DEPARTMENT OF HEALTH

Amendment and Compilation of Chapter 11-20
Hawaii Administrative Rules

SEP 2 0 2011

SUMMARY

1. Title amended.

2. §11-20-2, §11-20-4 and §11-20-4.1 are amended.

3. §11-20-7 is amended.

4. §11-20-9 is amended.

5. §11-20-11 and §11-20-12 are amended.

6. §11-20-13 is repealed and replaced with new §11-20-13.1.

7. §11-20-13.1 is added.

8. §11-20-18 and §11-20-19 are amended.

9. §11-20-45 is repealed.

10. §11-20-45.1 is amended.

11. §11-20-45.2 and §11-20-45.3 are added.

12. §11-20-46 is amended

13. §11-20-46.2 is added

14. §11-20-48 is amended

15. §11-20-49 is repealed and replaced with new §11-20-100.

16. §11-20-100 is added

17. §11-20-50 to §11-20-100 are added and reserved

18. Appendices A & G are amended. Appendices I & J are added

19. Chapter 20 is compiled.

HAWAII ADMINISTRATIVE RULES

TITLE 11

DEPARTMENT OF HEALTH

CHAPTER 20

RULES RELATING TO PUBLIC WATER SYSTEMS

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§11-20-100	Severability clause

Historical Note: Chapter 11-20, is based substantially upon Chapter 49 of the Public Health Regulations, Department of Health. [Eff 8/16/77; R 12/26/81]

§11-20-1 Coverage. This chapter applies to each public water system, unless the public water system meets all of the following conditions:

(1) It consists only of distribution and storage facilities (and does not have any collection and treatment facilities);
(2) It obtains all of its water from, but is not owned or operated by, a public water system to which such rules apply;
(3) It does not sell water to any person; and
(4) It is not a carrier which conveys passengers in interstate commerce. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §142.10)

§11-20-2 Definitions. As used in this chapter:

"Act" means the Public Health Service Act, as amended by the Safe Drinking Water Act, P.L. 93-523, December 16, 1974, Safe Drinking Water Act Amendments of 1986, P.L. 99-339, June 19, 1986 and Safe Drinking Water Act Amendments of 1996, P.L. 104-182, August 6, 1996.

"Acute violation" means a violation of the maximum contaminant levels of contaminants that may pose an acute risk to human health. The following violations are acute violations:

(1) Violations determined by the director as posing an acute risk to human health.
(2) Violation of the MCL for nitrate or nitrite as provided in section 11-20-3 and determined according to section 11-20-11(i)(3).
(3) Violation of the MCL for total coliforms, as provided in section 11-20-6(b), and which occurs when a repeat sample is fecal coliform-positive or E. coli-positive, or a total coliform-positive repeat sample follows a fecal coliform-positive or E. coli-positive routine sample.

"Administrator" means the administrator of the United States Environmental Protection Agency, or authorized representative.

"Bag filters" are pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to outside.

"Best available technology" or "BAT" means the best technology, treatment techniques, or other means which the director finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration). For the purposes of setting MCLs for synthetic organic chemicals, any BAT shall be at least as effective as granular activated carbon.

"Capacity" means the overall capability of a water system to consistently produce and deliver water meeting all national and state primary drinking water regulations in effect or likely to be in effect when new or modified operations begin. Capacity includes the technical, managerial, and financial capacities of the water system to plan for, achieve, and maintain compliance with applicable national and state primary drinking water regulations.

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

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

"Code of Federal Regulations" or "C.F.R." means the official codification of Federal regulations, as previously published in the Federal Register by the Executive departments and agencies of the Federal Government. The effective revision date of the C.F.R. references in this chapter is July 1, 2009.

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

"Community water system" means a public water system which serves at least fifteen service connections used by year-round residents or regularly serves at least twenty-five year-round residents.

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

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

"Composite Correction Program" or "CCP" consists of a Comprehensive Performance Evaluation (CPE) and Comprehensive Technical Assistance (CTA), both performed by a state-approved third party.

"Comprehensive Performance Evaluation" or "CPE" means a thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation, and maintenance practices. It is conducted by a state-approved third party to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. The CPE must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance (CTA); and preparation of a CPE report.

"Comprehensive Technical Assistance" or "CTA" means the performance improvement phase that is implemented if CPE results indicate improved performance potential. During the CTA phase, the system must identify and systematically address plant-specific factors. The CTA is a combination of utilizing CPE results as a basis for follow up, implementing process control priority-setting techniques, and maintaining long-term involvement to systematically train staff and administrators.

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

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

"Contaminant" means any physical, chemical, biological, or radiological substance or matter in water. An additive contaminant under this definition may have a beneficial or a detrimental effect on the potability of the water.

"Conventional filtration treatment" means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal. "CT" or "CTcalc" is the product of "residual disinfectant concentration" (C) in milligrams per liter or mg/l determined before or at the first customer, and the corresponding "disinfectant contact time" (T) in minutes, i.e., "C" x "T". If a public water system applies disinfectants at more than one point prior to the first customer, it shall determine the CT of each disinfectant sequence before or at the first customer to determine the total per cent inactivation or "total inactivation ratio." In determining the total inactivation ratio, the supplier shall determine the residual disinfectant concentration of each disinfection sequence and corresponding contact time before any subsequent disinfection application point(s).

"$CT_{99.9}$" means the CT value required for 99.9 per cent (3-log) inactivation of Giardia lamblia cysts.

"CT inactivation ratio" means $(CTcalc)/(CT_{99.9})$. The sum of the inactivation ratios, or total inactivation ratio shown as $(CTcalc)/(CT_{99.9})$ is calculated by adding together the inactivation ratio for each disinfection sequence. A total inactivation ratio equal to or greater than 1.0 is assumed to provide a 3-log inactivation of Giardia lamblia cysts.

"Department" means the department of health, State of Hawaii.

"Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which (1) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (2) while the water is filtered by passing through the cake on the

septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

"Direct additives" means contaminants added to water in the protection of drinking water.

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

"Director" means the director of the Hawaii state department of health or the director's authorized agent.

"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 residual disinfectant concentration ("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 the point where residual disinfectant concentration ("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 shall 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 shall be determined by tracer studies or an equivalent demonstration.

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

"Disinfection profile" means a summary of daily Giardia lamblia inactivation through the treatment plant.

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

"Dose equivalent" means the product of the absorbed dose from ionizing radiation and such factors as account

for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

"Dual sample set" is a set of two samples collected at the same time and same location, with one sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an IDSE under section 11-20-45.2 and determining compliance with the TTHM and HAA5 MCLs under section 11-20-45.3.

"Enhanced coagulation" means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

"Enhanced softening" means the improved removal of disinfection byproduct precursors by precipitative softening.

"Fecal coliform" means part of the total coliform group that are gram negative, non-spore forming rods that ferment lactose in 24 ± 2 hours at 44.5 ± 0.2 degrees Centigrade with the production of gas.

"Federal Register" or "F.R." means the official daily publication for rules, proposed rules, and notices of Federal agencies and organizations, as well as executive orders and other presidential documents by the National Archives and Records Administration (NARA). The revisions to this chapter include the applicable Federal Register changes to Title 40 Code of Federal Regulations Part 141 and Part 142 through November 14, 2008.

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

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

"Financial capacity" refers to the financial resources of the water system, including an adequate budget, adequate fiscal controls, and creditworthiness.

"Finished water" is water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster

disinfection, addition of corrosion control chemicals).

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

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

"Granular activated carbon" or "GAC" consists of fine carbon particles placed in pressure filters to adsorb the organics in the water.

"GAC10" means granular activated carbon filter beds with an empty-bed contact time of ten minutes based on average daily flow and a carbon reactivation frequency of every one hundred eighty days except that the reactivation frequency for GAC10 used as a best available technology for compliance with MCLs under section 11-20-4.1(b)(2)(A) shall be 120 days.

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

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

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

"Ground water under the direct influence of surface water" (GWUDI) means any water beneath the surface of the ground with:

(1) Significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as Giardia lamblia, or Cryptosporidium; or

(2) Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions.

Direct influence shall be determined for individual sources in accordance with criteria established by the director. The director's determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction

characteristics and geology with field evaluation.

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

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

"Heterotrophic bacteria" means a broad class of aerobic and facultative anaerobic organisms which use organic nutrients for growth. The group includes many innocuous bacteria as well as virtually all of the bacteria pathogens and those bacteria infect when the host defenses are weakened.

"Heterotrophic plate count" or "HPC" means the number of heterotrophic bacteria contained in a water sample.

"Indirect additives" means contaminants that are introduced into drinking water through contact with surfaces of material or products used for its treatment, storage, transmission, or distribution.

"Initial compliance period" means the first full three-year compliance period which begins at least eighteen months after federal promulgation. For the Phase V contaminants listed in section 11-20-4(d)(20)-(22), section 11-20-4(e)(19)-(33), and section 11-20-3(b)(11)-(15), the initial compliance period for systems with 150 or more service connections is January 1993-December 1995 (the first full three-year compliance period after July 17, 1992), and for systems having fewer than 150 service connections, the initial compliance period is January 1996-December 1998 (the first full three-year compliance period after January 17, 1994).

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

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

"Locational running annual average (LRAA)" is the average of sample analytical results for samples taken at

a particular monitoring location during the previous four calendar quarters.

"Managerial capacity" refers to the ability of the water system to manage itself, including clear ownership, organization, and communications, and accountability; adequate management, staffing, policies, training, and information management; and effective relationships with customers and regulatory agencies.

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

"Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

"Maximum contaminant level goal" or "MCLG" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health or persons would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non-enforceable health goals.

