses, every day the system serves water to the public, except any one day each month. Each day a system serves water to the public, the PWS shall calculate the CT value(s) from the system's treatment parameters using the procedure specified in Section 611.532(c) and determine whether this value(s) is sufficient to achieve the specified inactivation rates for Giardia lamblia cysts and viruses.

1) If a system uses a disinfectant other than chlorine, the system may demonstrate to the Agency, through the use of an Agency-approved protocol for on-site disinfection challenge studies or other information, that CT99.9 values other than those specified in Appendix B, Tables 2.1 and 3.1 or other operational parameters are adequate to demonstrate that the system is achieving minimum inactivation rates required by this subsection.

2) The demonstration must be made by way of permit application.

b) The disinfection system must have either:

1) Redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system; or

2) Automatic shut-off of delivery of water to the distribution system whenever there is less than 0.2 mg/L of RDC in the water. If the Agency determines that automatic shut-off would

cause unreasonable risk to health or interfere with fire protection, the system shall comply with subsection (b)(1).

c) The RDC in the water entering the distribution system, measured as specified in Section 611.531(e) and 611.532(e), cannot be less than 0.2 mg/L for more than 4 hours.

d) RDC in the distribution system.

1) The RDC in the distribution system, measured as total chlorine, combined chlorine or chlorine dioxide, as specified in Section Section 611.531(e) and 611.532(e), cannot be undetectable in more than 5 percent of the samples each month for any two consecutive months that the system serves water to the public. Water in the distribution system with HPC less than or equal to 500/ml, measured as specified in Section 611.531(c), is deemed to have a detectable RDC for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 percent in one month, for any two consecutive months.

$$V = 100(c + d + e) / (a + b)$$

where:

a = Number of instances where the RDC is measured.

b = Number of instances where the RDC is not measured, but HPC is measured.

c = Number of instances where the RDC is measured but not detected and no HPC is measured.

d = Number of instances where the RDC is measured but not detected, and where the HPC is greater than 500/ml. And,

e = Number of instances where the RDC is not measured and HPC is greater than 500/ml.

2) Subsection (d)(1) does not apply if the Agency determines, pursuant to Section 611.128(c), that a PWS has no means for having a sample analyzed for HPC.

BOARD NOTE: Derived from 40 CFR 141.72(a) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.142 Filtered PWSs

Each PWS that provides filtration treatment shall provide disinfection treatment as follows:

a) The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9

percent (3-log) inactivation and/or removal of Giardia lamblia cysts and at least 99.99 percent (4-log) inactivation and/of removal of viruses.

b) The RDC in the water entering the distribution system, measured as specified in Section 611.531(e) and 611.533(b), cannot be less than 0.2 mg/L for more than 4 hours.

c) RDC in the distribution system.

1) The RDC in the distribution system, measured as total chlorine, combined chlorine or chlorine dioxide, as specified in Section 611.531(e) and 611.533(c), cannot be undetectable in more than 5 percent of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with HPC less than or equal to 500/ml, measured as specified in Section 611.531(c), is deemed to have a detectable RDC for purposes of determining compliance with this requirement. Thus, the value "V" in the following formula cannot exceed 5 percent in one month, for any two consecutive months.

$$V = 100(c + d + e) / (a + b)$$

where:

a = Number of instances where the RDC is measured.

b = Number of instances where the RDC is not measured, but HPC is measured.

c = Number of instances where the RDC is measured but not detected and no HPC is measured.

d = Number of instances where the RDC is measured but not detected, and where HPC is greater than 500/ml. And,

e = Number of instances where the RDC is not measured and HPC is greater than 500/ml.

2) Subsection (c)(1) does not apply if the Agency determines, pursuant to Section 611.128(c), that a PWS has no means for having a sample analyzed for HPC.

BOARD NOTE: Derived from 40 CFR 141.72(b) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.150 Filtration

A PWS that uses a surface water source or a groundwater source under the direct influence of surface water, and does not meet all of the criteria in Section 611.131 and 611.132 for avoiding filtration, shall provide treatment consisting of both disinfection, as specified in Section 611.142, and filtration treatment which complies with the requirements of subsection (a),

(b), (c), (d) or (e) by June 29, 1993, or within 18 months of the failure to meet any one of the criteria for avoiding filtration in Section 611.131 and 611.132, whichever is later. Failure to meet any requirement after the date specified in this introductory paragraph is a treatment technique violation.

a) Conventional filtration treatment or direct filtration.

1) For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 NTU in at least 95 percent of the measurements taken each month, except that, if the Agency determines, by permit condition, that the system is capable of achieving at least 99.9 percent removal or inactivation of Giardia lamblia cysts at some turbidity level higher than 0.5 NTU in at least 95 percent of the measurements taken each month, the Agency shall substitute this higher turbidity limit for that system. However, in no case shall the Agency approve a turbidity limit that allows more than 1 NTU in more than 5 percent of the samples taken each month.

2) The turbidity level of representative samples of a system's water must at no time exceed 5 NTU.

b) Slow sand filtration.

1) For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, except that if the Agency determines, by permit condition, that there is no significant interference with with disinfection at a higher level, the Agency shall substitute the higher turbidity limit for that system.

2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU.

c) Diatomaceous earth filtration.

1) For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month.

2) The turbidity level of representative samples of a system's filtered water must at no time exceed NTU.

d) Other filtration technologies. A PWS may use a filtration technology not listed in subsections (a) through (c) if it demonstrates, by permit application, to the Agency, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of Section 611.142, consistently achieves 99.9 percent removal or inactivation of Giardia lamblia cysts and 99.99 percent removal or inactivation of

viruses. For a system that makes this demonstration, the requirements of subsection (b) apply.

e) Turbidity is measured as specified in Sections 611.531(d) and 611.533(a).

BOARD NOTE: Derived from 40 CFR 141.73 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.161 Unfiltered PWSs: Reporting and Recordkeeping

A PWS that uses a surface water source and does not provide filtration treatment shall report monthly to the Agency the information specified in this Section beginning December 31, 1990, unless the Agency has determined that filtration is required, in which case the Agency shall, by permit condition, specify alternative reporting requirements, as appropriate, until filtration is in place. A PWS that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment shall report monthly to the Agency the information specified in this Section beginning December 31, 1990, or 6 months after the Agency determines that the groundwater source is under the direct influence of surface water, whichever is later, unless the Agency has determined that filtration is required, in which case the Agency shall, by permit condition, specify alternative reporting requirements, as appropriate, until filtration is in place.

a) Source water quality information must be reported to the Agency within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:

1) The cumulative number of months for which results are reported.

2) The number of fecal or total coliform samples, whichever are analyzed during the month (if a system monitors for both, only fecal coliforms must be reported), the dates of sample collection, and the dates when the turbidity level exceeded 1 NTU.

3) The number of samples during the month that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed.

4) The cumulative number of fecal or total coliform samples, whichever are analyzed, during the previous six months the system served water to the public.

5) The cumulative number of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous six months the system served water to the public.

6) The percentage of samples that had equal to or less than 20/100 ml fecal coliforms or equal to or less than 100/100 ml total coliforms, whichever are analyzed, during the previous six months the system served water to the public.

7) The maximum turbidity level measured during the month, the date(s) of occurrence for any measurement(s) which exceeded 5 NTU and the date(s) the occurrence(s) was reported to the Agency.

8) For the first 12 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after one year of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 12 months the system served water to the public.

9) For the first 120 months of recordkeeping, the dates and cumulative number of events during which the turbidity exceeded 5 NTU, and after 10 years of recordkeeping for turbidity measurements, the dates and cumulative number of events during which the turbidity exceeded 5 NTU in the previous 120 months the system served water to the public.

b) Disinfection information specified in Section 611.532 must be reported to the Agency within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:

1) For each day, the lowest measurement of RDC in mg/L in water entering the distribution system.

2) The date and duration of each period when the RDC in water entering the distribution system fell below 0.2 mg/L and when the Agency was notified of the occurrence.

3) The daily RDC(s) (in mg/L) and disinfectant contact time(s) (in minutes) used for calculating the CT value(s).

4) If chlorine is used, the daily measurement(s) of pH of disinfected water following each point of chlorine disinfection.

5) The daily measurement(s) of water temperature in degrees C following each point of disinfection.

6) The daily CTcalc and Ai values for each disinfectant measurement or sequence and the sum of all Ai values (B) before or at the first customer.

7) The daily determination of whether disinfection achieves adequate Giardia cyst and virus inactivation, i.e., whether Ai is at least 1.0 or, where disinfectants other than chlorine are used, other indicator conditions that the Agency, pursuant to Section 611.141(a)(1), determines are appropriate, are met.

8) The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to Section 611.140 et seq.:

A) Number of instances where the RDC is measured;

B) Number of instances where the RDC is not measured but HPC is measured;

C) Number of instances where the RDC is measured but not detected and no HPC is measured;

D) Number of instances where the RDC is detected and where HPC is greater than 500/ml;

E) Number of instances where the RDC is not measured and HPC is greater than 500/ml;

F) For the current and previous month the system served water to the public,the value of "V" in the following formula:

$$V = 100(c + d + e) / (a + b)$$

where:

a =Value in subsection (b)(8)(A).

b =Value in subsection (b)(8)(B).

c =Value in subsection (b)(8)(C).

d =Value in subsection (b)(8)(D). And,

e =Value in subsection (b)(8)(E).

G) The requirements of subsections (b)(8)(A) through (F) do not apply if the Agency determines, pursuant to Section 611.128(c), that a system has no means for having a sample analyzed for HPC.

9) A system need not report the data listed in subsections (b)(1), and (b)(3) through (6), if all data listed in subsections (b)(1) through (b)(8) remain on file at the system, and the Agency determines that:

A) The system has submitted to the Agency all the information required by subsections (b)(1) through (8) for at least 12 months; and

B) The Agency has determined that the system is not required to provide filtration treatment.

c) By October 10 of each year, each system shall provide to the Agency a report which summarizes its compliance with all watershed control program requirements specified in 611.132(b).

d) By October 10 of each year, each system shall provide to the Agency a

report on the on-site inspection conducted during that year pursuant to Section 611.132(c), unless the on-site inspection was conducted by the Agency. If the inspection was conducted by the Agency, the Agency shall provide a copy of its report to the PWS.

e) Reporting health threats.

1) Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, shall report that occurrence to the Agency as soon as possible, but no later than by the end of the next business day.

2) If at any time the turbidity exceeds 5 NTU, the system shall inform the Agency as soon as possible, but no later than the end of the next business day.

3) If at any time the RDC falls below 0.2 mg/L in the water entering the distribution system, the system shall notify the Agency as soon as possible, but no later than by the end of the next business day. The system also shall notify the Agency by the end of the next business day whether or not the RDC was restored to at least 0.2 mg/L within 4 hours.

BOARD NOTE: Derived from 40 CFR 141.75(a) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.162 Filtered PWSs: Reporting and Recordkeeping

A PWS that uses a surface water source or a groundwater source under the direct influence of surface water and provides filtration treatment shall report monthly to the Agency the information specified in this Section beginning June 29, 1993, or when filtration is installed, whichever is later.

a) Turbidity measurements as required by Section 611.533(a) must be reported within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:

1) The total number of filtered water turbidity measurements taken during the month.

2) The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in Section 611.150 for the filtration technology being used.

3) The date and value of any turbidity measurements taken during the month which exceed 5 NTU.

b) Disinfection information specified in Section 611.533 must be reported to the Agency within 10 days after the end of each month the system serves water to the public. Information that must be reported includes:

1) For each day, the lowest measurement of RDC in mg/L in water

entering the distribution system.

2) The date and duration of each period when the RDC in water entering the distribution system fell below 0.2 mg/L and when the Agency was notified of the occurrence.

3) The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to Section 611.140 et seq.:

A) Number of instances where the RDC is measured;

B) Number of instances where the RDC is not measured but HPC is measured;

C) Number of instances where the RDC is measured but not detected and no HPC is measured;

D) Number of instances where no RDC is detected and where HPC is greater than 500/ml;

E) Number of instances where the RDC is not measured and HPC is greater than 500/ml;

F) For the current and previous month the system serves water to the public,the value of "V" in the following formula:

$$V = 100(c + d + e) / (a + b)$$

where:

a =Value in subsection (b)(2)(A).

b =Value in subsection (b)(2)(B).

c =Value in subsection (b)(2)(C).

d =Value in subsection (b)(2)(D). And,

e =Value in subsection (b)(2)(E).

G) The requirements of subsections (b)(8)(A) through (F) do not apply if the Agency determines, pursuant to Section 611.128(c), that a system has no means for having a sample analyzed for HPC.

4) A system need not report the data listed in subsection (b)(1) if all data listed in subsections (b)(1) through (3) remain on file at the system and the Agency determines that the system has submitted all the information required by subsections (b)(1) through (3) for at least 12 months.

c) Reporting health threats.

1) Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, shall report that occurrence to the Agency as soon as possible, but no later than by the end of the next business day.

2) If at any time the turbidity exceeds 5 NTU, the system shall inform the Agency as soon as possible, but no later than the end of the next business day.

3) If at any time the residual falls below 0.2 mg/L in the water entering the distribution system, the system shall notify the Agency as soon as possible, but no later than by the end of the next business day. The system also shall notify the Agency by the end of the next business day whether or not the residual was restored to at least 0.2 mg/L within 4 hours.

BOARD NOTE: Derived from 40 CFR 141.75(b) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.171 Protection during Repair Work

The PWS shall prevent contamination of water at the source or in the distribution system during repair, reconstruction or alteration.

BOARD NOTE: This is an additional State requirement.

Section 611.172 Disinfection following Repair

a) After any portion of the distribution system has been repaired, reconstructed or altered, the PWS shall disinfect the water in that portion before putting it into operation.

b) The disinfection procedure must be approved by permit condition.

BOARD NOTE: This is an additional State requirement.

SUBPART J: USE OF NON-CENTRALIZED TREATMENT DEVICES

Section 611.180 Point-of-Entry Devices

a) PWSs may use point-of-entry devices to comply with MCLs only if they meet the requirements of this Section.

b) It is the responsibility of the PWS to operate and maintain the point-of entry treatment system.

c) The PWS shall develop a monitoring plan before point-of-entry devices are installed for compliance.

1) Point-of-entry devices must provide health protection equivalent to central water treatment. "Equivalent" means that the water would meet all NPDWR and would be of acceptable quality similar to water distributed by a well-operated central treatment plant.

2) In addition to the VOCs, monitoring must include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

3) Use of point-of-entry devices must be approved by permit condition.

d) Effective technology must be properly applied under a plan approved by the Agency and the microbiological safety of the water must be maintained.