"Maximum residual disinfectant level" or "MRDL" means a level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a PWS is in compliance with the MRDL when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or equal to the MRDL. For chlorine dioxide, a PWS is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels under Section 1412 of the Safe Drinking Water Act.

"Maximum residual disinfectant level goal" or "MRDLG" means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an

adequate margin of safety. MRDLGs are non-enforceable health goals and do not reflect the benefit of the addition of a chemical for control of waterborne microbial contaminants.

"Maximum total trihalomethane potential" or "MTTHMP" means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25 degrees Centigrade or above.

"Membrane filtration" is a pressure or vacuum driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

"Near the first service connection" means at one of the twenty per cent 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.

"Non-community water system" means a public water system that is not a community water system.

"Non-transient non-community water system" or "NTNCWS" means a public water system that is not a community water system and that regularly serves at least twenty-five of the same persons over six months per year.

"Packed tower aeration" or "PTA" consists of high-surface area packing material supported and contained in a cylindrical shell. Water flow is normally downward through the packing material with either forced draft or induced draft upward airflow.

"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 EPA. The limits of performance for inorganic samples are defined in 40 C.F.R. §141.23(k)(3)(ii), for volatile organic chemicals are defined in 40 C.F.R. §141.24(f)(17)(i), and for synthetic organic chemicals are

defined in 40 C.F.R. §141.24(h)(19)(i)(B). The true value of the concentration of the reference material is unknown to the laboratory at the time of the analysis.

"Person" means an individual, corporation, company, association, partnership, county, municipality; or state, federal, or tribal agency.

"Picocurie" or "pCi" means that quantity of radioactive material producing 2.22 nuclear transformations per minute. "pCi/l" is a symbol for picocurie per liter.

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

"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.

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

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

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

"Public water system" means a system which provides water for human consumption, through pipes or other constructed conveyances if the system has at least fifteen service connections or regularly serves an average of at least twenty-five individuals daily at least sixty days out of the year. Such term includes (1) any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system, and (2) any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system.

A public water system may be privately or publicly owned or operated. A public water system is a "community water system" or a "non-community water system".

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

"Repeat compliance period" means any subsequent compliance period after the initial compliance period.

"Residual disinfectant concentration" ("C" in CT calculations) means the concentration of disinfectant measured in milligrams per liter or mg/l in a representative sample of water.

"Sanitary survey" means an on-site review of the water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water.

"Secondary maximum contaminant levels" or "SMCLS" means the maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of the public water system.

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

"Slow sand filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 meters per hour or 1.2 feet per hour) resulting in substantial particulate removal by physical and biological mechanisms.

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

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

"State" means the Hawaii state department of health.

"Subpart H systems" means public water systems using surface water or ground water under the direct influence of surface water as a source that are subject to 40 C.F.R.

Part 141 Subpart H.

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

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

"Surface water treatment rule administrative manual" is a separate document adopted as part of this chapter and, as such, has the effect of law in the uniform enforcement of this chapter.

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

"Technical capacity" refers to the physical infrastructure of the water system, including but not limited to the adequacy of the water source(s), treatment, storage, and distribution systems, and the ability of system personnel to adequately operate and maintain the system and to otherwise implement technical knowledge.

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

"Total coliform" means all aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within forty- eight hours at 35 degrees Centigrade or hydrolyzes OMPG to form a yellow color.

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

"Total trihalomethanes" or "TTHM" means the sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane (chloroform), dibromochloromethane, bromodichloromethane, and tribromomethane (bromoform)), rounded to two significant figures.

"Transient non-community water system" or "TWS" means a non-community water system that does not regularly serve at least twenty-five of the same persons over six months per year.

"Treatment technique requirement" means a requirement of the state primary drinking water rules which specifies for a contaminant a specific treatment technique(s) known to the director which leads to a reduction in the level of such contaminant sufficient to comply with the requirements of this chapter.

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

"Turbidity" means suspended material such as clay, silt, finely divided organic material, or other inorganic material in water. Turbidity is measured in nephelometric turbidity units (NTU).

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

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

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

"Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the director.

"Wholesale system" is a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-2.5, 340E-9) (Imp: HRS §§340E-2, 340E-2.5, 340E-9; 42 U.S.C. §§300g-1, 300g-2,

300g-3, 300g-9, 300j-4, 300g-b, 300j-9; 40 C.F.R. Parts 141, 142, §141.2, §142.10)

§11-20-3 Maximum contaminant levels for inorganic chemicals. (a) The MCL for nitrate, nitrite, and total nitrate and nitrite is applicable to all public water systems except as provided by subsection (d) and (e). The MCL for fluoride apply only to community water systems. The MCLs for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, mercury, selenium, and thallium apply to community water systems and non-transient non-community water systems. Compliance with MCLs for inorganic chemicals is calculated pursuant to section 11-20-11.

(b) The following are the MCLs for inorganic chemicals:

Contaminant	MCL, Milligrams Per Liter (mg/L)	Chemical Abstract Source Registry Number (CAS #)
(1)Arsenic	0.01	7440-38-2
(2)Asbestos	7 million fibers/liter(longer than 10 µm)	
(3)Barium	2	7440-39-3
(4)Cadmium	0.005	7440-43-9
(5)Chromium	0.1	7440-47-3
(6)Mercury	0.002	7439-97-6
(7)Nitrate	10 (as Nitrogen)	14797-55-8
(8)Nitrite	1 (as Nitrogen)	
(9)Total Nitrate and Nitrite	10 (as Nitrogen)	
(10)Selenium	0.05	7882-49-2
(11)Antimony	0.006	7440-36-0
(12)Beryllium	0.004	7440-41-7
(13)Cyanide	0.2 (as free Cyanide)	
(14)(reserved)		
(15)Thallium	0.002	7440-28-0
(16)Fluoride	4.0	16984-48-8

The MCL of 0.01 mg/l for arsenic is effective January 23, 2006. Prior to January 23, 2006, the MCL for arsenic is 0.05 mg/L.

(c) At the discretion of the director, nitrate levels not to exceed twenty milligrams per liter or mg/l may be allowed in a non-community water system if the supplier of water demonstrates to the satisfaction of the director that:

(1) Such water will not be available to children under six months of age;

(2) The non-community water system is meeting the public notification requirements under section 11-20-18(i), including continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure;

(3) Local and state public health authorities will be notified annually of nitrate levels that exceed ten milligrams per liter or mg/l; and

(4) No adverse health effects shall result.

(d) The best available technologies (BATs) for treating inorganic chemicals to achieve compliance with their MCLs are found in 40 C.F.R. §141.62(c).

(e) Small system compliance technologies for the treatment of arsenic are identified in 40 C.F.R. 141.62(d) for systems serving 10,000 persons or fewer. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.11, §141.62, §142.10)

§11-20-4 Maximum contaminant levels for organic chemicals. The following are the MCLs for organic chemicals.

(a) (Reserved)

(b) (Reserved)

(c) (Reserved)

(d) The following MCLs for organic contaminants apply to community and non-transient, non-community water systems.

Contaminant	MCL(mg/L)	CAS. No.
(1) Benzene	0.005	71-43-2
(2) Carbon tetrachloride	0.005	56-23-5
(3) o-Dichlorobenzene	0.6	95-50-1
(4) para-Dichlorobenzene	0.075	106-46-7
(5) 1,2-Dichloroethane	0.005	107-06-2
(6) 1,1-Dichloroethylene	0.007	75-35-4
(7) cis-1,2-Dichloroethylene	0.07	156-59-2
(8) trans-1,2-Dichloroethylene	0.1	156-60-5
(9) 1,2-Dichloropropane (DCP)	0.005	78-87-5
(10) Ethylbenzene	0.7	100-41-4
(11) Monochlorobenzene	0.1	108-90-7
(12) Styrene	0.1	100-42-5
(13) Tetrachloroethylene	0.005	127-18-4
(14) Toluene	1	108-88-3
(15) 1,1,1-Trichloroethane	0.2	71-55-6
(16) Trichloroethylene	0.005	79-01-6
(17) 1,2,3-Trichloropropane(TCP)	0.0006	96-18-4
(18) Vinyl chloride	0.002	75-01-4
(19) Xylenes (total)	10	1330-20-7
(20) Dichloromethane	0.005	75-09-2
(21) 1,2,4-Trichlorobenzene	0.07	120-82-1
(22) 1,1,2-Trichloroethane	0.005	79-00-5

(e) The following MCLs for synthetic organic contaminants apply to community and non-transient, non-community water systems.

Contaminant	MCL(mg/l)	CAS No.
(1)Alachlor	0.002	15972-60-8
(2)(Reserved)		
(3)(Reserved)		
(4)(Reserved)		
(5)Atrazine	0.003	912-24-9
(6)Carbofuran	0.04	1563-66-2
(7)Chlordane	0.002	57-74-9
(8)Dibromochloropropane(DBCP)	0.00004	96-12-8
(9)2,4-D	0.07	94-75-7
(10)Ethylene dibromide(EDB)	0.00004	106-93-4
(11)Heptachlor	0.0004	76-44-8

(12)Heptachlor epoxide	0.0002	1024-57-3
(13)Lindane	0.0002	58-89-9
(14)Methoxychlor	0.04	72-43-5
(15)Polychlorinated biphenyls (PCB)	0.0005	1336-36-3
(16)Pentachlorophenol	0.001	87-86-5
(17)Toxaphene	0.003	8001-35-2
(18)2,4,5-TP (Silvex)	0.05	93-72-1
(19)Benzo[a]pyrene	0.0002	50-32-8
(20)Dalapon	0.2	75-99-0
(21)Di(2-ethylhexyl) adipate	0.4	103-23-1
(22)Di(2-ethylhexyl)phthalate	0.006	117-81-7
(23)Dinoseb	0.007	88-85-7
(24)Diquat	0.02	85-00-7
(25)Endothall	0.1	145-73-3
(26)Endrin	0.002	72-20-8
(27)Glyphosate	0.7	1071-53-6
(28)Hexachlorobenzene	0.001	118-74-1
(29)Hexachlorocyclopentadiene	0.05	77-47-4
(30)Oxamyl (Vydate)	0.2	3135-22-0
(31)Picloram	0.5	1918-02-1
(32)Simazine	0.004	122-34-9
(33)2,3,7,8-TCDD (Dioxin)	3×10^{-8}	1746-01-6

(f) The best available technologies (BATs), treatment techniques, or other means available for achieving compliance with the organic contaminant MCLs are identified as either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OX) in 40 C.F.R. §141.61(b). [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §142.10, §141.12, §141.61)

§11-20-4.1 Maximum contaminant levels for disinfection byproducts. (a) *Bromate and chlorite.* The maximum contaminant levels (MCLs) for bromate and chlorite are as follows:

Disinfection byproduct	MCL (mg/L)
Bromate	0.010
Chlorite	1.0

(1) *Compliance dates for CWSs and NTNCWSs.* Subpart H systems serving 10,000 or more persons must comply with this paragraph beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this paragraph beginning January 1, 2004.

(2) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for bromate and chlorite identified in this paragraph:

Disinfection byproduct	Best available technology
Bromate	Control of ozone treatment process to reduce production of bromate
Chlorite	Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels

(b) TTHM and HAA5.

(1) Section 11-20-45.1 RAA compliance.

(A) Compliance dates. Subpart H systems serving 10,000 or more persons must comply with this paragraph beginning January 1, 2002. Subpart H systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this paragraph beginning January 1, 2004. All systems must comply with these MCLs until the date specified in section 11-20-45.3(a)(3).

Disinfection byproduct	MCL(mg/L)
Total trihalomethanes(TTHM)	0.080
Haloacetic acids(five)(HAA5)	0.060

(B) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this paragraph: Enhanced coagulation or enhanced softening or GAC10 with chlorine as the primary and residual disinfectant.

(2) Stage 2 Disinfection Byproduct LRAA compliance.

(A) Compliance dates. The MCLs for TTHM and HAA5 must be complied with as a locational running annual average at each monitoring location beginning the date specified in section 11-20-45.3(c).

Disinfection byproduct	MCL(mg/L)
Total trihalomethanes(TTHM)	0.080
Haloacetic acids(five)(HAA5)	0.060

(B) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this paragraph for all systems that disinfect their source water: Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff ≤1000 Daltons; or GAC20.

(C) The Administrator, pursuant to section 1412 of the Act, hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for TTHM and HAA5 identified in this paragraph for consecutive systems and applies only to the disinfected water that consecutive systems buy or otherwise receive: Systems serving

>10,000: Improved distribution system and storage tank management to reduce residence time plus the use of chloramines for disinfectant residual maintenance. Systems serving <10,000: Improved distribution system and storage tank management to reduce residence time. [Eff and comp 11/30/02; comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.64)

§11-20-5 Maximum contaminant levels for turbidity.

(a) The MCLs for turbidity apply to all public water systems using surface water sources in whole or in part.

(b) The requirements in this subsection apply to filtered surface water systems until June 29, 1993. The requirements in this subsection apply to unfiltered systems until June 29, 1993, or until filtration is installed, whichever is later. The director shall determine, in writing pursuant to 42 U.S.C. §300g-1(b)(7)(C)(iii), which systems must install filtration. The MCLs measured at a representative entry point(s) to the distribution system, are:

(1) One turbidity unit, as determined by a monthly average pursuant to section 11-20-10 except that five or fewer turbidity units may be allowed if the supplier of water can demonstrate to the director that the higher turbidity does not do any of the following:
   (A) Interfere with disinfection;
   (B) Prevent maintenance of an effective disinfectant agent throughout the distribution system; or
   (C) Interfere with microbiological determinations.

(2) Five turbidity units based on an average for two consecutive days pursuant to section 11-20-10.

(c) The MCL for filtered water turbidity levels, after June 29, 1993, shall be less than or equal to the

applicable value in this subsection in ninety-five per cent of the measurements taken every month, and shall not exceed 5 nephelometric turbidity units or NTU at any time for the following filter units:

(1) Conventional treatment, direct filtration, and other filtration technologies, 0.5 nephelometric turbidity units or NTU; and

(2) Slow sand, and diatomaceous earth, 1.0 nephelometric turbidity units or NTU. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05;comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.13, §142.10)

§11-20-6 Maximum microbiological contaminant levels. (a) The MCL is based on the presence or absence of total coliforms in a sample, rather than coliform density.

(1) When at least forty samples per month are collected for a system, the system is in compliance with the MCL for total coliforms if no more than 5.0 per cent of the samples collected during a month are total coliform-positive.

(2) When fewer than forty samples per month are collected for a system, the system is in compliance with the MCL for total coliforms if no more than one sample collected during a month is total coliform-positive.

(b) Any fecal coliform-positive or E. coli-positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or E. coli-positive routine sample constitutes an acute violation of the MCL for total coliforms and is subject to the public notification requirements in section 11-20-18.

(c) A supplier of water 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) The director hereby identifies the following as the best technology, treatment techniques, or other means available 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 a disinfectant residual 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 or disinfection of ground water using strong oxidants such as chlorine, chlorine dioxide, or ozone; and

(5) The development and implementation of an EPA-approved State Wellhead Protection Program under section 1428 of the SDWA. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; am and comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9)(Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.63, §142.10)

§11-20-7 Maximum contaminant levels for radionuclides.

(a) Reserved.

(b) MCL for combined radium-226 and -228. The maximum contaminant level for combined radium-226 and radium-228 is 5 pCi/L. The combined radium-226 and radium-228 value is determined by the addition of the

results of the analysis for radium-226 and the analysis for radium-228.

(c) MCL for gross alpha particle activity (excluding radon and uranium). The maximum contaminant level for gross alpha particle activity (including radium-226 but excluding radon and uranium) is 15 pCi/L.

(d) MCL for beta particle and photon radioactivity.

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

(2) Except for the radionculides listed in table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of 2 liter per day drinking water intake using the 168 hour data list in "Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure." NBS (National Bureau of Standards) Handbook 69 as amended August 1963. U.S. Department of Commerce. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of this document are available from the National Technical Information Service, NTIS ADA 280 282. U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW., Washington, DC 20460; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. If two or more radionuclides are present, the sum of their annual dose equivalent to the total

body or to any organ shall not exceed 4 mrem/year.

Table A - Average annual concentrations assumed to produce: a total body or organdose of 4 mrem/yr		
Radionuclide	Critical Organ	pCi per Liter
Tritium	Total body	20,000
Strontium-90	Bone Marrow	8

(e) MCL for uranium. The maximum contaminant level for uranium is 30 µg/L.

(f) Compliance dates.

(1) Compliance dates for combined radium-226 and -228, gross alpha particle activity, gross beta particle and photon radioactivity, and uranium; Community water systems must comply with the MCLs listed in paragraphs (b), (c), (d), and (e) of this section beginning December 8, 2003 and compliance shall be determined in accordance with the requirements of §§141.26 and 141.26. Compliance with reporting requirements for the radionuclides under appendix A to subpart (and appendices A and B to subpart Q is required on December 8, 2003.

(2) [Reserved]

(g) Best available technologies (BATs) for radionuclides. The Administrator, pursuant to section 1412 of the Act, hereby identifies as indicated in the following table the best technology available for achieving compliance with the maximum contaminant levels for combined radium-226 and -228, uranium, gross alpha particle activity, and beta particle and photon activity.

Table B - BAT for combined Radium-226 and Radium-228, Uranium, Gross Alpha Particle Activity, and Beta Particle And Photo Radioactivity	
Contaminant	BAT
Combined radium-226 and radium-228	Ion exchange, reverse osmosis, lime softening
Uranium	Ion exchange, reverse osmosis, lime softening, coagulation/filtration

Gross alpha particle activity (excluding radon and uranium)	Reverse osmosis
Beta particle and photon radioactivity	Ion exchange, reverse osmosis

(h) Small systems compliance technologies list for radionuclides are listed in Appendix I of this Chapter.

(i) Compliance technologies by system size, category and radionuclide NPDWR's are listed in Appendix J of this Chapter. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.15, §141.16, §142.10)

§11-20-7.5 Maximum residual disinfectant levels. (a) Maximum residual disinfectant levels (MRDLs) are as follows:

Disinfectant residual	MRDL(mg/L)
Chlorine	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)
Chlorine dioxide	0.8 (as ClO_2)

(b) Compliance dates.

(1) CWSs and NTNCWSs. Public water systems supplied by either a surface water source or by a ground water source under the direct influence of surface water serving 10,000 or more persons must comply with this section beginning January 1, 2002. Public water systems supplied by either a surface water source or by a ground water source under the direct influence of surface water serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(2) Transient NCWSs. Public water systems supplied by either a surface water source or by a ground water source under the direct influence of surface water serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Public water systems supplied by either a surface water source or by a ground water source under the direct influence of surface water serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

(c) The director hereby identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum residual disinfectant levels identified in subsection (a): control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels. [Eff and comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.65)

§11-20-8 Sampling and analytical requirements. All sampling and analyses required by this chapter shall be performed in accordance with procedures approved by the administrator. In any case in which a provision of this chapter requires sampling and analysis to be performed by the supplier of water, such sampling may, at the discretion of the director, be performed by the State pursuant to prior notification to the water supplier by the director and under such conditions as the director may specify. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2,

340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.21, §142.10)

§11-20-9 Microbiological contaminant sampling and analytical requirements. (a) Routine monitoring.