1) The Agency shall require adequate certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices.

2) The design and application of the point-of-entry devices must consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. The Agency may require, by permit condition, frequent backwashing, post-contactor disinfection and HPC monitoring to ensure that the microbiological safety of the water is not compromised.

e) All consumers must be protected. Every building connected to the system must have a point-of-entry device installed, maintained and adequately monitored. The Agency must be assured that every building is subject to treatment and monitoring, and that the rights and responsibilities of the PWS customer convey with title upon sale of property.

BOARD NOTE: Derived from 40 CFR 141.100 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987, and at 53 Fed. Reg. 25109, July 1, 1988.

Section 611.190 Use of other Non-centralized Treatment Devices

PWSs shall not use bottled water or point-of-use devices to achieve compliance with an MCL. Bottled water or point-of-use devices may be used on a temporary basis to avoid an unreasonable risk to health.

BOARD NOTE: Derived from 40 CFR 141.101 (1987), as added at 52 Fed. Reg. 25712, July 8, 1987.

SUBPART F: MAXIMUM CONTAMINANT LEVELS (MCL'S)

Section 611.300 Inorganic Chemicals

a) The MCL for nitrate is applicable to both CWSs and non-CWSs except as provided by in subsection (d) . The levels for the other inorganic chemicals apply only to CWSs. Compliance with MCLs for inorganic chemicals is calculated pursuant to Subpart N.

b) The following are the MCL's for inorganic chemicals:

Contaminant	Level, mg/L	Additional State Requirement
Arsenic	0.05	
Barium	1.	
Cadmium	0.010	
Chromium	0.05	
Copper	5.	*
Cyanide	0.2	*
Fluoride	4.0	
Iron	1.0	*
Lead	0.05	
Manganese	0.15	*
Mercury	0.002	
Nitrate(as N)	10.	
Selenium	0.01	
Silver	0.05	
Zinc	5.	*

BOARD NOTE: Derived from 40 CFR 141.11 (1987).

e) The following supplementary condition applies to the concentrations listed in subsection (b): Iron and manganese:

1) CWSs which serve a population of 1000 or less, or 300 service connections or less, are exempt from the standards for iron and manganese.

2) The Agency may, by permit condition, allow iron and manganese in excess of the MCL if sequestration tried on an experimental basis proves to be effective. If sequestration is not effective, positive iron or manganese reduction treatment as applicable must be provided. Experimental use of a sequestering agent may be tried only if approved by permit condition.

BOARD NOTE: This is an additional State requirement.

Section 611.310 Organic Chemicals

The following are the MCLs for organic chemicals. The MCLs for organic chemicals in subsections (a) and (b) apply to all CWSs. Compliance with the MCLs in subsections (a) and (b) is calculated pursuant to Section 611.641 et seq. Compliance with the MCL for TTHM is calculated pursuant to Subpart P.

Contaminant	Level (mg/L)	Additional State Requirement
a) Chlorinated hydrocarbons:		
Aldrin	0.001	*
Chlordane	0.003	*
DDT	0.05	*
Dieldrin	0.001	*
Endrin	0.0002	
Heptachlor	0.0001	*
Heptachlor epoxide	0.0001	*
Lindane	0.004	
Methoxychlor	0.1	
Toxaphene	0.005	
b) Chlorophenoxys:		
2,4-D	0.01	*
2,4,5-TP (Silvex)	0.01	
c) TTHM	0.10	*

BOARD NOTE: Derived from 40 CFR 141.12 (1987).

d) The standard for TTHMs does not apply to supplies serving fewer than 10,000 individuals.

BOARD NOTE: This is an additional State requirement.

Section 611.320 Turbidity

This Section applies to unfiltered systems until December 30, 1991, unless the Agency has determined, pursuant to Section 611.123, prior to that date that filtration is required. This Section applies to unfiltered systems that the Agency has determined, pursuant to Section 611.128, must install filtration, until June 29, 1993, or until filtration is installed, whichever is later. The MCLs for turbidity are applicable to both CWSs and non-CWSs using surface water sources in whole or in part. The MCLs for turbidity in drinking water, measured at a representative entry point(s) to the distribution system, are:

a) One turbidity unit, as determined by a monthly average pursuant to Subpart M, except that five or fewer turbidity units are allowed if the PWS demonstrates, by permit permit application, that the higher turbidity does not do any of the following:

1) Interfere with disinfection;

2) Prevent maintenance of an effective disinfectant agent throughout the distribution system; or

3) Interfere with microbiological determinations.

b) Five turbidity units based on an average for two consecutive days pursuant to Subpart M.

BOARD NOTE: Derived from 40 CFR 141.13 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.330 Radium and Gross Alpha Particle Activity

The following are the MCLs for radium-226, radium-228 and gross alpha particle radioactivity:

a) Combined radium-226 and radium-228 - 5 pCi/L.

b) Gross alpha particle activity (including radium-226 but excluding radon and uranium) - 15 pCi/L.

BOARD NOTE: Derived from 40 CFR 141.15 (1987).

Section 611.331 Beta Particle and Photon Radioactivity

a) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem/year.

b) Except for the radionuclides listed below, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of a 2 liter per day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, incorporated by reference in Section 611.102. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ must not exceed 4 mrem/year.

AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 mrem/year

Radionuclide	Critical Organ	pCi/L
Tritium	Total body	20,000
Strontium-90	Bone marrow	8

BOARD NOTE: Derived from 40 CFR 141.16 (1987).

SUBPART G: NATIONAL REVISED MCL'S

Section 611.340 Organics

a) The following MCL levels for organic contaminants apply to CWSs and NTNCWS.

CAS No.	Contaminant	MCL

		(mg/L)
71-43-2	Benzene	0.005
75-01-4	Vinyl chloride	0.002
56-23-5	Carbon tetrachloride	0.005
107-06-2	1,2-Dichloroethane	0.005
79-01-6	Trichloroethylene	0.005
75-35-4	1,1-Dichloroethylene	0.007
71-55-6	1,1,1-Trichloroethane	0.20
106-46-7	para-Dichlorobenzene	0.075

b) BATs for achieving compliance with the MCLs for organic contaminants are: central treatment using packed tower aeration; central treatment using granular activated carbon for all these chemicals except vinyl chloride.

BOARD NOTE: Derived from 40 CFR 141.61 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

Section 611.350 Inorganics

The following MCL's for inorganic contaminants apply to CWSs.

Maximum contaminant	Contaminant level in mg/L
Fluoride	4.0

BOARD NOTE: Derived from 40 CFR 141.62 (1987).

Section 611.360 Microbiological Contaminants

a) The MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density.

1) For a PWS which collects at least 40 samples per month, if no more than 5.0 percent of the samples collected during a month are total coliform-positive, the PWS is in compliance with the MCL for total coliforms.

2) For a PWS which collects fewer than 40 samples per month, if no more than one sample collected during a month is total coliform-positive, the PWS is in compliance with the MCL for total coliforms.

b) Any fecal coliform-positive repeat sample or E. coli-positive repeat sample, or any total coliform-positive repeal sample following a fecal coliform-positive or E. coli-positive routine sample, constitutes a violation of the MCL for total coliforms. For purposes of the public notification requirements in Section 611.851 et seq., this is a violation that may pose an acute risk to health.

c) A PWS shall determine compliance with the MCL for total coliforms in subsections (a) and (b) for each month in which it is required to

monitor for total coliforms.

d) BATs for achieving compliance with the MCL for total coliforms in subsections (a) and (b):

1) Protection of wells from contamination by coliforms by appropriate placement and construction;

2) Maintenance of RDC throughout the distribution system;

3) Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs and continual maintenance of positive water pressure in all parts of the distribution system;

4) Filtration and disinfection of surface water, as described in Subpart B, or disinfection of groundwater using strong oxidants such as chlorine, chlorine dioxide or ozone; or

5) The development and implementation of an approved wellhead protection program.

BOARD NOTE: Derived from 40 CFR 141.63 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

SUBPART H: MCL GOALS

Section 611.380 Organics

a) MCLGs are zero for the following contaminants:

1) Benzene

2) Vinyl chloride

3) Carbon tetrachloride

4) 1,2-dichloroethane

5) Trichloroethylene

b) MCLGs for the following contaminants are as indicated:

Contaminant	MCLG (mg/L)
1,1-Dichloroethylene.....	0.007
1,1,1-Trichloroethane.....	0.20
para-Dichlorobenzene.....	0.075

BOARD NOTE: Derived from 40 CFR 141.50 (1987).

Section 611.390 Inorganics

MCLGs for the following contaminants are as indicated:

Contaminant	MCLG (mg/L)
Fluoride.....	4.0

BOARD NOTE: Derived from 40 CFR 141.51 (1987).

Section 611.400 Microbiological Contaminants

MCLGs for the following contaminants are as indicated:

Contaminant	MCLG
Giardia lamblia.....	0.
Viruses.....	0.
Legionella.....	0.

BOARD NOTE: Derived from 40 CFR 141.52 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989, and at 54 Fed. Reg. 27562, June 29, 1989.

SUBPART K: GENERAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.480 Alternative Analytical Techniques

The Agency may approve, by permit condition, an alternate analytical technique. The Agency shall not approve an alternate analytical technique without the concurrence of USEPA. The Agency shall approve an alternate technique if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any MCL. The use of the alternate analytical technique must not decrease the frequency of monitoring required by this Part.

BOARD NOTE: Derived from 40 CFR 141.27 (1987).

Section 611.490 Certified Laboratories

a) For the purpose of deterining compliance with Subparts L through Q, samples will be considered only if they have been analyzed by a laboratory certified by the Agency pursuant to Section 4(o) of the Act, except that measurements for turbidity, free chlorine residual, temperature and pH may be performed under the supervision of a certified operator (35 Ill. Adm. Code 603.103).

b) Nothing in this Part shall be construed to preclude the Agency or any duly designated representative of the Agency from taking samples or from using the results from such samples to determine compliance by a supplier of water with the applicable requirements of this Part.

BOARD NOTE: Derived from 40 CFR 141.28 (1987).

c) The PWS shall have required analyses performed either at its own certified laboratory, or at any other certified laboratory. The Agency may require that some or all of the required samples be submitted to its laboratories.

BOARD NOTE: This is an additional State requirement.

Section 611.491 Laboratory Testing Equipment

a) Each PWS shall have adequate laboratory equipment and capability to perform operational tests (except bacteriological) appropriate to the parameters to be tested and the type of treatment employed. Such equipment must be in good operating condition, and the operator on duty must be familiar with the procedure for erforming the tests.

b) Nothing in this Subpart shall be construed to prevent a supply from running control laboratory tests in an uncertified laboratory. These results are not to be included in the required monitoring results.

BOARD NOTE: This is an additional State requirement.

Section 611.492 Violation of State MCL

This Section applies to MCLs which are marked as "additional State requirements", and for which no specific monitoring, reporting or public notice requirements are specified below. If the results of analysis pursuant to this Part indicates that the level of any contaminant exceeds the MCL, the PWS shall:

a) Report to the Agency within seven days, and initiate three additional analyses at the same sampling point within one month;

b) Notify the Agency and give public notice as specified in Subpart T, when the average of four analyses, rounded to the same number of significant figures as the MCL for the contaminant in question, exceeds the MCL; and,

c) Monitor, after public notification, at a frequency designated by the Agency, and continue monitoring until the MCL has not been exceeded in two consecutive samples, or until a monitoring schedule as a condition of a variance or enforcement action becomes effective.

BOARD NOTE: This is an additional State requirement.

Section 611.493 Frequency of State Monitoring

This Section applies to MCLs which are marked as "additional State requirements", and for which no specific monitoring, reporting or public notice requirements are specified below.

a) Analyses for all CWSs utilizing surface water sources must be repeated at yearly intervals.

b) Analyses for all CWSs utilizing only groundwater sources must be repeated at three-year intervals.

BOARD NOTE: This is an additional State requirement.

Section 611.500 Consecutive PWSs

When a PWS supplies water to one or more other PWSs, the Agency shall modify the monitoring requirements imposed by this Part to the extent that the interconnection of the PWSs jusifies treating them as a single PWS for monitoring purposes. Any modified monitoring must be conducted pursuant to a schedule specified by permit condition. The Agency shall not approve such modified monitoring without the concurrence of USEPA.

BOARD NOTE: Derived from 40 CFR 141.29 (1987).

SUBPART L: MICROBIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.521 Routine Coliform Monitoring

a) PWSs shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan, which must be approved by permit condition.

b) The monitoring frequency for total coliforms for CWSs is based on the population served by the PWS, as follows:

TOTAL COLIFORM MONITORING FREQUENCY
FOR CWSs

Population Served More Than:	Minimum Number of Samples per month
24	1
1000	2
2500	3
3300	4
4100	5
4900	6
5800	7
6700	8
7600	9
8500	10
12,900	15
17,200	20
21,500	25
25,000	30
33,000	40
41,000	50
50,000	60
59,000	70
70,000	80

83,000	90
96,000	100
130,000	120
220,000	150
320,000	180
450,000	210
600,000	240
780,000	270
970,000	300
1,230,000	330
1,520,000	360
1,850,000	390
2,270,000	420
3,020,000	450
3,960,000	480

If a CWS serving 25 to 1,000 persons has no history of total coliform contamination in its current configuration and a sanitary survey conducted in the past five years shows that the PWS is supplied solely by a protected groundwater source and is free of sanitary defects, the Agency shall reduce the monitoring frequency specified above, except that in no case shall the Agency reduce the monitoring frequency to less than one sample per quarter. The Agency shall approve the reduced monitoring frequency by permit condition.

c) The monitoring frequency for total coliforms for non-CWSs is as follows:

1) A non-CWS using only groundwater (except groundwater under the direct influence of surface water, as determined in Section 611.128) and serving 1,000 persons or fewer shall monitor each calendar quarter that the system provides water to the public, except that the Agency shall reduce this monitoring frequency, by permit condition, if a sanitary survey shows that the system is free of sanitary defects. Beginning June 29, 1994, the Agency cannot reduce the monitoring frequency for a non-CWS using only groundwater (except groundwater under the direct influence of surface water) and serving 1,000 persons or fewer to less than once per year.

2) A non-CWS using only groundwater (except groundwater under the direct influence of surface water) and serving more than 1,000 persons during any month shall monitor at the same frequency as a like-sized CWS, as specified in subsection (b), except the Agency shall reduce this monitoring frequency, by permit condition, for any month the system serves 1,000 persons or fewer. The Agency cannot reduce the monitoring to less than once per year. For systems using groundwater under the direct influence of surface water, subsection (c)(4) applies.

3) A non-CWS using surface water, in total or in part, shall monitor at the same frequency as a like-sized CWS, as specified in subsection (b), regardless of the number of persons it serves.

4) A non-CWS using groundwater under the direct influence of surface water, shall monitor at the same frequency as a like-sized CWS, as specified in subsection (b). The system shall begin monitoring at this frequency beginning six months after the Agency determines, pursuant to Section 611.128, that the groundwater is under the direct influence of surface water.

d) The PWS shall collect samples at regular time intervals throughout the month, except that a PWS which uses groundwater (except groundwater under the direct influence of surface water) and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

e) A PWS that uses surface water or groundwater under the direct influence of surface water, and does not practice filtration in compliance with Subpart B, shall collect at least one sample near the first service connection each day the turbidity level of the source water, measured as specified in Section 611.532(b), exceeds 1 NTU. This sample must be analyzed for the presence of total coliforms. When one or more turbidity measurements in any day exceed 1 NTU, the PWS must collect this coliform sample within 24 hours of the first exceedance, unless the Agency has determined, by permit condition, that the PWS, for logistical reasons outside the PWS's control, cannot have the sample analyzed within 30 hours of collection. Sample results from this coliform monitoring must be included in determining compliance with the MCL for total coliforms in Section 611.360.

f) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement or repair, must not be used to determine compliance with the MCL for total coliforms in Section 611.360.

BOARD NOTE: Derived from 40 CFR 141.21(a) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.522 Repeat Coliform Monitoring

a) If a routine sample is total coliform-positive, the PWS shall collect a set of repeat samples within 24 hours of being notified of the positive result. A PWS which collects more than one routine sample per month shall collect no fewer than three repeat samples for each total coliform-positive sample found. A PWS which collects one routine sample per month or fewer shall collect no fewer than four repeat samples for each total coliform-positive sample found. The Agency shall extend the 24-hour limit on a case-by-case basis if the PWS has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In the case of an extension, the Agency shall specify how much time the PWS has to collect the repeat samples.

b) The PWS shall collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and

at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a total coliform-positive sample is at the end of the distribution system, or one away from the end of the distribution system, the PWS is not required to collect at least one repeat sample upstream or downstream of the original sampling site.

c) The PWS shall collect all repeat samples on the same day, except that the Agency shall allow a PWS with a single service connection to collect the required set of repeat samples over a four-day period or to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for PWSs which collect more than one routine sample per month).

d) If one or more repeat samples in the set is total coliform-positive, the PWS shall collect an additional set of repeat samples in the manner specified in subsections (a) through (c). The additional samples must be collected within 24 hours of being notified of the positive result, unless the Agency extends the limit as provided in subsection (a). The PWS shall repeat this process until either total coliforms are not detected in one complete set of repeat samples or the PWS determines that the MCL for total coliforms in Section 611.360 has been exceeded and notifies the Agency.

e) If a PWS collecting fewer than five routine samples/month has one or more total coliform-positive samples and the Agency does not invalidate the sample(s) under Section 611.523, the PWS shall collect at least five routine samples during the next month the PWS provides water to the public, unless the Agency determines that the conditions of subsection (e)(1) or (2) are met. This does not apply to the requirement to collect repeat samples in subsections (a) through (d). The PWS does not have to collect the samples if:

1) The Agency, or a local government unit delegated pursuant to Section 611.108, performs a site visit before the end of the next month the PWS provides water to the public. Although a sanitary survey need not be performed, the site visit must be sufficiently detailed to allow the Agency to determine whether additional monitoring or any corrective action is needed. The Agency cannot approve an employee of the PWS to perform this site visit, even if the employee is an agent approved by the Agency to perform sanitary surveys.

2) The Agency has determined why the sample was total coliform-positive and establishes that the PWS has corrected the problem or will correct the problem before the end of the next month the PWS serves water to the public.

A) The Agency shall document this decision in writing, and make the document available to USEPA and the public. The written documentation must describe the specific cause of the total coliform-positive sample and what action the PWS

has taken or will take to correct the problem.

B) The Agency cannot waive the requirement to collect five routine samples the next month the PWS provides water to the public solely on the grounds that all repeat samples are total coliform-negative.

C) Under this subsection, a PWS shall still take at least one routine sample before the end of the next month it serves water to the public and use it to determine compliance with the MCL for total coliforms in Section 611.360, unless the Agency has determined that the PWS has corrected the contamination problem before the PWS took the set of repeat samples required in subsections (a) through (d), and all repeat samples were total coliform-negative.

f) After a PWS collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliforms, then the PWS may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

g) Results of all routine and repeat samples not invalidated pursuant to Section 611.523 must be included in determining compliance with the MCL for total coliforms in Section 611.360.

BOARD NOTE: Derived from 40 CFR 141.21(b) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.523 Invalidation of Total Coliform Samples

A total coliform-positive sample invalidated under this Section does not count towards meeting the minimum monitoring requirements.

a) The Agency shall invalidate a total coliform-positive sample only if the conditions of subsection (a)(1), (2) or (3) are met.

1) The laboratory establishes that improper sample analysis caused the total coliform-positive result.

2) The Agency, on the basis of the results of repeat samples collected as required by Section 611.522(a) through (d) determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The Agency cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative (e.g., a Agency cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the PWS has only one service connection).

3) The Agency determines that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the PWS shall still collect all repeat samples required under Section 611.522(a) through (d) and use them to determine compliance with the MCL for total coliforms in Section 611.360. To invalidate a total coliform-positive sample under this subsection, the decision with the rationale for the decision must be documented in writing. The Agency shall make this document available to USEPA and the public. The written documentation must state the specific cause of the total coliform-positive sample, and what action the PWS has taken, or will take, to correct this problem. The Agency shall not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

b) A laboratory shall invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), produces a turbid culture in the absence of an acid reaction in the P-A Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the PWS shall collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The PWS shall continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result. The Agency shall waive the 24-hour time limit on a case-by-case basis, if it is not possible to collect the sample within that time.

BOARD NOTE: Derived from 40 CFR 141.21(c) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.524 Sanitary Surveys

a) Requirement to conduct a sanitary survey.

1) PWSs which do not collect five or more routine samples per month shall undergo an initial sanitary survey by June 29, 1994 for CWSs and June 29, 1999 for non-CWSs. Thereafter, PWSs shall undergo another sanitary survey every five years, except that non-CWSs using only disinfected groundwater, from a source which is not under the direct influence of surface water, shall undergo subsequent sanitary surveys at least every ten years after the initial sanitary survey. The Agency shall review the results of each sanitary survey to determine, by permit condition, whether the existing monitoring frequency is adequate and what additional measures, if any, the PWS needs to undertake to improve drinking water quality.

2) In conducting a sanitary survey of a PWS using groundwater, information on sources of contamination within the delineated wellhead protection area that was collected in the course of developing and implementing the wellhead protection program should be considered instead of collecting new information, if the information was collected since the last time the PWS was subject to a sanitary survey.

b) Sanitary surveys must be performed by the Agency or a unit of local government delegated pursuant to Section 611.103. The PWS is reponsible for ensuring the survey takes place.

BOARD NOTE: Derived from 40 CFR 141.21(d) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.525 Fecal Coliform and E. Coli Testing

a) If any routine or repeat sample is total coliform-positive, the PWS shall analyze that total coliform-positive culture medium to determine if fecal coliforms are present, except that the PWS may test for E. coli in lieu of fecal coliforms. If fecal coliforms or E. coli are present, the PWS shall notify the Agency by the end of the day when the PWS is notified of the test result, unless the PWS is notified of the result after the Agency office is closed, in which case the PWS shall notify the Agency before the end of the next business day.

b) The Agency may allow a PWS, on a case-by-case basis, to forgo fecal coliform or E. coli testing on a total coliform-positive sample if that PWS assumes that the total coliform-positive sample is fecal coliform-positive or E. coli-positive. Accordingly, the PWS shall notify the Agency as specified in subsection (a) and the provisions of Section 611.360(b) apply.

BOARD NOTE: Derived from 40 CFR 141.21(e) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.526 Analytical Methodology

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

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

c) PWSs shall conduct total coliform analyses in accordance with one of the following analytical methods, incorporated by reference in Section 611.102:

1) Multiple-Tube Fermentation (MTF) Technique, as set forth in:

A) Standard Methods, Method 908, 908A and 908B, except that 10 fermentation tubes must be used; or

B) Microbiological Methods, Part III, Section B 4.1-4.6.4, pp. 114-118, (Most Probable Number Method), except that 10 fermentation tubes must be used; or

2) Membrance Filter (MF) Technique, as set forth in:

A) Standard Methods, Method 909, 909A and 909B; or

B) Microbiological Methods, Part III, Section B.2.1-2.6, pp. 108-112; or

3) P-A Coliform Test, as set forth in:

A) Standard Methods, Method 908E; or

B) Minimal Medium ONPG-MUG (MMO-MUG) Test

d) In lieu of the 10-tube MTF Technique specified in subsection (c)(1), a PWS may use the MTF Technique using either five tubes (20-ml sample portions or a single culture bottle containing the culture medium for the MTF Technique, i.e., lauryl tryptose broth (formulated as described in Standard Methods, Method 908A, incorporated by reference in Section 611.102) as long as a 100-ml water sample is used in the analysis.

e) PWSs shall 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 bottle 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 Microbiological Methods, referenced above, which use a membrance filter, remove the membrane containing the total coliform colonies from the substrate with a 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). Gently shake the inoculated EC tubes to insure adequate mixing and incubate in a waterbath at 44.5 +/- 0.2 degrees 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) The preparation of EC medium is described in Standard Methods, Method 908C.

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

BOARD NOTE: Derived from 40 CFR 141.21(f) (1987), as amended at

54 Fed. Reg. 27562, June 29, 1989.

Section 611.527 Response to Violation

a) A PWS which has exceeded the MCL for total coliforms in Section 611.360 shall report the violation to the Agency no later than the end of the next business day after it learns of the violation, and notify the public in accordance with Subpart T.

b) A PWS which has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, shall report the monitoring violation to the Agency within ten days after the PWS discovers the violation, and notify the public in accordance with Subpart T.

BOARD NOTE: Derived from 40 CFR 141.21(g) (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.531 Analytical Requirements

Only the analytical method(s) specified in this Section, or otherwise approved by the Agency pursuant to Section 611.480, may be used to demonstrate compliance with the requirements of Subpart B. Measurements for pH, temperature, turbidity and RDCs must be conducted by 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. Until laboratory certification criteria are developed for the analysis of HPC and fecal coliforms, any laboratory certified for total coliform analysis by the Agency is deemed certified for HPC and fecal coliform analysis. The following procedures must be performed by the following methods, incorporated by reference in Section 611.102:

a) Fecal coliform concentration: Standard Methods, Methods 908C, 908D or 909C.

b) Total coliform concentration: Standard Methods, Methods 908A, 908B, 908D, 909A or 909B

BOARD NOTE: PWSs may use a five-tube test or a ten-tube test.

c) HPC: Standard Methods, Method 907A.

d) Turbidity: Standard Methods, Method 214A.

e) RDC:

1) Free chlorine and combined chlorine (chloramines) must be measured by Standard Methods, Methods 408C, 408D, 408E or 408F.

2) Ozone must be measured by the Indigo Method, or automated methods which are calibrated in reference to the results obtained by the Indigo Method on a regular basis, if approved by the Agency.

3) Chlorine dioxide must be measured by Standard Methods, Methods 410B or 410C.

f) Temperature: Standard Methods, Method 212.

g) pH: Standard Methods, Method 423.

BOARD NOTE: Derived from 40 CFR 141.74(a) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.532 Filtered PWSs

A PWS that uses a surface water source and does not provide filtration treatment shall begin monitoring December 31, 1990, unless the Agency has determined, pursuant to Section 611.128, that filtration is required, in which case the Agency shall specify alternative monitoring requirements, as appropriate, until filtration is in place. A PWS that uses a groundwater source under the direct influence of surface water and does not provide filtration treatment shall begin monitoring beginning December 31, 1990, or 6 months after the Agency determines, pursuant to Section 611.128, that the groundwater source is under the direct influence of surface water, whichever is later, unless the Agency has determined that filtration is required, in which case the Agency shall specify alternative monitoring requirements, as appropriate, until filtration is in place.

a) Fecal colifom or total coliform density measurements as required by Section 611.131(a) must be performed on representative source water samples immediately prior to the first or only point of disinfectant application. The PWS shall sample for fecal or total coliforms at the following minimum frequency each week the PWS serves water to the public.

Persons Served More Than:	Samples per Week
0	1
500	2
3300	3
10,000	4
25,000	5

Also, one fecal or total coliform density measurement must be made every day the PWS serves water to the public and the turbidity of the source water exceeds 1 NTU (these samples count towards the weekly coliform sampling requirement) unless the Agency determines that the PWS, for logistical reasons outside the PWS's control cannot have the sample analyzed within 30 hours of collection.

b) Turbidity measurements as required by Section 611.131(b) must be performed on representative grab samples of source water immediately prior to the first or only point of disinfectant application every four hours (or more frequently) that the PWS serves water to the public. A PWS may substitute continuous turbidity monitoring for

grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by permit condition.

c) The total inactivation ratio for each day that the PWS is in operation must be determined based on the CT99.9 values in Appendix B as appropriate. The parameters necessary to determine the total inactivation ratio must be monitored as follows:

1) The temperature of the disinfected water must be measured at least once per day at each RDC sampling point.

2) If the PWS uses chlorine, the pH of the disinfected water must be measured at least once per day at each chlorine RDC sampling point.

3) The disinfectant contact time(s) ("T") must be determined for each day during peak hourly flow.

4) The RDC(s) ("C") of the water before or at the first customer must be measured each day during peak hourly flow.

5) If a PWS uses a disinfectant other than chlorine, the PWS may monitor by other methods approved pursuant to Section 611.141(a)(1) and (2).

d) The total inactivation ratio must be calculated as follows:

1) If the PWS uses only one point of disinfectant application, the PWS may determine the total inactivation ratio based on either of the following two methods:

A) One inactivation ratio (Ai = CTcalc/CT99.9) is determined before or at the first customer during peak hourly flow and, if the Ai is greater than 1.0, the 99.9 percent Giardia lamblia inactivation requirement has been achieved; or

B) Successive Ai values, representing sequential inactivation ratios, are determined between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the following method must be used to calculate the total inactivation ratio:

i) Determine, for each sequence:

$$Ai = CTcalc/CT99.9$$

ii) Add the Ai values together:

$$B = SUM(Ai)$$

iii) If B is greater than 1.0, the 99.9 percent Giardia

lamblia inactivation requirement has been achieved.