(1) A supplier of water shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan. These plans are subject to the director's review and revision.

(2) The monitoring frequency for total coliforms for community and non-community water systems is based on the population served by the system, as follows:

TOTAL COLIFORM MONITORING FREQUENCY

Population Served		Minimum Samples/Month	
25	to	1,000[1]	1
1,001	to	2,500	2
2,501	to	3,300	3
3,301	to	4,100	4
4,101	to	4,900	5
4,901	to	5,800	6
5,801	to	6,700	7
6,701	to	7,600	8
7,601	to	8,500	9
8,501	to	12,900	10
12,901	to	17,200	15
17,201	to	21,500	20
21,501	to	25,000	25
25,001	to	33,000	30
33,001	to	41,000	40
41,001	to	50,000	50
50,001	to	59,000	60
59,001	to	70,000	70
70,001	to	83,000	80
83,001	to	96,000	90
96,001	to	130,000	100
130,001	to	220,000	120
220,001	to	320,000	150
320,001	to	450,000	180
450,001	to	600,000	210
600,001	to	780,000	240
780,001	to	970,000	270
970,001	to	1,230,000	300
1,230,001	to	1,520,000	330
1,520,001	to	1,850,000	360
1,850,001	to	2,270,000	390
2,270,001	to	3,020,000	420
3,020,001	to	3,960,000	450
3,960,001	or more		480

[1] Includes public water systems which have at least 15 service connections, but serve fewer than 25 persons.

(3) The supplier of water shall collect samples at regular time intervals throughout the month, except that a system which uses only ground water (except ground water under the direct influence of surface water, as defined in section 11-20-2) and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites and prior approval by the director has been obtained.

(4) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for total coliforms in section 11-20-6. Repeat samples taken pursuant to subsection (b) are not considered special purpose samples, and shall be used to determine compliance with the MCL for total coliforms in section 11-20-6.

(b) Repeat monitoring.

(1) If a routine sample is total coliform-positive, the supplier of water shall collect a set of repeat samples within twenty-four hours of being notified of the positive result. The supplier who collects more than one routine sample per month shall collect no fewer than three repeat samples for each total coliform-positive sample found. A supplier who normally collects one routine sample per month shall collect no fewer than four repeat samples for each total coliform-positive sample found. The director may extend the twenty-four hour limit on a case-by-case basis if the supplier has a logistical problem in collecting or analyzing the repeat samples within twenty-four hours that is beyond the supplier's control. In the case of an extension, the director shall specify how much time the supplier has to collect the repeat samples.

(2) The supplier 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 director may waive the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. However, the supplier shall collect the required number of repeat samples. A system with a single service connection may take all repeats from the same sample tap.

(3) The supplier shall collect all repeat samples on the same day.

(4) If one or more repeat samples in the set is total coliform-positive, the supplier shall collect an additional set of repeat samples in the manner specified in paragraphs (1) to (3) unless the supplier determines the MCL for total coliforms in section 11-20-6 has been exceeded and notifies the director. The additional samples shall be collected within twenty-four hours of being notified of the positive result, unless the director extends the limit as provided in paragraph (1). The supplier shall repeat this process until either total coliforms are not detected in one complete set of repeat samples or the supplier determines that the MCL for total coliforms in section 11-20-6 has been exceeded and notifies the director.

(5) If a supplier collecting fewer than five routine samples per month has one or more total coliform-positive samples and the director does not invalidate the sample(s) under subsection (c), the supplier shall collect at least five routine samples during the next month the system provides water to the public.

(6) Results of all routine and repeat samples not

invalidated by the director shall be included in determining compliance with the MCL for total coliforms in section 11-20-6.

(c) Invalidation of total coliform samples. A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum monitoring requirements of this section.

(1) The director may invalidate a total coliform-positive sample if one or more of the following are met.

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

(B) The director, on the basis of the results of repeat samples collected as required by subsection (b)(1) to (4) determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. The director 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., the director 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 public water system has only one service connection).

(C) The director has substantial grounds to believe 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 supplier shall still collect all repeat samples required under subsection (b)(1) to (4), and use them to

determine compliance with the MCL for total coliforms in section 11-20-6. To invalidate a total coliform-positive sample under this paragraph, the decision with the rationale for the decision shall be documented in writing, and approved and signed by the director. The director shall make this document available to EPA and the public. The written documentation shall specify the cause of the total coliform-positive sample, and what action the supplier has taken, or will take, to correct this problem. The director may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(2) 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 Presence-Absence (P-A) Coliform Test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If a laboratory invalidates a sample because of such interference, the supplier shall collect another sample from the same location as the original sample within twenty-four hours of being notified of the interference problem, and have it analyzed for the presence of total coliforms. The supplier shall continue to re-sample within twenty-four hours and have the samples analyzed until it obtains a valid result. The director may waive the twenty-four hour time limit on a case-by-case basis.

(d) Sanitary surveys.

(1) Public water systems which collect four or fewer

routine samples per month shall undergo an initial sanitary survey by June 29, 1994 for community public water systems and June 24, 1999 for non-community water systems. Thereafter, systems shall undergo another sanitary survey every five years, except that non-community water systems using only protected and disinfected ground water, as defined by the director, shall undergo subsequent sanitary surveys at least every ten years after the initial sanitary survey. The director shall review the results of each sanitary survey to determine whether the existing monitoring frequency is adequate and what additional measures, if any, the supplier needs to undertake to improve drinking water quality.

(2) In conducting a sanitary survey of a system using ground water in a state having an EPA-approved wellhead protection program under section 1428 of the Safe Drinking Water Act, information on sources of contamination within the delineated wellhead protection area that was collected in the course of developing and implementing the program should be considered instead of collecting new information, if the information was collected since the last time the system was subject to a sanitary survey.

(3) Sanitary surveys shall be performed by the State or an agent approved by the director. The supplier is responsible for ensuring the survey takes place.

(e) Fecal coliforms/Escherichia coli (E. coli) testing.

(1) If any routine or repeat sample is total coliform-positive, the laboratory shall analyze the total coliform-positive culture medium to determine if fecal coliforms or E. coli are present.

(2) The director has the discretion to allow a supplier of water, on a case-by-case basis, to forgo fecal coliform or E. coli testing on a total coliform-positive sample if that supplier

classifies the total coliform-positive sample as fecal coliform-positive or E. coli-positive. In the event the laboratory fails to perform the required fecal coliform or E. coli analysis, the total coliform-positive sample will be classified as fecal coliform positive or E. coli-positive.

(f) Response to positive result.

(1) The supplier shall report the positive result for total coliforms or fecal coliforms or E. coli to the director by 4:00 p.m. of the day that the supplier is notified of the positive result. However, if the supplier is notified of the result after 4:00 p.m., then the supplier shall notify the director as soon as possible but no later than 10:00 a.m. of the next department business day.

(2) When a public water system has a fecal coliform-positive or E. coli-positive result, the supplier shall issue a boil water notice to all affected consumers.

(A) The boil water order shall be issued no later than twenty-four hours after the system has been notified of the positive fecal coliform or positive E. coli result. The boil water notice shall be in effect until negative total coliform results are obtained from the affected tap and from all other required repeat sample sites.

(B) The boil water notice shall not be required if all repeat samples collected are total coliform-negative, and these results are received within twenty-four hours of the fecal-positive or E. coli-positive result.

(g) Response to violation.

(1) When a public water system has exceeded the MCL for total coliforms as set forth in section 11-20-6, the supplier shall report the violation to the director no later than the end of the next business day after learning of the violation, and notify the public in accordance

with section 11-20-18.

(2) A supplier who has failed to comply with a coliform monitoring requirement, including the sanitary survey requirement, shall report the monitoring violation to the director within ten days after the supplier discovers the violation, and notify the public in accordance with section 11-20-18.

(h) Analytical techniques.

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

(2) The suppliers need only determine the presence or absence of total coliforms; a determination of total coliform density is not required.

(3) Suppliers shall conduct total coliform analyses in accordance with one of the following analytical methods or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C:

(A) Total Coliform Fermentation Technique, as set forth in 40 C.F.R. §141.21(f)(3);

(B) Total Coliform Membrane Filter Technique, as set forth in 40 C.F.R. §141.21(f)(3);

(C) Presence-Absence (P-A) Coliform Test, as set forth in 40 C.F.R. §141.21(f)(3);

(D) ONPG-MUG as set forth in 40 C.F.R. §141.21(f)(3);

(E) Colisure Test, as set forth in 40 C.F.R. §141.21(f)(3);

(F) E*Colite Test, as set forth in 40 C.F.R. §141.21(f)(3);

(G) m-ColiBlue24 Test, as set forth in 40 C.F.R. §141.21(f)(3);

(H) Readycult Coliforms 100 Presence/Absence Test, as set forth in 40 C.F.R. §141.21(f)(3);

(I) Membrane Filter Technique using Chromocult Coliform Agar, as set forth in 40 C.F.R. §141.21(f)(3); or

(J) Colitag Test, as set forth in 40 C.F.R. §141.21(f)(3).

(4) (Reserved)

(5) Suppliers shall conduct fecal coliform analysis in accordance with the following procedure. When the MTF Technique or Presence-Absence (P-A) Coliform Test is used to test for total coliforms, transfer the total coliform-positive culture using the procedure specified in 40 C.F.R. §141.21 (f)(5). For EPA-approved analytical methods which use a membrane filter, transfer the total coliform-positive culture using the procedure specified in 40 C.F.R. §141.21 (f)(5) for membrane filters. If the ONPG-MUG Test is used to test for total coliforms and the MUG test is positive, the MUG-positive tubes may be classified as fecal coliform positive and further testing is not required. If the ONPG positive tube is MUG negative, EC medium must be used to determine the presence of fecal coliforms. Shake the ONPG positive-MUG Negative tube vigorously and transfer the growth with a sterile 3 mm loop or sterile applicator stick into a tube of EC medium to determine the presence of fecal coliforms. Suppliers need only determine the presence or absence of fecal coliforms; a determination of fecal coliform density is not required.