2) If the PWS uses more than one point of disinfectant application before or at the first customer, the PWS shall determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hourly flow. The Ai value of each sequence and B must be calculated using the method in subsection (d)(1)(B) to determine if the PWS is in compliance with Section 611.141.

3) Although not required, the total percent inactivation (PI) for a PWS with one or more points of RDC monitoring may be calculated as follows:

$$PI = 100 - (100/10^{3B})$$

e) The RDC of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no more than 5 working days following the failure of the equipment, and PWSs serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed below:

PWS size, by population More than:	Samples per day:
0	1
500	2
1000	3
2500	4

If at any time the residue disinfectant concentration falls below 0.2 mg/L in a system using grab sampling in lieu of continuous monitoring, the PWS shall take a grab sample every 4 hours until the RDC is equal to or greater than 0.2 mg/L.

f) Points of measurement.

1) The RDC must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in Section 611.521 et seq., except that the Agency shall allow a PWS which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source to take disinfectant residual samples at points other than the total coliform sampling points if the Agency determines that such points are more representative of treated (disinfected) water quality within the distribution system. HPC may be measured in lieu of RDC.

2) If the Agency determines, pursuant to Section 611.128, a PWS has

no means for having a sample analyzed for HPC, the requirements of subsection (f)(1) do not apply to that PWS.

BOARD NOTE: Derived from 40 CFR 141.74(b) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.533 Filtered PWSs

A PWS that uses a surface water source or a groundwater source under the influence of surface water and provides filtration treatment shall monitor in accordance with this Section beginning June 29, 1993, or when filtration is installed, whichever is later.

a) Turbidity measurements as required by Section 611.150 must be performed on representative samples of the PWS's filtered water every four hours (or more frequently) that the PWS serves water to the public. A PWS may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy on a regular basis using a protocol approved by permit condition. For any PWSs using slow sand filtration or filtration treatment other than conventional treatment, direct filtration or diatomaceous earth filtration, the Agency shall reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For PWSs serving 500 or fewer persons, the Agency shall reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the Agency determines that less frequent monitoring is sufficient to indicate effective filtration performance.

b) RDC entering distribution system.

1) PWSs serving more than 3300 persons. The RDC of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day, except that, if there is a failure in the continuous monitoring equipment, grab sampling every 4 hours may be conducted in lieu of continuous monitoring, but for no more than 5 working days following the failure of the equipment.

2) PWSs serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day prescribed below. The day's samples cannot be taken at the same time. The sampling intervals must be specified by permit condition.

Persons Served More than:	Samples per Week:
0	1
500	2
1000	3
2500	4

If at any time the RDC falls below 0.2 mg/L in a system using grab sampling in lieu of continuous monitoring, the PWS shall take a grab sample every 4 hours until RDC is equal to or greater than 0.2 mg/L.

c) Points of measurement.

1) The RDC must be measured at least at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in 611.521 et seq., except that the Agency shall allow a PWS which uses both a surface water source or a groundwater source under direct influence of surface water, and a groundwater source, to take RDC samples at points other than the total coliform sampling points if the Agency determines that such points are more representative of treated (disinfected) water quality within the distribution system. HPC may be measured in lieu of RDC.

2) Subsection (c)(1) does not apply if the Agency determines, pursuant to Section 611.128(c), that a system has no means for having a sample analyzed for HPC.

BOARD NOTE: Derived from 40 CFR 141.74(c) (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

SUBPART M: TURBIDITY MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.560 Turbidity

The requirements in this Section apply to unfiltered PWSs until December 30, 1991, unless the Agency has determined prior to that date that filtration is required. The requirements in this Section apply to filtered PWSs until June 29, 1993. The requirements in this Section apply to unfiltered PWSs that the Agency has determined must install filtration, until June 29, 1993, or until filtration is installed, whichever is later.

a) Samples must be taken by suppliers of water for both community and non-CWSs at a representative entry point(s) to the water distribution system at least once per day, for the purposes of making turbidity measurements to determine compliance with Section 611.320. If the Agency determines that a reduced sampling frequency in a non-community will not pose a risk to public health, it can reduce the required sampling frequency. The option of reducing the turbidity frequency will be permitted only in those PWSs that practice disinfection and which maintain an active RDC in the distribution system, and in those cases where the Agency has indicated in writing that no unreasonable risk to health existed under the circumstances of this option. The turbidity measurements must be made in accordance with the following methods, incorporated by reference in Section 611.102: By the Nephelometric Method:

1) Standard Methods, Method 214A; or

2) Inorganic Methods, Method 180.1.

b) If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement must be confirmed by resampling as soon as practicable and preferably within one hour. If the repeat sample confirms that the maximum allowable limit has been exceeded, the supplier of water shall report to the Agency within 48 hours. The repeat sample must be the sample used for the purpose of calculating the monthly average. If the monthly average of the daily samples exceeds the maximum allowable limit, or if the average of two samples taken on consecutive days exceeds 5 TU, the supplier of water shall report to the Agency and notify the public as directed in Subpart T.

c) Sampling for non-CWSs must begin by June 29, 1991.

d) This Section applies only to PWSs which use water obtained in whole or in part from surface sources.

BOARD NOTE: Derived from 40 CFR 141.22 (1987), as amended at 54 Fed. Reg. 27526, June 29, 1989.

SUBPART N: INORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.601 Requirements

a) Analyses for the purpose of determining compliance with Section 611.300 are required as follows:

1) Analyses for all CWSs utilizing surface water sources must be repeated at yearly intervals.

BOARD NOTE: This applies also to additional State requirements.

2) Analyses for all CWSs utilizing only groundwater sources must be repeated at three-year intervals.

BOARD NOTE: This applies also to additional State requirements.

3) For non-CWSs, whether supplied by surface or ground sources, analyses for nitrate must be repeated at intervals specified by permit condition.

b) If the result of an analysis made under subsection (a) or Section 611.607 indicates that the level of any contaminant listed in Section 611.300 or 611.350 exceeds the MCL, the PWS shall report to the Agency within 7 days and initiate three additional analyses at the same sampling point within one month.

BOARD NOTE: This applies also to additional State requirements.

c) When the average of four analyses made pursuant to subsection (b), rounded to the same number of significant figures as the MCL for the substance in question, exceeds the MCL, the supplier of water shall

notify the Agency and give notice to the public pursuant to Subpart T. Monitoring after public notification must be at a frequency designated by the Agency and must continue until the MCL has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, adjusted standard or enforcement action becomes effective.

BOARD NOTE: This applies also to additional State requirements.

d) The provisions of subsections (b) and (c) notwithstanding, compliance with the MCL of nitrate must be determined on the basis of the mean of two analyses. When a level exceeding the MCL for nitrate is found, a second analysis must be initiated within 24 hours, and if the mean of the two analyses exceeds the MCL, the supplier of water shall report his findings to the Agency and shall notify the public pursuant to Subpart T.

BOARD NOTE: Derived from 40 CFR 141.23(a) through (d) (1987), as amended at 53 Fed. Reg. 5146, February 19, 1988.

Section 611.606 Analytical Methods

Analyses conducted to determine compliance with Section 611.300 or 611.350 must be made in accordance with the following methods, incorporated by reference in Section 611.102. For approved analytical procedures for metals, the technique applicable to total metals must be used.

a) Arsenic:

1) ASTM Method D2972; or

2) Standard Methods:

A) Method 301A VII; or

B) Method 404A and 404B(4), Spectrophotometric, Silver Diethyldithiocarbamate; or

3) USGS Methods, Method I-1062-78, pp. 61-63, Atomic Absorption - Gaseous Hydride; or

4) Inorganic Methods:

A) Method 206.2, Atomic Absorption Furnace Technique; or

B) Method 206.3; or

C) Method 206.4; or

5) Inductively Coupled Plasma Method 200.7.

b) Barium:

1) Standard Methods, Method 301A IV, Atomic Absorption - Direct

Aspiration; or

2) Inorganic Methods:

A) Method 208.1; or

B) Method 208.2, Atomic Absorption Furnace Technique; or

3) Inductively Coupled Plasma Method 200.7.

c) Cadmium:

1) ASTM Method D 3557A or B; or

2) Standard Methods, Method 301A II or III, Atomic Absorption - Direct Aspiration; or

3) Inorganic Methods:

A) Method 213.1; or

B) Method 213.2, Atomic Absorption Furnace Technique; or

4) Inductively Coupled Plasma Method 200.7.

d) Chromium:

1) ASTM Method D 1687; or

2) Standard Methods, Method 301A II or III, Atomic Absorption - Direct Aspiration; or

3) Inorganic Methods:

A) Method 218.1; or

B) Method 218.2, Atomic Absorption Furnace Technique; or

4) Inductively Coupled Plasma Method 200.7.

e) Lead:

1) ASTM Method D 3559; or

2) Standard Methods, Method 301A II or III, Atomic Absorption - Direct Aspiration; or

3) Inorganic Methods:

A) Method 239.1; or

B) Method 239.2, Atomic Absorption Furnace Technique.

f) Mercury:

1) ASTM Method D 3223; or

2) Standard Methods, Method 301A VI, Manual Cold Vapor Technique; or

3) Inorganic Methods:

A) Method 245.1; or

B) Method 245.2, Automated Cold Vapor Technique.

g) Nitrate:

1) ASTM: Method D 3867; or

2) Standard Methods:

A) Method 419C, Spectrometric, Cadmium Reduction;

B) Method 419D, Colorimetric Brucine; or

C) Method 605, Automated Cadmium Reduction.

3) Inorganic Methods:

A) Method 352.1; or

B) Method 353.1, Automated Hydrazine Reduction; or

C) Method 353.2; or

D) Method 353.3; or

h) Selenium:

1) Inorganic Methods

A) Method 270.2, Atomic Absorption Furnace Technique; or

B) Method 270.3; or

3) USGS Methods, Method I-1667-78, pp. 237-239; or

4) ASTM Method D 3859; or

5) Standard Methods, Method 301A VII, Hydride Generation - Atomic Absorption Spectrophotometry.

i) Silver:

1) Standard Methods, Method 301A II, Atomic Absorption - Direct Aspiration; or

2) Inorganic Methods:

A) Method 272.1; or

B) Method 272.2, Atomic Absorption Furnace Technique; or

3) Inductively Coupled Plasma Method 200.7.

j) Fluoride:

1) ASTM D 1179; or

2) Standard Methods:

A) Methods 43A and 43C;

B) Method 413B;

C) Method 413E; or

3) Inorganic Methods:

A) Method 340.1;

B) Method 340.2;

B) Method 340.3; or

4) Technicon Methods:

A) #129-71W;

B) 380-75WE.

BOARD NOTE: Derived from 40 CFR 141.23(f) (1987), as amended at 53 Fed. Reg. 5146, February 19, 1988.

k) Manganese:

1) ASTM D 858;

2) Standard Methods:

A) Methods 303 A or B;

B) Method 304; or

C) Method 319 B;

BOARD NOTE: These methods are used for additional State requirements.

l) Iron:

1) ASTM D 1068;

2) Standard Methods:

A) Methods 303 A or B;

B) Method 304; or

C) Method 315 B.

BOARD NOTE: These methods are used for additional State requirements.

m) Copper:

1) ASTM D 1688;

2) Standard Methods:

A) Methods 303 A or B;

B) Method 304; or,

C) Method 313 B.

BOARD NOTE: These methods are used for additional State requirements.

n) Zinc:

1) ASTM D 1691;

2) Standard Methods:

A) Methods 303 A or B;

B) Method 304; or,

C) Method 328 C.

BOARD NOTE: These methods are used for additional State requirements.

o) Cyanide:

1) ASTM D 2036;

2) Standard Methods: Methods 412 B, C, D or F.

BOARD NOTE: These methods are used for additional State requirements.

Section 611.607 Fluoride Monitoring

In addition to complying with Section 611.601 through 611.606, PWSs monitoring for fluoride shall comply with the requirements of this Section.

a) Sampling points.

1) Where the PWS draws water from one source, the PWS shall take one sample at the entry point to the distribution system.

2) Where the PWS draws water from more than one source, the PWS shall sample each source at the entry points to the distribution system.

3) If the PWS draws water from more than one source and sources are combined before distribution, the PWS shall sample at an entry point to the distribution system during periods representative of the maximum fluoride levels occurring under normal operating conditions.

b) The Agency shall, by permit condition, alter the frequencies for fluoride monitoring as set out in Section 611.601(a) to increase or decrease such frequency considering the following factors:

1) Reported concentrations from previously required monitoring,

2) The degree of variation in reported concentrations and,

3) Other factors which affect fluoride concentrations such as changes in pumping rates in groundwater supplies or significant changes in the PWS's configuration, operating procedures, source of water and changes in stream flows.

c) Monitoring shall be decreased from the frequencies specified in Section 611.601(a) upon application by the PWS if the Agency determines that the PWS is unlikely to exceed the MCL, considering the factors listed in subsection (b). Such determination must be by permit condition. In no case shall monitoring be reduced to less than one sample every 10 years. For PWSs monitoring once every 10 years, the Agency shall review the monitoring results every ten years to determine whether more frequent monitoring is necessary.

d) Analyses for fluoride under this Section may only be used for determining compliance if conducted by laboratories that have analyzed performance evaluation samples to within +/-10% of the reference value at fluoride concentrations from 1.0 mg/L to 10.0 mg/L, within the last 12 months.

e) Compliance with the MCL must be determined based on each sampling point. If any sampling point is determined to be out of compliance, the PWS is deemed to be out of compliance.

BOARD NOTE: Derived from 40 CFR 141.23(g) (1987), as amended at 53 Fed. Reg. 5146, February 19, 1988.

Section 611.610 Special Monitoring for Sodium

a) CWSs shall collect and analyze one sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples must be collected and analyzed annually for CWSs utilizing surface water sources in whole or in part, and at least every three years for CWSs utilizing solely groundwater sources. The minimum number of samples required to be taken by the CWS is based on the number of treatment plants used by the CWS, except that multiple wells drawing raw water from a single aquifer may, with the Agency approval, be considered one treatment plant for determining the minimum number of samples. The Agency shall require the CWS to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.

b) The CWS shall report to the Agency the results of the analyses for sodium within the first 10 days of the month following the month in which the sample results were received or within the first 10 days following the end of the required monitoring period as specified by permit condition, whichever of these is first. If more than annual sampling is required the supplier shall report the average sodium concentration within 10 days of the month following the month in which the analytical results of the last sample used for the annual average was received.

c) The CWS shall notify the Agency and appropriate local public health officials of the sodium levels by written notice by direct mail within three months. A copy of each notice required to be provided by this subsection must be sent to the Agency within 10 days of its issuance.

d) Analyses for sodium must be performed by the following methods, incorporated by reference in Section 611.102:

1) Standard Methods, Method 325B, flame photometric method;

2) Inorganic Methods:

A) Method 273.1, Atomic Absorption - Direct Aspiration; or

B) Method 273.2, Atomic Absorption - Graphite Furnace; or

3) ASTM Method D1428.

BOARD NOTE: Derived from 40 CFR 141.41 (1987).

Section 611.621 Corrosivity Characteristics

a) CWSs shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water.

1) The CWS shall collect two samples per plant for analysis for each plant using surface water sources wholly or in part: one during mid-winter and one during mid-summer. The CWS shall

collect one sample per plant for analysis for each plant using groundwater sources. The minimum number of samples required to be taken by the CWS must be based on the number of treatment plants used by the CWS, except that multiple wells drawing raw water from a single aquifer are, if authorized by permit condition, considered one treatment plant for determining the minimum number of samples.

2) Determination of the corrosivity characteristics of the water must include measurement of pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue) and calculation of the Langelier Index in accordance with Section 611.623.

A) The determination of corrosivity characteristics must be based on one round of sampling (two samples per plant for surface water and one sample per plant for groundwater sources).

B) If approved by permit condition, the CWS may use the Aggressive Index, as described in Section 611.623, instead of the Langelier Index.

b) The CWS shall report to the Agency the results of the analyses for the corrosivity characteristics within the first 10 days of the month following the month in which the sample results were received. If more frequent sampling is required by permit condition, the CWS may accumulate the data and shall report each value within 10 days of the month following the month in which the analytical results of the last sample was received.

BOARD NOTE: Derived from 40 CFR 141.42(a) and (b), (1987).

Section 611.623 Analytical Methods for Corrosivity

Analyses conducted to determine the corrosivity of the water must be made in accordance to the following methods, incorporated by reference in Section 611.102:

a) Langelier Index: Standard Methods, Method 203.

b) Aggressive Index: AWWA C400-77, Revision of C400-75.

c) Total Filtrable Residue:

1) Standard Methods, Method 208B; or

2) Inorganic Methods, Method 160.1.

d) Temperature: Standard Methods, Method 212.

e) Calcium:

1) Standard Methods, Method 306C, EDTA titrimetric method; or

2) ASTM Method D 1126; or

3) Inorganic Methods, Method 215.2.

f) Alkalinity:

1) Standard Methods, Method 403, Methyl Orange end point pH 4.5; or

2) ASTM Method D 1067; or

3) Inorganic Methods, Method 310.1.

g) pH:

1) Standard Methods, Method 424; or

2) Inorganic Methods, Method 150.1; or

3) ASTM Method D 1293.

h) Chloride: Standard Methods, Method 407C, Potentiometric Method

i) Sulfate:

1) Inorganic Methods, Turbidimetric Method; or

2) Standard Methods, Methods 426A through 426D.

BOARD NOTE: Derived from 40 CFR 141.42(c) (1987).

Section 611.624 Construction Material Identification

CWSs shall identify whether the following construction materials are present in their distribution system and report to the Agency:

a) Lead from piping, solder, caulking, interior lining of distribution mains,

b) Alloys and home plumbing.

c) Copper from piping and alloys, service lines and home plumbing.

d) Galvanized piping, service lines and home plumbing.

e) Ferrous piping materials such as cast iron and steel.

f) Asbestos cement pipe.

BOARD NOTE: Derived from 40 CFR 141.42(d), (1987).

SUBPART O: ORGANIC MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.641 Sampling and Analytical Requirements

a) An analysis of substances for the purpose of determining compliance with Section 611.310(a) and (b) must be made as follows:

1) The Agency shall, by permit condition, require CWSs utilizing surface water sources to collect samples during the period of the year when contamination by pesticides is most likely to occur. The Agency shall require the CWS to repeat these analyses at least annually.

BOARD NOTE: This applies also to additional State requirements.

2) The Agency shall, by permit condition, require CWSs utilizing only groundwater sources to collect samples at least once every three years.

BOARD NOTE: This applies also to additional State requirements.

b) If the result of an analysis made pursuant to subsection (a) indicates that the level of any contaminant listed in Section 611.310 (a) and (b) exceeds the MCL, the CWS shall report to the Agency within 7 days and initiate three additional analyses within one month.

c) When the average of four analyses made pursuant to subsection (b), rounded to the same number of significant figures as the MCL for the substance in question, exceeds the MCL, the CWS shall report to the Agency and give notice to the public pursuant to Subpart T. Monitoring after public notification must be at a frequency designated by the Agency and must continue until the MCL has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, adjusted standard or enforcement action becomes effective.

BOARD NOTE: Derived from 40 CFR 141.24(a) through (d) (1987), as amended at 53 Fed. Reg. 5146, February 19, 1988.

Section 611.645 Analytical Methods

a) Analysis made to determine compliance with Section 611.310(a) must be made in accordance with the following methods, incorporated by reference in Section 611.102, or alternative methods approved pursuant to Section 611.480:

1) Pesticide Methods; or

2) ASTM Method D 3086; or

3) Standard Methods, Method 509A; or

4) USGS Methods, Book 5, Chapter A-3, pp. 24-39; or

5) SPE Test Method, SPE 500.

b) Analysis made to determine compliance with Section 611.310(b) must be conducted in accordance with:

1) Pesticide Methods; or

2) ASTM Method D 3478; or

3) Standard Methods, Method 509B; or

4) USGS Method, Book 5, Chapter A-3, pp. 24-39.

BOARD NOTE: Derived from 40 CFR 141.24(e,f) (1987), as amended at 53 Fed. Reg. 5146, February 19, 1988.

Section 611.648 Sampling for Revised MCLs

Analysis of the contaminants listed in Section 611.340(a) for purposes of determining compliance with the MCLs must be conducted as follows:

a) CWSs using groundwater sources shall sample at points of entry to the distribution system representative of each well after any application of treatment. Sampling must be conducted at the same location(s) or more representative location(s) every three months for one year except as provided in subsection (h)(1).

b) CWSs using surface water shall sample at points in the distribution system representative of each source or at entry points to the distribution system after any application of treatment. Surface water systems must sample each source every three months except as provided in subsection (h)(2). Sampling must be conducted at the same location or a more representative location each quarter.

c) If the CWS draws water from more than one source and sources are combined before distribution, the CWS shall sample at an entry point to the distribution system during periods of normal operating conditions.

d) Time for sampling.

1) All CWSs and NTNCWSs serving more than 3,300 people shall analyze all distribution or entry-point samples, as appropriate, representing all source waters.

2) All other CWSs and NTNCWSs shall analyze distribution or entry-point samples, as required in this paragraph, representing all source waters beginning no later than January 1, 1991.

e) If the results exceed the MCL, the CWS shall initiate three additional analyses at the same sampling point within one month. The sample results must be averaged with the first sampling result and used for compliance determination in accordance with subsection (i). The Agency shall delete results of obvious sampling errors from this calculation.

f) Analysis for vinyl chloride is required only for groundwater systems that have detected one or more of the following two-carbon organic compounds: Trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene or 1,1-dichloroethylene. The analysis for vinyl chloride is required at each distribution or entry point at which one or more of the two-carbon organic compounds were found. If the first analysis does not detect vinyl chloride, the Agency shall reduce the frequency of vinyl chloride monitoring to once every three years for that sample location or other sample locations which are more representative of the same source.

g) The Agency or CWSs may composite up to five samples from one or more CWSs. Compositing of samples is to be done in the laboratory by the procedures listed below. Samples must be analyzed within fourteen days of collection. If any organic contaminant listed in Section 611.340 is detected in the original composite sample, a sample from each source that made up the composite sample must be reanalyzed individually within fourteen days from sampling. The sample for reanalysis cannot be the original sample but can be a duplicate sample. If duplicates of the original samples are not available, new samples must be taken from each source used in the original composite and analyzed for organic contaminants. Reanalysis must be accomplished within fourteen days of the second sample. To composite samples, the following procedure must be followed:

1) Compositing samples prior to GC analysis.

A) Add 5 ml or equal larger amounts of each sample (up to 5 samples are allowed) to a 25 ml glass syringe. Special precautions must be made to maintain zero headspace in the syringe.

B) The samples must be cooled at 4 degrees C during this step to minimize volatilization losses.

C) Mix well and draw out a 5-ml aliquot for analysis.

D) Follow sample introduction, purging and desorption steps described in the method.

E) If less than five samples are used for compositing, a proportionately smaller syringe may be used.

1) Compositing samples prior to GC/MS analysis.

A) Inject 5-ml or equal larger amounts of each aqueous sample (up to 5 samples are allowed) into a 25-ml purging device using the sample introduciton technique described in the method.

B) The total volume of the sample in the purging device must be 25 ml.

C) Purge and desorb as described in the method.

h) The Agency shall, by permit condition, reduce the monitoring frequency specified in subsections (a) and (b) as follows:

1) The monitoring frequency for groundwater systems is as follows:

A) When organic contaminants are not detected in the first sample (or any subsequent samples that may be taken and the CWS is not vulnerable as defined in subsection (h)(4), monitoring may be reduced to one sample and must be repeated every 5 years.

B) When organic contaminants are not detected in the first sample (or any subsequent sample that may be taken) and the CWS is vulnerable as defined in subsection (h)(4):

i) Monitoring one sample must be repeated every 3 years for CWSs with more than 500 connections.

ii) Monitoring one sample must be repeated every 5 years for CWSs with less than 500 connections.

C) If organic contaminants are detected in the first sample (or any subsequent sample that may be taken) regardless of vulnerability, monitoring must be repeated every 3 months, as required under subsection (a).

2) The repeat monitoring frequency for surface water systems is as follows:

A) When organic contaminants are not detected in the first year of quarterly sampling (or any other subsequent sample that may be taken) and the CWS is not vulnerable as defined in subsection (h)(4), additional monitoring is not required.

B) When organic contaminants are not detected in the first year of quarterly sampling (or any other subsequent sample that may be taken) and the CWS is vulnerable as defined in subsection (h)(4):

i) Monitoring must be repeated every three years (for CWSs with more than 500 connections).

ii) Monitoring must be repeated every five years (for CWSs with less than 500 connections).

C) When organic contaminants are detected in the first year of quarterly sampling (or any other subsequent sample that may be taken), regardless of vulnerability, monitoring must be repeated every 3 months, as required under subsection (b).

3) The Agency shall, by permit condition, reduce the frequency of

monitoring to once per year for a groundwater system or surface water system detecting organic contaminants at levels consistently less than the MCL for three consecutive years.

4) Vulnerability of each CWS must be determined by the Agency based upon an assessment of the following factors:

A) Previous monitoring results.

B) Number of persons served by CWS.

C) Proximity of a smaller CWS to a larger CWS.

D) Proximity to commercial or industrial use, disposal or storage of the organic chemicals listed in Section 611.340.

E) Protection of the water source.

5) A CWS is deemed to be vulnerable for a period of three years after any positive measurement of one or more contaminants listed in Sections 611.650(e), 611.657(d) or 611.340(a), except for THMs or other demonstrated disinfection by-products.

i) Compliance with Section 611.340(a) is determined based on the results of running annual average of quarterly sampling for each sampling location. If one location's average is greater than the MCL, then the CWS is deemed to be out of compliance. If a CWS has a distribution system separable from other parts of the distribution system with no interconnections, only that part of the system that exceeds any MCL as specified in Section 611.340(a) is deemed out of compliance. The Agency shall reduce the public notice requirement to that portion of the CWS which is out of compliance. If any one sample result would cause the annual average to be exceeded, then the CWS is deemed to be out of compliance immediately. For CWSs that only take one sample per location because no organic contaminants were detected, compliance is based on that one sample.

j) Analysis under this Section must be conducted using the following methods or alternatives approved pursuant to Section 611.480. These methods are contained in Organic Methods, incorporated by reference in Section 611.102:

1) Method 502.1.

2) Method 503.1.

3) Method 524.1.

4) Method 524.2.

5) Method 502.2.

k) Analysis under this Section must only be conducted by laboratories that have received conditional approval by the Agency, pursuant to

Section 611.490, according to the following conditions:

1) To receive conditional approval to conduct analyses for benzene, vinyl chloride, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene, 1,1-dichloroethylene, 1,1,1-trichloroethane and paradichlorobenzene the laboratory shall:

   A) Analyze performance evaluation samples which include these substances provided by the Agency.

   B) Achieve the quantitative acceptance limits under subsection (k)(1)(C) or (D) for at least six of the seven subject organic chemicals.

   C) Achieve quantitative results on the analyses performed under subsection (k)(1)(A) that are within +/- 20 percent of the actual amount of the substances in the performance evaluation sample when the actual amount is greater than or equal to 0.010 mg/L.

   D) Achieve quantitative results on the analyses performed under subsection (k)(1)(A) that are within +/- 40 percent of the actual amount of the substances in the performance evaluation sample when the actual amount is less than 0.010 mg/L.

   E) Achieve a method detection limit of 0.0005 mg/L, according to the procedures in 40 CFR 136, App. B, incorporated by reference in Section 611.102

   F) Be currently approved by the Agency for the analyses of THMs under Subpart P.

2) To receive conditional approval for vinyl chloride, the laboratory shall:

   A) Analyze performance evaluation samples provided by the Agency.

   B) Achieve quantitative results on the analyses performed under subsection (k)(2)(A) that are within +/- 40 percent of the actual amount of vinyl chloride in the performance evaluation sample.

   C) Achieve a method detection limit of 0.0005 mg/L, according to the procedures in 40 CFR 136, App. B, incorporated by reference in Section 611.102.

   D) Receive approval or be currently approved by the Agency under subsection (k)(1).

m) The Agency shall, by permit condition, increase required monitoring where necessary to detect variations within the CWS.

o) Each approved laboratory shall determine the method detection limit (MDL), as defined in 40 CFR 136, App. B, incorporated by reference in Section 611.102, at which it is capable of detecting organic contaminants. The acceptable MDL is 0.0005 mg/L. This concentration is the detection level for purposes of subsections (e), (f), (g) and (h).