(6) Suppliers shall conduct Escherichia coli (E. coli) analysis in accordance with one of the following procedures or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C:

(A) EC medium supplemented with 50 ug/ml of 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). EC medium is described in the 18th edition of Standard Methods for the Examination of Water and Wastewater, 1992, Method 9221E-p. 9-52, paragraph 1a. MUG may be added to EC medium before autoclaving. EC medium supplemented with 50 ug/ml of MUG is commercially available. At least 10 ml of

EC medium supplemented with MUG must be used. The inner inverted fermentation tube may be omitted. The procedure for transferring a total coliform-positive culture to EC medium supplemented with MUG shall be as specified in paragraph (5) for transferring a total coliform-positive culture to EC medium. Observe fluorescence with an ultraviolet light (366nm) in the dark after incubating tube at 44.5 + 0.2 °C for 24 + 2 hours; or

(B) Nutrient agar supplemented with 100 ug/ml 4-methylumbelliferyl-beta-D-glucuronide (MUG) (final concentration). Nutrient Agar is described in the 18th edition of Standard Methods for the Examination of Water and Wastewater, 1992, p. 9-47 to 9-48. This test is used to determine if a total coliform-positive sample, as determined by the Membrane Filter Technique or any other method in which a membrane filter is used, contains E. coli. Transfer the membrane filter containing a total coliform colony(ies) to nutrient agar supplemented with 100 ug/ml (final concentration) of MUG. After incubating the agar plate at 35 degrees Centigrade for 4 hours, observe the colony(ies) under ultraviolet light (366 nm) in the dark for fluorescence. If fluorescence is visible, E. coli are present.

(C) Minimal Medium ONPG-MUG (MMO-MUG) Test, as set forth in the article "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. (Note: The Autoanalysis Colilert System is an MMO-MUG test). If

the MMO-MUG test is total coliform-positive after a 24-hour incubation, test the medium for fluorescence with a 366-nm ultraviolet light (preferably with a 6-watt lamp) in the dark. If fluorescence is observed, the sample is E. coli-positive. If fluorescence is questionable (cannot be definitively read) after 24 hours, incubate the culture for an additional four hours (but not to exceed 28 hours total), and again test the medium for fluorescence. The MMO-MUG Test with hepes buffer in lieu of phosphate buffer is the only approved formulation for the detection of E. coli.

(D) The Colisure Test. A description of the Colisure Test may be obtained from the Millipore Corporation, Technical Services Department, 80 Ashby Road, Bedford, MA 01730.

(E) The membrane filter method with MI agar, a description of which is cited in footnote 6 to the table in paragraph 40 C.F.R 141.21(f)(3).

(F) E*Colite Test, a description of which is cited in footnote 10 to the table in paragraph 40 C.F.R 141.21(f)(3).

(G) m-ColiBlue24 Test, a description of which is cited in footnote 11 to the table in paragraph 40 C.F.R 141.21(f)(3).

(H) Readycult Coliforms 100 Presence/absence Test, a description of which is cited in footnote 13 to the table at paragraph 40 C.F.R 141.21(f)(3).

(I) Membrane Filter Technique using Chromocult Coliform Agar, a description of which is cited in footnote 14 to the table at paragraph 40 C.F.R 141.21(f)(3).

(J) Colitag, a description of which is cited in footnote 15 to the table at paragraph 40 C.F.R 141.21(f)(3).

(7) As an option to paragraph (6)(C), a system with a total coliform-positive, MUG-negative, MMO-MUG test may further analyze the culture for the presence of E. coli by transferring a 0.1 ml, 28-hour MMO-MUG culture to EC Medium + MUG with a pipet. The formulation and incubation conditions of EC Medium + MUG, and observation of the results are described in paragraph (6)(A)

(8) The following materials are incorporated by reference in this section with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 C.F.R. part 51. Copies of the analytical methods cited in Standard Methods for the Examination of Water and Wastewater may be obtained from the American Public Health Association et al.; 1015 Fifteenth Street, NW.; Washington DC 20005. Copies of the methods set forth in Microbiological Methods for Monitoring the Environment, Water and Waste may be obtained from ORD Publications, US EPA, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. Copies of the MMO-MUG Test as set forth in the article "National Field Evaluation of a Defined Substrate Method for the Simultaneous Enumeration of Total Coliforms and Escherichia coli from Drinking Water: Comparison with the Standard Multiple Tube Fermentation Method" (Edberg et al.) may be obtained from the American Water Works Association Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235. A description of the Colisure Test may be obtained from the Millipore Corp., Technical Services Department, 80 Ashby Road, Bedford, MA 01730. Copies may be inspected at EPA's Drinking Water Docket; 401 M Street, SW.; Washington, DC 20460, or at the Office of the Federal Register; 800 North Capitol Street, NW., Suite 700, Washington, DC. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp

11/30/02; am and comp 12/16/05; am and comp NOV 28 2011;] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.21, §142.10)

§11-20-10 Turbidity sampling and analytical requirements. (a) Samples shall be taken by suppliers of water for public water systems using surface water sources in whole or in part. Turbidity measurements shall be made by the Nephelometric Method 2130B cited in the 18th edition of Standard Methods for the Examination of Water and Wastewater, 1992, or by the methods cited in 40 C.F.R. §141.74(a)(1).

(b) The requirements in this subsection apply to filtered surface water systems until June 29, 1993. The requirements in this subsection apply to unfiltered systems until June 29, 1993, or until filtration is installed, whichever is later. The director shall determine, in writing pursuant to 42 U.S.C. §300g-1(b)(7)(C)(iii), which systems must install filtration.

(1) Samples shall be taken by suppliers of water for public water systems using surface water sources in whole or in part. Samples shall be taken at a representative entry point(s) to the water distribution system at least once per day, for the purpose of making turbidity measurements to determine compliance with section 11-20-5. If the director determines that a reduced sampling frequency in a non-community system will not pose a risk to public health, the director may reduce the required sampling frequency. The option of reducing the turbidity frequency shall be permitted only in those public water systems that practice disinfection and which maintain an active residual disinfectant in the distribution system, and in those cases where the director has indicated in writing that no unreasonable risk to health existed under the

circumstances of this option.

(2) If the result of a turbidity analysis indicates that the maximum allowable limit has been exceeded, the sampling and measurement shall 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 director within forty-eight hours. The repeat sample shall 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 five NTU, the supplier of water shall report to the director and notify the public as directed in sections 11-20-17 and 11-20-18.

(c) After June 29, 1993, samples shall be collected at the filtration plant effluent or immediately prior to entry into the distribution system. Sampling of the plant effluent is acceptable if there are no storage tanks between the sampling point and entry into the distribution system. Continuous monitoring with a turbidimeter and recording chart, or collection of grab samples every four hours is required for conventional treatment, direct, and diatomaceous earth filtration. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.22, §142.10)

§11-20-11 Inorganic chemical sampling and analytical requirements. (a) Community water systems shall conduct monitoring to determine compliance with the MCLs specified in section 11-20-3 in accordance with this section. Non-transient, non-community water systems shall conduct monitoring to determine compliance with the MCLs specified in section 11-20-3 in accordance with this section. Transient, non-community water systems shall

conduct monitoring to determine compliance with the nitrate and nitrite MCLs in section 11-20-3 in accordance with this section. Monitoring shall be conducted as follows:

(1) Ground water systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the initial compliance period. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(3) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(4) The director may reduce the total number of samples which must be analyzed by allowing the use of compositing. Composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory.

(A) If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within fourteen days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. Detection limits for each analytical method and MCLs for each inorganic contaminant are specified in 40 C.F.R. §141.23(a)(4)(i).

(B) If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the director at sampling points within a single system. In systems serving less than or equal to 3,300 persons, the director may permit compositing among different systems provided the five-sample limit is maintained.

(C) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed and the results reported to the State within fourteen days of collection.

(5) The frequency of monitoring for asbestos shall be in accordance with subsection (b); the frequency of monitoring for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be in accordance with subsection (c); the frequency of monitoring for nitrate shall be in accordance with subsection (d); and the frequency of monitoring for nitrite shall be in accordance with subsection (e).

(b) The frequency of monitoring conducted to determine compliance with the MCL for asbestos specified in section 11-20-3(b) shall be conducted as follows:

(1) Each community and non-transient, non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

(2) If the system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply to the director for a waiver of the monitoring requirement in paragraph (1). If the director grants the waiver, the system is not required to monitor.

(3) The director may grant a waiver based on a consideration of the following factors:
   (A) Potential asbestos contamination of the water source; and
   (B) The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

(4) A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with the provisions of paragraph (1).

(5) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(6) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of subsection (a).

(7) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(8) A system which exceeds the MCLs as determined in subsection (i) shall monitor quarterly

beginning in the next quarter after the violation occurred.

(9) The director may decrease the quarterly monitoring requirement to the frequency specified in paragraph (1) provided the director has determined that the system is reliably and consistently below the MCL. In no case shall the director make this determination unless a ground water system takes a minimum of two quarterly samples and a surface (or combined surface and ground) water system takes a minimum of four quarterly samples.

(10) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of this subsection, then the director may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(c) The frequency of monitoring conducted to determine compliance with the MCLs in section 11-20-3 for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be as follows:

(1) Ground water systems shall take one sample at each sampling point during each compliance period. Surface water systems (or combined surface and ground) shall take one sample annually at each sampling point.