BOARD NOTE: Derived from 40 CFR 141.24(g) (1987), as amended at 52 Fed. Reg. 25712 July 8, 1987, and 53 Fed. Reg. 25109, July 1, 1988.

Section 611.650 Special Monitoring

a) All CWSs and NTNCWSs shall monitor for the contaminants listed in subsection (e) by the following dates:

1) Less than 3300 persons served: monitoring to begin no later than January 1, 1991.

2) All others: immediately.

b) Surface water systems shall sample at points in the distribution system representative of each water source or at entry points to the distribution system after any applicaiton of treatment. The minimum number of samples is one year of quarterly samples per water source.

c) Groundwater systems shall sample at points of entry to the distribution system representative of each well after any application of treatment. The minimum number of samples is one sample per entry point to the distribution system.

e) CWSs and NTNCWS shall monitor for the following contaminants except as provided in subsection (f):

1) Chloroform

2) Bromodichloromethane

3) Chlorodibromomethane

4) Bromoform

5) trans-1,2-Dichloroethylene

6) Chlorobenzene

7) m-Dichlorobenzene

8) Dichloromethane

9) cis-1,2-Dichloroethylene

10) o-Dichlorobenzene

11) Dibromomethane

12) 1,1-Dichloropropene

13) Tetrachloroethylene

14) Toluene

15) p-Xylene

16) o-Xylene

17) m-Xylene

18) 1,1-Dichloroethane

19) 1,2-Dichloropropane

20) 1,1,2,2-Tetrachloroethane

21) Ethylbenzene

22) 1,3-Dichloropropane

23) Styrene

24) Chloromethane

25) Bromomethane

26) 1,2,3-Trichloropropane

27) 1,1,1,2-Tetrachloroethane

28) Chloroethane

29) 1,1,2-Trichloroethane

30) 2,2-Dichloropropane

31) o-Chlorotoluene

32) p-Chlorotoluene

33) Bromobenzene

34) 1,3-Dichloropropene

35) Ethylene dibromide (EDB)

36) 1,2-Dibromo-3-chloropropane (DBCP)

f) CWSs and NTNCWS shall monitor for EDB and DBCP only if the Agency determines they are vulnerable to contamination by either or both of these substances. For the purpose of this subsection, a "vulnerable

system" is defined as a system which is potentially contaminated by EDB and DBCP, including surface water systems where these two compounds are applied, manufactured, stored, disposed of or shipped upstream, and for groundwater systems in areas where the compounds are applied, manufactured, stored, disposed of or shipped in the groundwater recharge basin, or for groundwater systems that are in proximity to underground storage tanks that contain leaded gasoline.

BOARD NOTE: Derived from 40 CFR 141.40(a) through (f) (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987, and at 53 Fed. Reg. 25109, July 1, 1988.

Section 611.657 Analytical Methods for Special Monitoring

a) Analysis under Section 611.650 must be conducted using the following methods found in Organic Methods, incorporated by reference in Section 611.102:

1) Method 502.1;

2) Method 503.1;

3) Method 524.1;

4) Method 524.2;

5) Method 502.2; or

6) Method 504.

b) Analysis under this Section must only be conducted by laboratories approved under Section 611.648(k). In addition to the requirements of that Section, each laboratory analyzing for EDB and DBCP shall achieve a method detection limit for EDB and DBCP of 0.00002 mg/L, according to the procedures in 40 CFR 136, App. B, incorporated by reference in Section 611.102.

c) PWSs may use monitoring data collected any time after January 1, 1983 to meet the requirements for unregulated monitoring, provided that the monitoring program was consistent with the requirements of this Section. In addition, the results of a groundwater supply survey may be used in a similar manner for PWSs supplied by a single well.

e) Instead of performing the monitoring required by this Section, a CWS or NTNCWS serving fewer than 150 service connections may send a letter to the Agency stating that the PWS is available for sampling. This letter must be sent to the Agency no later than January 1, 1991. The PWS shall not send such samples to the Agency, unless requested to do so by the Agency.

f) All CWSs and NTNCWSs shall repeat the monitoring required in Section 611.650 no less frequently than every five years from the dates specified in Section 611.650(a).

g) Agencys or PWSs may composite up to five samples when monitoring for substances in Section 611.650(e).

BOARD NOTE: Derived from 40 CFR 141.40(g-m) (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987, and at 53 Fed. Reg. 25109, July 1, 1988.

SUBPART P: THM MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.680 Sampling, Analytical and other Requirements

a) Required monitoring.

1) CWSs which serve a population of 10,000 or more individuals and which add a disinfectant (oxidant) to the water in any part of the drinking water treatment process shall analyze for TTHMs in accordance with this Section.

2) For the purpose of this Section, the minimum number of samples required to be taken by the system must be based on the number of treatment plants used by the system. However, the Agency shall, by permit condition, 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) Surface water sources.

1) For all CWSs utilizing surface water sources in whole or in part, and for all CWSs utilizing only groundwater sources, 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 of the water in the system. The remaining 75 percent must be taken at representative locations in the distribution system, taking into account 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 of the CWS'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, the Agency shall, by permit condition, 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 maximum residence time of the water in the

system, if the Agency determines that the data from at least 1 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 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 makes any significant change to its source of water or treatment program, the CWS shall immediately begin monitoring in accordance with the requirements of subsection (b)(1), which monitoring must continue for at least 1 year before the frequency may be reduced again. The Agency shall, by permit condition, require monitoring in excess of the minimum frequency where it is necessary to detect variations of TTHM levels within the distribution system.

BOARD NOTE: Derived from 40 CFR 141.30(a,b) (1987).

Section 611.683 Reduced Monitoring Frequency

a) A CWS utilizing only groundwater sources may, by permit application, seek to have the monitoring frequency required by Section 611.681(b)(1) reduced to a minimum of one sample for maximum TTHM potential per year for each treatment plant used by the CWS, taken at a point in the distribution system reflecting maximum residence time of the water in the system.

1) The CWS shall submit to the Agency the results of at least one sample analyzed for maximum TTHM potential for each treatment plant used by the CWS, taken at a point in the distribution system reflecting the maximum residence time of the water in the system.

2) The Agency shall reduce the CWS's monitoring frequency if it determines that, based upon the data submitted by the CWS, the CWS has a maximum TTHM potential of less than 0.10 mg/L and that, based upon an assessment of the local conditions of the CWS, the CWS is not likely to approach or exceed the MCL for TTHMs.

3) The results of all analyses must be reported to the Agency within 30 days of the CWS's receipt of such results.

4) All samples collected must be used for determining whether the CWS complies with the monitoring requirements of Section 611.681(b), unless the analytical results are invalidated for technical reasons.

5) Sampling and analyses must be conducted in accordance with the methods listed in Section 611.685.

b) Loss or modification of reduced monitoring frequency.

1) If the results from any analysis taken by the CWS for maximum TTHM potential are equal to or greater than 0.10 mg/L, and such results are confirmed by at least one check sample taken promptly after such results are received, the CWS shall immediately begin monitoring in accordance with the requirements of Section 611.681(b), and such monitoring must continue for at least one year before the frequency may be reduced again.

2) In the event of any significant change to the CWS's raw water or treatment program, the CWS shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting maximum residence time of the water in the system.

3) The Agency shall require increased monitoring frequencies above the minimum where necessary to detect variation of TTHM levels within the distribution system.

BOARD NOTE: Derived from 40 CFR 141.30 (c) (1987).

Section 611.684 Averaging

Compliance with Section 611.310(c) is determined based on a running annual average of quarterly samples collected by the CWS as prescribed in Section 611.681(b)(1) or (2). If the average of samples covering any 12 month period exceeds the MCL, the CWS shall report to the Agency and notify the public pursuant to Subpart T. Monitoring after public notification must be at a frequency designated by the Agency and must continue until a monitoring schedule as a condition to a variance, adjusted standard or enforcement action becomes effective.

BOARD NOTE: Derived from 40 CFR 141.30(d) (1987).

Section 611.685 Analytical Methods

Sampling and analyses made pursuant to this Subpart must be conducted by one of the following methods, incorporated by reference in Section 611.102:

a) "The Analysis of Trihalomethanes in Drinking Waters by the Purge and Trap Method," Method 501.1.

b) "The Analysis of Trihalomethanes in Drinking Water by Liquid/Liquid Extraction," Method 501.2. Samples for TTHM must be dechlorinated upon collection to prevent further production of Trihalomethanes, according to the procedures described in the above two methods. Samples for maximum TTHM potential must not be dechlorinated, and must be held for seven days at 25 degrees C (or above) prior to analysis, according to the procedures described in the above two methods.

BOARD NOTE: Derived from 40 CFR 141.30(e) (1987).

Section 611.686 Modification to System

Before a CWS makes any significant modifications to its existing treatment process for the purposes of achieving compliance with Section 611.310(c), the CWS shall submit, by way of permit application, a detailed plan setting forth its proposed modification and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by the CWS will not be adversely affected by such modification. Upon approval, the plan will become a permit condition. At a minimum, the plan must require the CWS modifying its disinfection practice to:

a) Evaluate the water system for sanitary defects and evaluate the source water for biological quality;

b) Evaluate its existing treatment practices and consider improvements that will minimize disinfectant demand and optimize finished water quality throughout the distribution system;

c) Provide baseline water quality survey data of the distribution system. Such data should include the results from monitoring for coliform and fecal coliform bacteria, fecal streptococci, standard plate counts at 35 degrees C and 20 degrees C, phosphate, ammonia nitrogen and total organic carbon. Virus studies are required where source waters are heavily contaminated with sewage effluent;

d) Conduct additional monitoring to assure continued maintenance of optimal biological quality in finished water, for example, when chloramines are introduced as disinfectants or when pre-chlorination is being discontinued. Additional monitoring should also be required by the Agency for chlorate, chlorite and chlorine dioxide when chlorine dioxide is used. Standard plate count analyses should also be required by the Agency as appropriate before and after any modifications;

e) Consider inclusion in the plan of provisions to maintain an active RDC throughout the distribution system at all times during and after the modification.

BOARD NOTE: Derived from 40 CFR 141.30(f) (1987).

SUBPART Q: RADIOLOGICAL MONITORING AND ANALYTICAL REQUIREMENTS

Section 611.720 Analytical Methods

a) The methods specified below, incorporated by reference in Section 611.102, are to be used to determine compliance with Sections 611.330 and 611.331, except in cases where alternative methods have been approved in accordance with Section 611.480.

1) Radiochemical Methods;

2) Standard Methods:

A) Gross Alpha and Beta: Method 302;

B) Total Radium: Method 304;

C) Radium-226: Method 305;

D) Strontium-89,90: Method 303;

E) Tritium: Method 306;

3) ASTM Methods:

A) Cesium-134: ASTM D-2459;

B) Uranium: ASTM D-2907.

b) When the identification and measurement of radionuclides other than those listed in subsection (a) is 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 USEPA.

2) HASL Procedure Manual, HASL 300, available from 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 (1.96 delta where delta is the standard deviation of the net counting rate of the sample).

1) To determine compliance with Section 611.330(a) the detection limit must not exceed 1 pCi/L. To determine compliance with Section 611.330(b) the detection limit must not exceed 3 pCi/L.

2) To determine compliance with Section 611.331 the detection limits must not exceed the concentrations listed in that Section.

d) To judge compliance with the MCLs listed in Sections 611.330 and 611.331, 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 (1987).

Section 611.731 Gross Alpha

Monitoring requirements for gross alpha particle activity, radium-226 and radium-228 are as follows:

a) Compliance must be based on the analysis of an annual composite of four consecutive quarterly samples or the average of the analyses of four samples obtained at quarterly intervals.

1) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis; provided, that, the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 percent (1.65 delta where delta is the standard deviation of the net counting rate of the sample). In localities where radium-228 may be present in drinking water, the Agency may, by permit condition, require radium-226 or radium-228 analyses when the gross alpha particle activity exceeds 2 pCi/L.

2) When the gross alpha particle activity exceeds 5 pCi/L, the same or an equivalent sample must be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/L the same or an equivalent sample must be analyzed for radium-228.

c) CWS's shall monitor at least once every four years following the procedure required by subsection (a). When an annual record taken in conformance with subsection (a) has established that the average annual concentration is less than half the MCLs established by Section 611.330, the Agency shall, by permit condition, substitute analysis of a single sample for the quarterly sampling procedure required by subsection (a).

1) The Agency shall, by permit condition, require more frequent monitoring in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water.

2) A CWS shall monitor in conformance with subsection (a) for one year after the introduction of a new water source. The Agency shall, by permit condition, require more frequent monitoring in the event of possible contamination or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in finished water.

3) The Agency shall, by permit condition, require a CWS using two or more sources having different concentrations of radioactivity to monitor source water, in addition to water from a free-flowing tap.

4) The Agency shall not require monitoring for radium-228 to determine compliance with Section 611.330 after the initial period; provided, that the average annual concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by subsection (a).

5) The Agency shall require the CWS to conduct annual monitoring if the radium-226 concentration exceeds 3 pCi/L.

d) If the average annual MCL for gross alpha particle activity or total

radium as set forth in Section 611.330 is exceeded, the CWS shall give notice to the Agency and notify the public as required by Subpart T. Monitoring at quarterly intervals must be continued until the annual average concentration no longer exceeds the MCL or until a monitoring schedule as a condition to a variance, adjusted standard or enforcement action becomes effective.

BOARD NOTE: Derived from 40 CFR 141.26(a) (1987).

Section 611.732 Manmade Radioactivity

Monitoring requirements for manmade radioactivity in CWSs are as follows:

a) CWSs using surface water sources and serving more than 100,000 persons and such other CWSs as the Agency by permit condition requires must monitor for compliance with Section 611.331 by analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. Compliance with Section 611.331 is assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/L and if the average annual concentrations of tritium and strontium-90 are less than those listed in Section 611.331; provided, that if both radionuclides are present the sum of their annual does equivalents to bone marrow must not exceed 4 millirem/year.

1) If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses must be calculated to determine compliance with Section 611.331.

2) If the MCLs are exceeded, the Agency shall require the CWS to conduct additional monitoring to determine the concentration of man-made radioactivity in principal watersheds.

3) The Agency may, by permit condition, require suppliers of water utilizing only groundwater to monitor for man-made radioactivity.

c) CWSs shall monitor at least every four years following the procedure in subsection (a).

d) The Agency shall, by permit condition, require any CWS utilizing waters contaminated by effluents from nuclear facilities to initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90 and tritium.

1) Quarterly monitoring for gross beta particle activity must be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/L, the same or an equivalent sample must be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/L, an analysis of the sample must be performed to identify the major radioactive

constitutents present and the appropriate organ and total body doses must be calculated to determine compliance with Section 611.331.

2) For iodine-131, a composite of five consecutive daily samples must be analyzed once each quarter. The Agency shall, by permit condition, require more frequent monitoring when iodine-131 is identified in the finished water.

3) The Agency shall, by permit condition, require annual monitoring for strontium-90 and tritium by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples.

4) The Agency shall, by permit condition, allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of manmade radioactivity by the CWS where the Agency determines such data is applicable to the CWS.

e) If the average annual MCL for man-made radioactivity set forth in Section 611.331 is exceeded, the operator of a CWS shall give notice to the Agency and to the public as required by Subpart T. Monitoring at monthly intervals must be continued until the concentration no longer exceeds the MCL or until a monitoring schedule as a condition to a variance, adjusted standard or enforcement action becomes effective.

BOARD NOTE: Derived from 40 CFR 141.26(b) (1987).

SUBPART T: REPORTING, PUBLIC NOTIFICATION AND RECORDKEEPING

Section 611.830 Applicability

Except as otherwise provided, this Subpart applies to violations of both identical in substance regulations and additional State requirements.

Section 611.831 Monthly Operating Report

Within 30 days following the last day of the month, each PWS shall submit a monthly operating report to the Agency, on forms provided or approved by the Agency.

BOARD NOTE: This is an additional State requirement.

Section 611.832 Notice by Agency

The Agency may give the public notices required in this Part on behalf of the PWS. However, the PWS remains responsible for ensuring that the requirements of this Part are met.

BOARD NOTE: Drawn from 40 CFR 141.32(g) and 141.34(a)(1) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.833 Cross Connection Reporting

Each CWS exempted pursuant to Section 17(b) of the Act from the disinfection requirement shall report monthly to the Agency its activity to educate and inform its customers about preventing contamination into the distribution system.

BOARD NOTE: This is an additional State requirement.

Section 611.840 Reporting

a) Except where a shorter period is specified in this Part, a PWS shall report to the Agency the results of any test measurement or analysis required by this Part within the following times, whichever is shortest:

1) The first ten days following the month in which the result is received; or

2) The first ten days following the end of the required monitoring period, as specified by permit condition.

b) Except where a different reporting period is specified in this Part, the PWS shall report to the Agency within 48 hours: The failure to comply with any provision (including failure to comply with monitoring requirements) in this Part.

c) The PWS is not required to report analytical results to the Agency in cases where an Agency laboratory performs the analysis.

d) The PWS, within ten days of completion of each public notification required pursuant to Section 611.851 et seq., shall submit to the Agency a representative copy of each type of notice distributed, published, posted or made available to the persons served by the PWS or to the media.

e) The PWS shall submit to the Agency within the time stated in the request copies of any records required to be maintained under Section 611.860 or copies of any documents then in existence which the Agency is entitled to inspect pursuant to the authority of Section 4 of the Act.

BOARD NOTE: Derived from 40 CFR 141.31 (1987), as amended at 54 Fed. Reg. 27562, June 29, 1989.

Section 611.851 Reporting MCL and other Violations

A PWS which fails to comply with an applicable MCL or treatment technique established by this Part or which fails to comply with the requirements of any schedule prescribed pursuant to a variance or adjusted standard shall notify persons served by the PWS as follows:

a) Except as provided in subsection (c), the PWS shall give notice:

1) By publication in a daily newspaper of general circulation in the area served by the PWS as soon as possible, but in no case later than 14 days after the violation or failure. If the area served by a PWS is not served by a daily newspaper of general circulation, notice must instead be given by publication in a weekly newspaper of general circulation serving the area; and

2) By mail delivery (by direct mail or with the water bill), or by hand delivery, not later than 45 days after the violation or failure. This is not required if the Agency determines that the PWS in violation has corrected the violation or failure within the 45-day period; and

3) For violations of the MCLs of contaminants that pose an acute risk to human health, by furnishing a copy of the notice to the radio and television stations serving the area served by the PWS as soon as possible but in no case later than 72 hours after the violation. The following violations are acute violations:

   A) Any violations posing an acute risk to human health, as specified in this Part or as determined by the Agency on a case-by-case basis.

   B) Violation of the MCL for nitrate in Section 611.300(b).

   C) Violation of the MCL for total coliforms, when fecal coliforms or E. coli are present in the water distribution system, as specified in Section 611.360(b).

4) Occurrence of a waterborne disease outbreak, as defined in Section 611.101, in an unfiltered system subject to the requirements of Subpart B, after December 30, 1991 (see Section 611.132(d).

b) Except as provided in subsection (c), following the initial notice given under subsection (a), the PWS shall give notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation or failure exists.

c) Alternative methods of notice.

1) In lieu of the requirements of subsections (a) and (b), a CWS in an area that is not served by a daily or weekly newspaper of general circulation shall give notice by hand delivery or by continuous posting in conspicuous places within the area served by the CWS. Notice by hand delivery or posting must begin as soon as possible, but no later than 72 hours after the violation or failure for acute violations (as defined in subsection (a)(3)) or 14 days after the violation or failure (for any other violation). Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

2) In lieu of the requirements of subsections (a) and (b), a non-CWS may give notice by hand delivery or by continuous posting in conspicuous places within the area served by the CWS. Notice by hand delivery or posting must begin as soon as possible, but no later than 72 hours after the violation or failure for acute violations (as defined in subsection (a)(3)), or 14 days after the violation or failure (for any other violation). Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

BOARD NOTE: Derived from 40 CFR 141.32(a) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987. at 54 Fed Reg. 15188, April 17, 1989, and at 54 Fed. Reg. 27526,June 29, 1989, and at 54 Fed. Reg. 27562,June 29, 1989.

Section 611.852 Reporting other Violations

A PWS which fails to perform monitoring required by this Part, fails to comply with a testing procedure established by this Part, or is subject to a variance or adjusted standard under Section 611.111, 611.112 or 611.113 shall notify persons served by the PWS as follows:

a) Except as provided in subsection (c) or (d), the PWS shall give notice, within three months of the violation or granting of a variance or adjusted standard, by publication in a daily newspaper of general circulation in the area served by the PWS. If the area served by a PWS is not served by a daily newspaper of general circulation, notice must instead be given by publication in a weekly newspaper of general circulation serving the area.

b) Except as provided in subsection (c) or (d), following the initial notice given under subsection (a), the PWS must give notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists. Repeat notice of the existence of a variance or adjusted standard must be given every three months for as long as the variance or adjusted standard remains in effect.

c) Alternative methods of notice.

1) In lieu of the requirements of subsections (a) and (b), a CWS in an area that is not served by a daily or weekly newspaper of general circulation shall give notice, within three months of the violation or granting of the variance or adjusted standard, by hand delivery or by continuous posting in conspicuous places with the area served by the CWS. Posting must continue for as long as the violation exists or a variance or adjusted standard remains in effect.

2) In lieu of the requirements of subsections (a) and (b), a non-CWS may give notice, within three months of the violation or the granting of the variance or adjusted standard, by hand delivery

or by continuous posting in conspicuous places within the area served by the PWS. Posting must continue for as long as the violation exists, or a variance or adjusted standard remains in effect. Notice by hand delivery must be repeated at least every three months for as long as the violation exists or a variance or adjusted standard remains in effect.

d) The Agency may, by permit condition, provide less frequent notice for minor monitoring violations. Notice of such violations must be given no less frequently than annually.

BOARD NOTE: Derived from 40 CFR 141.32(b) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.853 Notice to New Billing Units

A CWS shall give a copy of the most recent public notice for any outstanding violation of any MCL, treatment technique requirement or variance or adjusted standard schedule to all new billing units or new hookups prior to or at the time service begins.

BOARD NOTE: Derived from 40 CFR 141.32(c) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.854 General Content of Public Notice

Each notice required by this Section must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the PWS is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected. Each notice must be conspicuous and must not contain unduly technical language, unduly small print or similar problems that frustrate the purpose of the notice. Each notice must include the telephone number of the owner, operator or designee of the PWS as a source of additional information concerning the notice. Where appropriate, the notice must be multi-lingual.

BOARD NOTE: Derived from 40 CFR 141.32(d) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.855 Mandatory Health Effects Language

When providing the information on potential adverse health effects required by Section 611.853(b) in notices of violations of MCLs or treatment technique requirements, or notices of the granting or the continued existence of adjusted standards or variances, or notices of failure to comply with a variance or adjusted standard schedule, the PWS shall include the language specified in Appendix A for each contaminant. (If language for a particular contaminant is not specified at the time notice is required, this Section does not apply).

BOARD NOTE: Derived from 40 CFR 141.32(e) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987, and at 54 Fed. Reg. 27526, June 29, 1989, and at 54 Fed. Reg. 27562, June 29, 1988.

Section 611.856 Fluoride Notice

Public notices for fluoride. Notice of violations of the MCL for fluoride, notices of variances and adjusted standards from the MCL for fluoride and notices of failure to comply with variance and adjusted standard schedules for the MCL for fluoride must consist of the public notice prescribed Appendix A plus a description of any steps which the PWS is taking to come into compliance.

BOARD NOTE: Derived from 40 CFR 141.32(f) and (g) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.860 Record Maintenance

A PWS shall retain on its premises or at a convenient location near its premises the following records:

a) Records of bacteriological analyses made pursuant to this Part must be kept for not less than 5 years. Records of chemical analyses made pursuant to this Part must be kept for not less than 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided that the following information is included:

1) The date, place and time of sampling, and the name of the person who collected the sample;

2) Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;

3) Date of analysis;

4) Laboratory and person responsible for performing analysis;

5) The analytical technique or method used; and

6) The results of the analysis.

b) Records of action taken by the PWS to correct violations of this Part must be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

c) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the PWS itself, by a private consultant, by USEPA, the Agency or a unit of local government delegated pursuant to Section 611.108, must be kept for a period not less than 10 years after completion of the sanitary survey involved.

d) Records concerning a variance or adjusted standard granted to the PWS must be kept for a period ending not less than 5 years following the expiration of such variance or adjusted standard.

BOARD NOTE: Derived from 40 CFR 141.33 (1987).

Section 611.861 Lead Notice

a) Applicability of public notice requirement.

1) Except as provided in subsection (a)(2) each CWS and each NTNCWS shall issue notice to persons served by the PWS that may be affected by lead contamination of their drinking water. The PWS shall provide notice under this Section even if there is no violation of the MCL for lead.

2) Notice under subsection (a)(1) is not required if the PWS demonstrates to the Agency that the water system, including the residential and non-residential portions connected to the water system, are lead free. For the purposes of this subsection, the term "lead free" when used with respect to solders and flux refers to solders and flux containing not more than 0.2 percent lead, and when used with respect to pipes and pipe fittings refers to pipes and pipe fittings containing not more than 8.0 percent lead.

3) The PWS shall give notice by June 19, 1990. Notice in compliance with 40 CFR 141.34 is sufficient.

b) Manner of notice. Notice must be given to persons served by the PWS either by:

1) Three newspaper notices (one for each of three consecutive months and the first no later than June 19, 1990); or

2) Once by mail notice with the water bill or in a separate mailing by June 19, 1990; or

3) Once by hand delivery by June 19, 1990. For NTNCWSs, notice may be given by continuous posting. If posting is used, the notice must be posted in a conspicuous place in the area served by the PWS, and start no later than June 19, 1990 and continue for three months.

BOARD NOTE: Derived from 40 CFR 141.34(a) and (b) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.863 Content of Lead Notice

a) Notices issued under this Section must provide a clear and readily understandable explanation of the potential sources of lead in drinking water, potential adverse health effects, resonably available methods of mitigating known or potential lead content in drinking water, any steps the PWS is taking to mitigate lead content in drinking water, and the necessity for seeking alternative water supplies, if any. Use of the mandatory language in Section 611.864 in the notice will be sufficient to explain potential adverse health effects.

b) Each notice must also include specific advice on how to determine of materials containing lead have been used in homes or the water distribution system and how to minimize exposure to water likely to contain high levels of lead. Each notice must be conspicuous and must not contain unduly technical language, unduly small print or similar problems that frustrate the purpose of the notice. Each notice must contain the telephone number of the owner, operator or designee of the PWS as a source of additional information regarding the notice. Where appropriate, the notice must be multilingual.

BOARD NOTE: (Optional Information): Each notice should advise persons served by the PWS to use only the cold water faucet for drinking and for use in cooking or preparing baby formula, and to run the water until it gets as cold as it is going to get before each use. If there has recently been major water use in the household, such as showering or bathing, flushing toilets or doing laundry with cold water, flushing the pipes should take 5 to 30 seconds; if not, flushing the pipes could take as long as several minutes. Each notice should also advise persons served by the PWS to check to see if lead pipes, solder or flux have been used in plumbing that provides tap water and to ensure that new plumbing and plumbing repairs use lead-free materials. The only way to be sure of the amount of lead in the household water is to have the water tested by a competent laboratory. Testing is especially important to apartment dwellers because flushing may not be effective in high-rise buildings that have lead-soldered central piping. As appropriate, the notice should provide information on testing.

BOARD NOTE: Derived from 40 CFR 141.34(c) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.864 Mandatory Health Effects Information for Lead

Mandatory health effects information. When providing the information in public notices required under Section 611.863 on the potential adverse health effects of lead in drinking water, the PWS shall include the specific language of Appendix A in the notice.

BOARD NOTE: Derived from 40 CFR 141.34(d) through (f) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611.870 Unregulated Contaminants

a) This Section applies to only the contaminants listed in Section 611.650.

b) A CWS or NTNCWS who is required to monitor under Section 611.650 shall send a copy of the results of such monitoring within 30 days of receipt and any public notice under subsection (d) to the Agency.

d) The PWS shall notify persons served by the PWS of the availability of the results of sampling conducted under Section 611.650 by including a notice in the first set of water bills issued by the PWS after the

receipt of the results or written notice within three months. The notice must identify a person and supply the telephone number to contact for information on the monitoring results. For surface water systems, public notification is required only after the first quarter's monitoring and must include a statement that additional monitoring will be conducted for three more quarters with the results available upon request.

BOARD NOTE: Derived from 40 CFR 141.35 (1987), as amended at 52 Fed. Reg. 25712, July 8, 1987.