(2) The system may apply to the director for a waiver from the monitoring frequencies specified in paragraph (1). States may grant a public water system a waiver for monitoring of cyanide, provided that the director determines that the system is not vulnerable due to lack of any industrial source of cyanide.

(3) A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(4) The director may grant a waiver provided surface

water systems have monitored annually for at least three years and ground water systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990). Both surface and ground water systems shall demonstrate that all previous analytical results were less than the MCL. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(5) In determining the appropriate reduced monitoring frequency, the director shall consider:
   (A) Reported concentrations from all previous monitoring;
   (B) The degree of variation in reported concentrations; and
   (C) Other factors which may affect contaminant concentrations such as changes in ground water pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

(6) A decision by the director to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the director or upon an application by the public water system. The public water system shall specify the basis for its request. The director shall review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

(7) Systems which exceed the MCLs as calculated in subsection (i) shall monitor quarterly beginning in the next quarter after the violation occurred.

(8) The director may decrease the quarterly

monitoring requirement to the frequencies specified in paragraphs (1) and (2) provided the director has determined that the system is reliably and consistently below the MCL. In no case shall the director make this determination unless a ground water system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(9) All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the director. The system must also comply with the initial sampling frequencies specified by the director to ensure that a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements of this section.

(d) All public water systems (community and non-community systems) shall monitor to determine compliance with the MCL for nitrate in section 11-20-3.

(1) Community and non-transient, non-community water systems served by ground water systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.

(2) For community and non-transient, non-community water systems, the repeat monitoring frequency for ground water systems shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 per cent of the MCL. The director may allow a ground water system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.

(3) For community and non-transient, non-community water systems, the director may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than 50 per cent

of the MCL. A surface water system shall return to quarterly monitoring if any one sample is greater than or equal to 50 per cent of the MCL.

(4) Each transient non-community water system shall monitor annually beginning January 1, 1993.

(5) After the initial round of quarterly sampling is completed, each community and non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(e) All public water systems (community and non-community systems) shall monitor to determine compliance with the MCL for nitrite in section 11-20-3(b).

(1) All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993 and ending December 31, 1995.

(2) After the initial sample, systems where an analytical result for nitrite is less than 50 per cent of the MCL shall monitor at the frequency specified by the director.

(3) For community and non-community water systems, the repeat monitoring frequency for any water system shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 per cent of the MCL. The director may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than the MCL.

(4) Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(f) Confirmation samples:

(1) Where the results of sampling for asbestos, antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium indicate an exceedance of the MCL, the director may require that one additional sample be collected as soon as

possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

(2) Where nitrate or nitrite sampling results indicate an exceedance of the MCL, the system shall take a confirmation sample within twenty-four hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the twenty-four hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with section 11-20-18(b) and meet other Tier 1 public notification requirements under section 11-20-18. Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(3) If a director-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with subsection (i). The director has the discretion to delete results of obvious sampling errors.

(g) The director may require more frequent monitoring than specified in subsections (b), (c), (d), and (e) or may require confirmation samples for positive and negative results at his or her discretion.

(h) Systems may apply to the director to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.

(i) Compliance with section 11-20-3 shall be determined based on the analytical result(s) obtained at each sampling point.

(1) For systems which are conducting monitoring at a frequency greater than annual, compliance with the MCLs for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium is determined by a running annual

average at any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average.

(2) For systems which are monitoring annually, or less frequently, the system is out of compliance with the MCLs for asbestos, antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the director, the determination of compliance will be based on the average of the two samples.

(3) Compliance with the MCLs for nitrate and nitrite is determined based on one sample if the levels of these contaminants are below the MCLs. If the levels of nitrate, nitrite, or both, exceed the MCLs in the initial sample, a confirmation sample is required in accordance with subsection (f)(2), and compliance shall be determined based on the average of the initial and confirmation samples.

(4) Arsenic sampling results will be reported to the nearest 0.001 mg/L.

(j) Each public water system shall monitor at the time designated by the director during each compliance period.

(k) Inorganic analysis:

(1) Analysis for the following contaminants shall be conducted in accordance with the methods in 40 C.F.R. §141.23(k)(1), or the alternative methods listed in Appendix A to subpart C of part 141, or their equivalent as determined by EPA. Criteria for analyzing arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, nickel, selenium, sodium, and thallium with digestion or directly without digestion,

and other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994. This document is available from the National Service Center for Environmental Publications (NSCEP), P.O. Box 42419, Cincinnati, OH 45242-0419 or http://www.epa.gov/nscep/.

(2) Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under this section shall be conducted using the sample preservation, container, and maximum holding time procedures specified in 40 C.F.R. §141.23(k)(2).

(3) Analysis under this section shall only be conducted by laboratories that have been certified by EPA or the director. Laboratories may conduct sample analysis under provisional certification until January 1, 1996. To receive certification to conduct analyses for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium, the laboratory must:

(A) Analyze Performance Evaluation samples which include those substances provided by EPA Environmental Monitoring Systems Laboratory or equivalent samples provided by the director; and

(B) Achieve quantitative results on the analyses that are within the acceptance limits specified in 40 C.F.R. §141.23(k)(3)(ii).

(l) Analyses for the purpose of determining compliance with section 11-20-3 shall be conducted using the requirements specified in subsections (1) through (q).

(1) Analyses for all community water systems utilizing surface water sources shall be completed by June 24, 1978. These analyses shall be repeated at yearly intervals.

(2) Analyses for all community water systems

utilizing only ground water sources shall be completed by June 24, 1979. These analyses shall be repeated at three-year intervals.

(3) For non-community water systems, whether supplied by surface or ground sources, analyses for nitrate shall be completed by December 24, 1980. These analyses shall be repeated at intervals determined by the director.

(4) The director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(m) If the result of an analysis made under subsection (l) indicates that the level of any contaminant listed in section 11-20-3 exceeds the MCL, the supplier of the water shall report to the director within seven days and initiate three additional analyses at the same sampling point within one month.

(n) When the average of four analyses made pursuant to subsection (m) 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 director pursuant to section 11-20-17 and give notice to the public pursuant to section 11-20-18. Monitoring after public notification shall be at a frequency designated by the director and shall continue until the MCL has not been exceeded in two successive samples or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(o) The provisions of subsections (m) and (n) notwithstanding, compliance with the MCL for nitrate shall be determined on the basis of the mean of two analyses. When a level exceeding the MCL for nitrate is found, a second analysis shall be initiated within twenty-four hours, and if the mean of the two analyses exceeds the MCL, the supplier of water shall report his findings to the director pursuant to section 11-20-17 and shall notify the public pursuant to section 11-20-18.

(p) For the initial analyses required by subsection (l)(1),(2), or (3), data for surface waters acquired within one year prior to the effective date and data for

ground waters acquired within three years prior to the effective date of this part may be substituted at the discretion of the director.

(q) (Reserved) [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.23, §142.10)

§11-20-12 Organic chemicals other than total trihalomethanes, sampling and analytical requirements.

(a) (Reserved)

(b) (Reserved)

(c) (Reserved)

(d) (Reserved)

(e) Analysis for the contaminants in section 11-20-4(d) and (e) shall be conducted using the EPA methods cited in 40 C.F.R. §141.24(e), or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C, or their equivalent as approved by EPA. Analysis for 1,2,3-trichloropropane shall be conducted using the EPA methods cited in 40 C.F.R. §141.40(g), or their equivalent as determined by EPA.

(f) Beginning with the initial compliance period, analysis of the contaminants listed in section 11-20-4(d) for the purpose of determining compliance with the MCL shall be conducted as follows:

(1) Ground water systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(2) Surface water systems (or combined surface and ground) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry

point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in section 11-20-4(d), with the exception of vinyl chloride, during each compliance period beginning in the initial compliance period.

(5) If the initial monitoring for benzene, carbon tetrachloride, para-dichlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, 1,1,1-trichloroethane, trichloroethylene, and vinyl chloride and the monitoring for all of the other contaminants listed in section 11-20-4(d) as allowed in paragraph (18) has been completed by December 31, 1992 and the system did not detect any contaminant listed in section 11-20-4(d) then each ground and surface water system shall take one sample annually beginning with the initial compliance period.

(6) After a minimum of three years of annual sampling, the director may allow ground water systems which have no previous detection of any contaminant listed in section 11-20-4(d) to take one sample during each compliance period.

(7) Each community and non-transient non-community ground water system which does not detect a contaminant listed in section 11-20-4(d) may apply to the director for a waiver from the requirement of paragraphs (5) and (6) after

completing the initial monitoring. (For the purposes of this section, detection is defined as greater than or equal to 0.0005 mg/l.) A waiver shall be effective for no more than six years (two compliance periods). States may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene.

(8) The director may grant a waiver after evaluating the following factor(s):

(A) Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted.

(B) If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(i) Previous analytical results.

(ii) The proximity of the system to potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

(iii) The environmental persistence and transport of the contaminants.

(iv) The number of persons served by the public water system and the proximity of a smaller system to a larger system.

(v) How well the water source is protected against contamination such as whether it is a surface or ground

water system. Ground water systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

(9) As a condition of the waiver a system must take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years), and update its vulnerability assessment considering the factors listed in paragraph (8). Based on this vulnerability assessment the director must reconfirm that the system is non-vulnerable. If the director does not make this reconfirmation within three years of the initial determination, then the waiver is invalidated and the system is required to sample annually as specified in paragraph (5).