Section 611.Appendix A Mandatory Health Effects Information

1) Trichloroethylene. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that trichloroethylene is a health concern at certain levels of exposure. this chemical is a common metal cleaning and dry cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown ot cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. USEPA has set forth the enforceable drinking water standard for trichloroethylene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

2) Carbon tetrachloride. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that carbon tetrachloride is a health concern at certain levels of exposure. This chemical was once a popular household cleaning fluid. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for carbon tetrachloride at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

3) 1,2-Dichloroethane. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that 1,2-dichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaning fluid for fats, oils, waxes and resins. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause cancer in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who

are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for 1,2-dichloroethane at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

4) Vinyl chloride. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that vinyl chloride is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents are used as cleaners and degreasers of metals and generally get into drinking water by improper waste disposal. This chemical has has been associated with significantly increased risks of cancer among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for vinyl chloride at 0.002 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

5) Benzene. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that benzene is a health concern at certain levels of exposure. This chemical is used as a solvent and degreaser of metals. It is also a major component of gasoline. Dringking water contamination generally results from leaking underground gasoline and petroleum tanks or improper waste disposal. This chemical has been associated with significantly increased risks of leukemia among certain industrial workers who were exposed to relatively large amounts of this chemical during their working careers. This chemical has also been shown to This chemical has been shown to cause cancer in laboratory animals when the animals are exposed at high levels over their lifetimes. Chemicals that cause increased risk of cancer among exposed industrial workers and in laboratory animals also may increase the risk of cancer in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for benzene at 0.005 parts per million (ppm) to reduce the risk of cancer or other adverse health effects which have been observed in humans and laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

6) 1,1-Dichloroethylene. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that 1,1-dichloroethylene is a health concern at certain levels of exposure. This chemical is used in industry and is found in drinking water as a result of the breakdown of related solvents. The solvents

are used as cleaners and degreasers of metals and generally into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals that cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for 1,1-dichloroethylene at 0.007 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

7) Para-dichlorobenzene. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that para-dichlorobenzene is a health concern at certain levels of exposure. This chemical is a component of deodorizers, moth balls and pesticides. It generally gets into drinking water by improper waste disposal. This chemical has been shown to cause liver and kidney damage in laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Chemicals which cause adverse effects in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for para-dichlorobenzene at 0.075 parts per million (ppm) to reduce the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

8) 1,1,1-Trichloroethane. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that 1,1,1-trichloroethane is a health concern at certain levels of exposure. This chemical is used as a cleaner and degreaser of metals. It generally gets into drinking water by improper waste disposal. This chemical has been shown to damage the liver, nervous system and circulatory system of laboratory animals such as rats and mice when the animals are exposed at high levels over their lifetimes. Sime industrial workers who were exposed to relatively large amounts of this chemical during their working careers also suffered damage to the liver, nervous system and circulatory system. Chemicals which cause adverse effects among exposed industrial workers and in laboratory animals also may cause adverse health effects in humans who are exposed at lower levels over long periods of time. USEPA has set the enforceable drinking water standard for 1,1,1-trichloroethane at 0.2 parts per million (ppm) to protect against the risk of these adverse health effects which have been observed in laboratory animals. Drinking water which meets this standard is associated with little to none of this risk and should be considered safe.

BOARD NOTE: Derived from 40 CFR 141.32(e) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987,and at 54 Fed. Reg. 27526, June 29, 1989, and at 54 Fed. Reg. 27562, June 29, 1989.

9) Fluoride. The U.S. Environmental Protection Agency requires that we send you this notice on the level of fluoride in your drinking water. The drinking water in your community has a fluoride concentration of milligrams per liter (mg/L).

Federal regulations require that fluoride, which occurs naturally in your water supply, not exceed a concentration of 4.0 mg/L in drinking water. This is an enforceable standard called a Maximum Contaminant Level (MCL), and it has been established to protect the public health. Exposure to drinking water levels above 4.0 mg/L for many years may result in some cases of crippling skeletal fluorosis, which is a serious bone disorder.

Federal law also requires that we notify you when monitoring indicates that the fluoride in your drinking water exceeds 2.0 mg/L. This is intended to alert families about dental problems that might affect children under nine years of age. The fluoride concentration of your water exceeds this federal guideline.

Fluoride in children's drinking water at levels of approximately 1 mg/L reduces the number of dental cavities. However, some children exposed to levels of fluoride greater than about 2.0 mg/L may develop dental fluorosis. Dental fluorosis, in its moderate and severe forms, is a brown staining and/or pitting of the permanent teeth.

Because dental fluorosis occurs only when developing teeth (before they erupt from the gums) are exposed to elevated fluoride levels, households without children are not expected to be affected by this level of fluoride. Families with children under the age of nine are encouraged to seek other sources of drinking water for their children to avoid the possibility of staining and pitting.

Your water supplier can lower the concentration of fluoride in your water so that you will still receive the benefits of cavity prevention while the possibility of stained and pitted teeth is minimized. Removal of fluoride may increase your water costs. Treatment systems are also commercially available for home use. Information on such systems is available at the address given below. Low fluoride bottled drinking water that would meet all standards is also commercially available.

For further information, contact at your water system.

BOARD NOTE: Derived from 40 CFR 143.5 (1987).

10) Microbiological contaminants (for use when there is a violation of the treatment technique requirements for filtration and disinfection in Subpart B). The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that the presence of microbiological contaminants are a health concern at certain levels of exposure. If water is inadequately treated, microbiological contaminants in that water may cause disease. Disease symptoms may include diarrhea, cramps, nausea and possibly

jaundice and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be cuased by a number of factors other than your drinking water. USEPA has set enforceable requirements for treating drinking water to reduce the risk of these adverse health effects. Treatment such as filtering and disinfecting the water removes or destroys microbiological contaminants. Drinking water which is treated to meet USEPA requirements is associated with little to none of this risk and should be considered safe.

11) Total coliforms. (To be used when there is a violation of Section 611.360(a) and not a violation of Section 611.360(b)). The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that the presence of total coliforms is a possible health concern. Total coliforms are common in the environment and are generally not harmful themselves. The presence of these bacteria in drinking water, however, generally is a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be ocntaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea and possibly jaundice, and any associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. USEPA has set an enforceable drinking water standard for total coliforms to reduce the risk of these adverse health effects. Under this standard, no more than 5.0 percent of the samples collected during a month can contain these bacteria, except that systems collecting fewer than 40 samples/month that have one total coliform-positive sample per month are not violating the standard. Drinking water which meets this standard is usually not associated with a health risk from disease-causing bacteria and should be considered safe.

12) Fecal Coliforms/E. coli. (To be used when there is a violation of Section 611.360(b) or both Section 611.360(a) and (b)). The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that the presence of fecal coliforms or E. coli is a serious health concern. Fecal coliforms and E. coli are generally not harmful themselves, but their presence in drinking water is serious because they usually are associated with sewage or animal wastes. The presence of these bacteria in drinking water is generally a result of a problem with water treatment or the pipes which distribute the water and indicates that the water may be ocntaminated with organisms that can cause disease. Disease symptoms may include diarrhea, cramps, nausea and possibly jaundice, and associated headaches and fatigue. These symptoms, however, are not just associated with disease-causing organisms in drinking water, but also may be caused by a number of factors other than your drinking water. USEPA has set an enforceable drinking water standard for fecal coliforms and E. coli to reduce the risk of these adverse health effects. Under this standard all drinking water samples must be free of these bacteria. Drinking water which meets this standard is associated with little or none of this risk and should be considered safe. State and local health authorities recommend that

consumers take the following precautions: [To be inserted by the public water system, according to instruction from State or local authorities].

BOARD NOTE: Derived from 40 CFR 141.32(e) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987,and at 54 Fed. Reg. 27526, June 29, 1989, and at 54 Fed. Reg. 27562, June 29, 1989.

13) Lead. The United States Environmental Protection Agency (USEPA) sets drinking water standards and has determined that lead is a health concern at certain levels of exposure. There is currently a standard of 0.050 parts per million (ppm). Based on new health informaiton, USEPA is likely to lower this standard significantly.

Part of the purpose of this notice is to inform you of the potential adverse health effects of lead. This is being done even though your water may not be in violation of the current standard.

USEPA and others are concerned about lead in drinking water. Too much lead in the human body can cause serious damage to the brain, kidneys, nervous system and red blood cells. The greatest risk, even with short-term exposure, is to young children and pregnant women.

Lead levels in your drinking water are likely to be highest:

If your home or water system has lead pipes, or

If your home has copper pipes with lead solder, adn

If the home is less than five years old, or

If you have soft or acidic water, or

If water sits in the pipes for several hours.

BOARD NOTE: Derived from 40 CFR 141.34(d) (1987), as amended at 52 Fed. Reg. 41546, October 28, 1987.

Section 611. Appendix B Percent Inactivation of G. Lamblia Cysts

TABLE 1.1
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 0.5 DEGREES C OR LOWER

These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual	pH						
(mg/L)	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0

<=0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	276	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	296	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

TABLE 1.2
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 5.0 DEGREES C

These CT values achieve greater than a 99.99 percent inctivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual				pH			
(mg/L)	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<=0.4	97	117	139	166	198	236	279
0.6	100	120	143	171	204	244	291
0.8	103	122	146	175	210	252	301
1.0	105	125	149	179	216	260	312
1.2	107	127	152	183	221	267	320
1.4	109	130	155	187	227	274	329
1.6	111	132	158	192	232	281	337
1.8	114	135	162	196	238	287	345
2.0	116	138	165	200	243	294	353
2.2	118	140	169	204	248	300	361
2.4	120	143	172	209	253	306	368
2.6	122	146	175	213	258	312	375
2.8	124	148	178	217	263	318	382
3.0	126	151	182	221	268	324	369

TABLE 1.3
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 10.0 DEGREES C

These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual (mg/L)	pH <=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<=0.4	73	88	104	125	149	177	209
0.6	75	90	107	128	153	183	210
0.8	78	92	110	131	158	189	220
1.0	79	94	112	134	162	195	234
1.2	80	95	114	137	166	200	240
1.4	82	98	116	140	170	206	247
1.6	83	99	119	144	174	211	253
1.8	86	101	122	147	179	215	259
2.0	87	104	124	150	182	221	265
2.2	89	105	127	153	186	225	271
2.4	90	107	129	157	190	230	276
2.6	92	110	131	160	194	234	281
2.8	93	111	134	163	197	239	287
3.0	95	113	137	166	201	243	292

TABLE 1.4
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 15.0 DEGREES C

These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual (mg/L)	pH <=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<=0.4	49	59	70	83	99	118	140
0.6	50	60	72	86	102	122	146
0.8	52	61	73	88	105	126	151
1.0	53	63	75	90	108	130	156
1.2	54	64	76	92	111	134	160
1.4	55	65	78	94	114	137	165
1.6	56	66	79	96	116	141	169
1.8	57	68	81	96	119	144	173
2.0	58	69	83	100	122	147	177
2.2	59	70	85	102	124	150	181
2.4	60	72	86	105	127	153	184
2.6	61	73	88	107	129	156	188
2.8	62	74	89	109	132	159	191
3.0	63	76	91	111	134	162	195

TABLE 1.5
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 20 DEGREES C

These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by

linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual	pH						
(mg/L)	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<=0.4	36	44	52	62	74	89	105
0.6	38	45	54	64	77	92	109
0.8	39	46	55	66	79	95	113
1.0	39	47	56	67	81	98	117
1.2	40	48	57	69	83	100	120
1.4	41	49	58	70	85	103	123
1.6	42	50	59	72	87	105	126
1.8	43	51	61	74	89	108	129
2.0	44	52	62	75	91	110	132
2.2	44	53	63	77	93	113	135
2.4	45	54	65	78	95	115	138
2.6	46	55	66	80	97	117	141
2.8	47	56	67	81	99	119	143
3.0	47	57	68	83	101	122	146

TABLE 1.6
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY FREE CHLORINE AT 25 DEGREES C AND HIGHER

These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT 99.9 value at the lower temperature and at the higher pH.

Free Residual	pH						
(mg/L)	<=6.0	6.5	7.0	7.5	8.0	8.5	<=9.0
<=0.4	24	29	35	42	50	59	70
0.6	25	30	36	43	51	61	73
0.8	26	31	37	44	53	63	75
1.0	26	31	37	45	54	65	78
1.2	27	32	38	46	55	67	80
1.4	27	33	39	47	57	69	82
1.6	28	33	40	48	58	70	84
1.8	29	34	41	49	60	72	86
2.0	29	35	41	50	61	74	88
2.2	30	35	42	51	62	75	90
2.4	30	36	43	52	63	77	92
2.6	31	37	44	53	65	78	94
2.8	31	37	45	54	66	80	96
3.0	32	38	46	55	67	81	97

TABLE 2.1
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS

BY CHLORINE DIOXIDE AND OZONE

	<=1°C	5°C	10°C	15°C	20°C	>25°C
Chlorine dioxide	63.	26.	23.	19.	15.	11.
Ozone	2.9	1.9	1.4	0.95	0.72	0.48

TABLE 3.1
CT-99.9 FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS
BY CHLORAMINES

	<=1°C	5°C	10°C	15°C	20°C	>25°C
Chloramines	3800.	2200.	1850.	1500.	1100.	750.

BOARD NOTE: Derived from 40 CFR 141.74(b) Tables, as adopted at 54 Fed. Reg. 27526, June 29, 1989.

Section 611.Appendix C Common Names of Organic Chemicals

The following common names are used for certain organic chemicals:

Common Name	CAS No.	CAS Name
Aldrin	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-
Bromoform	75-25-2	Methane, tribromo-
Chlordane	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
Chloroform	67-66-3	Methane, trichloro-
2,4-D	94-75-7	Acetic acid, 2,4-dichlorophenoxy-
DDT	50-29-3	Benzene, 1,1'-(2, 2, 2-trichloroethylidene)bis[4-chloro-
Dieldrin	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-
Endrin	72-20-8	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)-,
Heptachlor	76-44-8	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-

Heptachlor epoxide	1024-57-3	2, 5-Methano-2H-indeno[1, 2b]oxirene, 2, 3, 4, 5, 6, 7, 7-heptachloro-1a, 1b, 5, 5a, 6, 6a-hexahydro-, (1a alpha, 1b beta, 2 alpha, 5 alpha, 5a beta, 6beta, 6a alpha)-
Lindane	58-89-9	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1 alpha,2 alpha,3 beta,4 alpha,5 alpha,6 beta)-
Methoxychlor	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-
Silvex (2,4,5-TP)	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
Toxaphene	8001-35-2	Toxaphene
TTHM		Total trihalomethanes (See Section 611.101)

BOARD NOTE: Derived from 40 CFR 141.30 (1987), and 40 CFR 261, Appendix VIII (1989)