(10) Each community and non-transient non-community surface water system which does not detect a contaminant listed in section 11-20-4(d) may apply to the director for a waiver from the requirements of paragraph (5) after completing the initial monitoring. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Systems meeting this criteria must be determined by the director to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the director (if any).

(11) If a contaminant listed in section 11-20-4(d), with the exception of vinyl chloride, is detected at a level exceeding 0.0005 mg/l in any sample, then:

(A) The system must monitor quarterly at each sampling point which resulted in a detection.

(B) The director may decrease the quarterly monitoring requirement specified in subparagraph (A) provided it has determined that the system is reliably and consistently below the MCL. In no case shall the director make this determination unless a ground water system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(C) If the director determines that the system is reliably and consistently below the MCL, the director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter(s) which previously yielded the highest analytical result.

(D) Systems which have three consecutive annual samples with no detection of a contaminant may apply to the director for a waiver as specified in paragraph (7).

(E) Ground water systems which 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 shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the director may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the director.

(12) Systems which violate the requirements of

section 11-20-4(d) as determined by paragraph (15) must monitor quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance as specified in paragraph (15), and the director determines that the system is reliably and consistently below the MCL, the system may monitor at the frequency and time specified in paragraph (11)(C).

(13) The director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the director, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by paragraph (15). The director has discretion to delete results of obvious sampling errors from this calculation.

(14) The director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within fourteen days of sample collection.

(A) If the concentration in the composite sample is greater than or equal to 0.0005 mg/l for any contaminant listed in section 11-20-4(d), then a follow-up sample must be taken within fourteen days at each sampling point included in the composite, and be analyzed for that contaminant.

(B) Duplicates may be analyzed as specified by section 11-20-11(a)(4)(C).

(C) Compositing based on population served by the system shall be performed as specified in section 11-20-11(a)(4)(B).

(D) Compositing samples prior to GC analysis shall be performed as specified in 40 C.F.R. §141.24(f)(14)(iv).

(15) Compliance with section 11-20-4(d) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(B) Systems monitoring annually or less frequently whose sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling.

(C) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(D) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(16) (Reserved)

(17) Analysis under this section shall only be conducted by laboratories that are certified by EPA or the director according to the conditions as specified in 40 C.F.R. §141.24(f)(17).

(18) The director may allow the use of monitoring data collected after January 1, 1988 required under section 1445 of the Safe Drinking Water Act for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the director may use those data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of paragraph (4). Systems which use grandfathered samples and did not detect any

contaminant listed in section 11-20-4(d) shall begin monitoring annually in accordance with paragraph (5) beginning with the initial compliance period.

(19) The director may increase required monitoring where necessary to detect variations within the system.

(20) Each certified laboratory must determine the method detection limit (MDL), as defined in Appendix B of Part 136 of 40 C.F.R. 141, at which it is capable of detecting VOCs. The acceptable method detection limit is 0.0005 mg/l. This concentration is the detection concentration for purposes of this section.

(21) Each public water system shall monitor at the time designated by the director within each compliance period.

(22) All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the director. The system must also comply with the initial sampling frequencies specified by the director to ensure that a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements of this section.

(g) (Reserved)

(h) Analysis of the contaminants listed in section 11-20-4(e) for the purposes of determining compliance with the MCL shall be conducted as follows:

(1) Ground water systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems shall take a minimum of one sample at points in the distribution system

that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Monitoring frequency:

(A) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in section 11-20-4(e) during each compliance period beginning with the initial compliance period.

(B) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

(C) Systems serving 3,300 persons or less which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(5) Each community and non-transient water system may apply to the director for a waiver from the requirement of paragraph (4). A system must reapply for a waiver for each compliance period.

(6) The director may grant a waiver after evaluating the following factor(s): Knowledge of

previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If a determination by the director reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

(A) Previous analytical results.

(B) The proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

(C) The environmental persistence and transport of the pesticide or PCBs.

(D) How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.

(E) Elevated nitrate levels at the water supply source.

(F) Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(7) If an organic contaminant listed in section 11-20-4(e) is detected (as defined by paragraph (18)) in any sample, then:

(A) Each system must monitor quarterly at each sampling point which resulted in a

detection.

(B) The director may decrease the quarterly monitoring requirement specified in subparagraph (A) provided it has determined that the system is reliably and consistently below the MCL. In no case shall the director make this determination unless a ground water system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(C) After the director determines the system is reliably and consistently below the MCL, the director may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(D) Systems which have three consecutive annual samples with no detection of a contaminant may apply to the director for a waiver as specified in paragraph (6).

(E) If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(8) Systems which violate the requirements of section 11-20-4(e) as determined by paragraph (11) must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the director determines the system is reliably and consistently below the MCL, as specified in paragraph (11), the system shall monitor at the frequency specified in paragraph (7)(C).

(9) The director may require a confirmation sample for positive or negative results. If a confirmation sample is required by the director, the result must be averaged with the

first sampling result and the average used for the compliance determination as specified by paragraph (11). The director has discretion to delete results of obvious sampling errors from this calculation.

(10) The director may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory and analyzed within fourteen days of sample collection.

(A) If the concentration in the composite sample detects one or more contaminants listed in section 11-20-4(e), then a follow-up sample must be taken within fourteen days at each sampling point included in the composite, and be analyzed for that contaminant.

(B) Duplicates may be analyzed as specified in section 11-20-11(a)(4)(C).

(C) Compositing based on population served by the system shall be performed as specified in section 11-20-11(a)(4)(B).

(11) Compliance with section 11-20-4(e) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point.

(B) Systems monitoring annually or less frequently whose sample result exceeds the regulatory detection level as defined by paragraph (18) must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly

sampling.

(C) If any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

(D) If a system fails to collect the required number of samples, compliance will be based on the total number of samples collected.

(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average.

(12) (Reserved)

(13) Analysis for PCBs shall be conducted as specified in 40 C.F.R. §141.24(h)(13).

(14) If monitoring data collected after January 1, 1990, are generally consistent with the requirements of this subsection then the director may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(15) The director may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source).

(16) The director has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by his or her sanctioned representatives and agencies.

(17) Each public water system shall monitor at the time designated by the director within each compliance period.

(18) Detection as used in this paragraph shall be defined as greater than or equal to the concentrations for each contaminant specified in 40 C.F.R. §141.24(h)(18).

(19) Analysis under this section shall only be conducted by laboratories that have received certification by EPA or the director and have

met the conditions as specified in 40 C.F.R. §141.24(h)(19).

(20) All new systems or systems that use a new source of water that begin operation after January 22, 2004 must demonstrate compliance with the MCL within a period of time specified by the director. The system must also comply with the initial sampling frequencies specified by the director to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements of this section. [Eff 12/16/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-3, 300j-4, 300g-6, and 300j-9; 40 C.F.R. Parts 141, 142, §141.24, §142.10)

§11-20-13 REPEALED [R NOV 28 2011]

§11-20-13.1 Radionuclide analytical methods, monitoring frequency and compliance requirements in community water systems. (a) Analysis for the following contaminants shall be conducted to determine compliance with §11-20-7 in accordance with the methods in 40 C.F.R. 141.25(a) or the alternative methods listed in Appendix A to subpart C of §141 40CFR, or their equivalent determined by the state in accordance with §11-20-14.

(b) When the identification and measurement of radionuclides other than those listed in paragraph (a) of this section is required, the following references are to be used, except in cases where alternative methods have been approved in accordance with §11-20-14.

(1) *Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions*, H.L. Krieger and S. Gold, EPA-R4-73-014. USEPA,

Cincinnati, Ohio, May 1973

(2) *HASL Procedure Manual*, Edited by John H. Harley, HASL, 300, ERDA Health and Safety Laboratory, New York, NY., 1973.

(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 shall be that concentration which can be counted with a precision of plus or minus 100 percent at the 95 percent confidence level (1.96σ where σ is the standard deviation of the net counting rate of the sample).

(1) To determine compliance with §11-20-7 (b), (c), and (e) the detection limit shall not exceed the concentrations in Table B to this paragraph.

TABLE B - Detection limits for gross alpha particle activity, Radium 226, Radium 228 and Uranium

Contaminant	Detection Limit
Gross alpha particle activity	3 pCi/L
Radium 226	1 pCi/L
Radium 228	1 pCi/L
Uranium	1 µg/L

(2) To determine compliance with §11-20-7(d) the detection limits shall not exceed the concentrations listed in Table C to this paragraph.

TABLE C - Detection limits for man-made beta particle and photon emitters

Radionuclide	Detection Limit
Tritium	1,000 pCi/L
Strontium-89	10 pCi/L
Strontium-90	2 pCi/L
Iodine-131	1 pCi/L
Cesium-134	10 pCi/L
Gross beta	4 pCi/L
Other radionuclides	1/10 of applicable limit

(d) To judge compliance with the maximum

contaminant levels listed in §11-20-07, averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

(e) The State has the authority to determine compliance or initiate enforcement action based upon analytical results or other information compiled by their sanctioned representatives and agencies.

(f) Monitoring and compliance requirements for gross alpha particle activity, radium-226, radium-228, and uranium.

(1) Community water systems (CWSs) must conduct initial monitoring to determine compliance with §141.66(b), (c), and (e) by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, "detection limit" is defined as in §11-20-13(c).

(A) Applicability and sampling location for existing community water systems or sources. All existing CWSs using ground water, surface water or systems using both ground and surface water (for the purpose of this section hereafter referred to as systems) must sample at every entry point to the distribution system that is representative of all sources being used (hereafter called a sampling point) under normal operating conditions. The system must take each sample at the same sampling point unless conditions make another sampling point more representative of each source or the State has designated a distribution system location, in accordance with paragraph (a)(2)(ii)(C) of this section.

(B) Applicability and sampling locations for new community water systems or sources. All new CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new source within the

first quarter after initiating use of the source. CWSs must conduct more frequent monitoring when ordered by the State in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

(2) Initial monitoring. Systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

(A) Systems without acceptable historical data, as defined below, must collect four consecutive quarterly samples at all sampling points before December 31, 2007.

(B) Grandfathering of data: States may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations.

(i) To satisfy initial monitoring requirements, a community water system having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(ii) To satisfy initial monitoring requirements, a community water system with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(iii) To satisfy initial monitoring requirements, a community water system with appropriate historical

data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the State finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon historical data and reasonable assumptions about the variability of contaminant levels between entry points. The State must make a written finding indicating how the data conforms to these requirements.

(C) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the State may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.

(D) If the average of the initial monitoring results for a sampling point is above the MCL, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the State.

(3) Reduced monitoring. States may allow community water systems to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point based on the following criteria:

(A) If the average of the initial monitoring results for each contaminant (i.e., gross alpha particle activity, uranium, radium-226, or radium-228) is below the

detection limit specified in Table B, in §11-20-13(c)(1), the system must collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

(B) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit, but at or below ½ the MCL, the system must collect and analyze for that contaminant using at least one sample at that sampling point every six years.

(C) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above ½ the MCL but at or below the MCL, the system must collect and analyze at least one sample at that sampling point every three years. For combined radium-226 and radium-228, the analytical results must be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above ½ the MCL but at or below the MCL, the system must collect and analyze at least one sample at that sampling point every three years.

(D) Systems must use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's sampling point is on a nine year

monitoring period, and the sample result is above ½ the MCL, then the next monitoring period for that sampling points is three years).

(E) If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the State.

(4) Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. States will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than ½ MCL, the State may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.

(5) A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/l. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l. The gross alpha measurement shall have a confidence interval of 95% (1.65σ, where σ is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a system uses a gross alpha particle activity measurement in lieu of a radium-226

and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to determine compliance and the future monitoring frequency.

(g) Monitoring and compliance requirements for beta particle and photon radioactivity. To determine compliance with the maximum contaminant levels in §141.66(d) for beta particle and photon radioactivity, a system must monitor at a frequency as follows:

(1) Community water systems (both surface and ground water) designated by the State as vulnerable must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the State. Systems already designated by the State must continue to sample until the State reviews and either reaffirms or removes the designation.

(A) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the State may reduce the frequency of monitoring at that sampling point to once every 3 years. Systems must collect all samples required in paragraph (b)(1) of this section during the reduced monitoring period.

(B) For systems in the vicinity of a nuclear facility, the State may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry

point(s), where the State determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (b)(1) of this section.

(2) Community water systems (both surface and ground water) designated by the State as utilizing waters contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the State. Systems already designated by the State as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the State reviews and either reaffirms or removes the designation.

(A) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

(B) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the State, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

(C) Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

(D) If the gross beta particle activity minus

the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the State may reduce the frequency of monitoring at that sampling point to every 3 years. Systems must collect the same type of samples required in paragraph (b)(2) of this section during the reduced monitoring period.

(E) For systems in the vicinity of a nuclear facility, the State may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the State determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the community water system's entry point(s) in accordance with paragraph (b)(1) of this section.

(3) Community water systems designated by the State to monitor for beta particle and photon radioactivity can not apply to the State for a waiver from the monitoring frequencies specified in paragraph (b)(1) or (b)(2) of this section.

(4) Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(5) If the gross beta particle activity minus the

naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample and the appropriate doses must be calculated and summed to determine compliance with §141.66(d)(1), using the formula in §141.66(d)(2). Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

(6) Systems must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in §141.66(d) beginning the month after the exceedance occurs. Systems must continue monthly monitoring until the system has established, by a rolling average of 3 monthly samples, that the MCL is being met. Systems who establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in paragraph (b)(1)(i) or (b)(2)(iv) of this section.

(h) General monitoring and compliance requirements for radionuclides.

(1) The State may require more frequent monitoring than specified in paragraphs (a) and (b) of this section, or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

(2) Each public water system shall monitor at the time designated by the State during each compliance period.

(3) Compliance. Compliance with §141.66 (b) through (c) will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(A) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of

any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

(B) For systems more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

(C) Systems must include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

(D) If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

(E) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, ½ the detection limit will be used to calculate the annual average.

(4) States have the discretion to delete results of obvious sampling or analytic errors.

(5) If the MCL for radioactivity set forth in §141.66 (b) through (e) is exceeded, the operator of a community water system must give notice to the State pursuant to §141.31 and to the public as required by subpart Q of this part.

[Eff and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.25, §141.26, §141.66)

§11-20-14 Alternative analytical techniques. With the written permission of the director, concurred with by

the administrator, an alternative analytical technique may be employed. An alternative technique shall be acceptable only 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 alternative analytical technique shall not decrease the frequency of monitoring required by this chapter. [Eff 12/26/81; comp 3/7/92; comp 1/2/93; comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.27, §142.10)

§11-20-15 Certified laboratories. (a) For the purpose of determining compliance with sections 11-20-9 through 11-20-13, 11-20-34, and 11-20-35, samples may be considered only if they have been analyzed by a laboratory certified by the director as specified in EPA 815-B-97-001, "Manual for the Certification of Laboratories Analyzing Drinking Water", 4th Edition, March 1997, except that measurements for turbidity, free chlorine residual, temperature and pH may be performed by any person acceptable to the director.

(b) Nothing in this chapter shall be construed to preclude the director 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 chapter. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; am and comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.28, §142.10)

§11-20-16 Monitoring of consecutive public water systems. When a public water system supplies water to one or more other public water systems, the director may modify the monitoring requirements imposed by this chapter to the extent that the interconnection of the public water

systems justifies treating them as a single public water system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the director. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; comp 12/15/95; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.29, §142.10)

§11-20-17 Reporting requirements. (a) Except where a shorter period is specified in this chapter, the supplier of water shall report to the director the results of any test measurements or analysis required by this chapter:

(1) Within the first ten days following the month in which the result is received; or

(2) Within the first ten days following the end of the required monitoring period as stipulated by the director, whichever of these is shortest.

(b) Except where a different reporting period is specified in this chapter, the supplier of water shall report to the director within forty-eight hours the failure to comply with any primary drinking water regulations (including failure to comply with monitoring requirements) set forth in this chapter.

(c) The supplier of water need not report analytical results to the director in cases where a state laboratory performs the analysis and reports the results to the director's office which would normally receive such notification from the supplier.

(d) The supplier of water, within ten days of completion of each public notification required pursuant to section 11-20-18, shall submit to the director a certification that it has fully complied with the public notification regulations. The water supplier must include with the certification a representative copy of each type of notice distributed, published, posted, made available to the persons served by the public water system, and to the media.

(e) The supplier of water shall submit to the

director within the time stated in the request copies of any records required to be maintained under section 11-20-19 or copies of any documents then in existence which the director or the administrator is entitled to inspect pursuant to the authority of P.L. No. 95-10, §1445, or chapter 340E, HRS.

(f) The supplier of water shall report information requested by the State in a format approved by the director.

[Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; am and comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-6, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4; 40 C.F.R. Parts 141, 142, §141.31, §142.10)

§11-20-18 Public notice requirements. (a) Public water systems shall give notice as described below.

(1) Each owner or operator of a public water system (community water systems, non-transient non-community water systems, and transient non-community water systems) must give notice for all violations of national primary drinking water regulations (NPDWR) and for other situations, as listed below to include violations of the maximum contaminant level (MCL), maximum residual disinfection level (MRDL), treatment technique (TT), monitoring requirements, and testing procedures in this chapter. Appendix G to this chapter identifies the tier assignment for each specific violation or situation requiring a public notice;

(A) NPDWR violations:

(i) Failure to comply with an applicable maximum contaminant level (MCL) or maximum residual disinfectant level (MRDL);

(ii) Failure to comply with a prescribed treatment technique (TT);

(iii) Failure to perform water quality monitoring as required by the

drinking water regulations;

(iv) Failure to comply with testing procedures as prescribed by a drinking water regulation;

(B) Variance and exemptions:

(i) Operation under a variance or an exemption;

(ii) Failure to comply with the requirements of any schedule that has been set under a variance or exemption;

(C) Special public notices:

(i) Occurrence of a waterborne disease outbreak or other waterborne emergency;

(ii) Exceedance of the nitrate MCL by non-community water systems (NCWS), where granted permission by the State under section 11-20-3(c);

(iii) Exceedance of the secondary maximum contaminant level (SMCL) for fluoride;

(iv) Availability of unregulated contaminant monitoring data;

(v) Other violations and situations determined by the State to require a public notice under this section, not already listed in Appendix G entitled "NPDWR Violations and Other Situations Requiring Public Notice", dated May 4, 2000, located at the end of this chapter and made a part of this section.

(2) Public notice requirements are divided into three tiers as defined below:

(A) Tier 1 public notice - required for NPDWR violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

(B) Tier 2 public notice - required for all other NPDWR violations and situations with

potential to have serious adverse effects on human health.

(C) Tier 3 public notice - required for all other NPDWR violations and situations not included in Tier 1 and Tier 2.

(3) Each public water system must provide public notice to persons served by the water system, in accordance with this section.

(A) Public water systems that sell or otherwise provide drinking water to other public water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves.

(B) If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the State may allow the system to limit distribution of the public notice to only persons served by that portion of the system which is out of compliance. Permission by the State for limiting distribution of the notice must be granted in writing;

(C) A copy of the notice must also be sent to the State, in accordance with the requirements under section 11-20-17(d).

(b) Tier 1 Public Notice - form, manner, and frequency of notice.

(1) Tier 1 public notices are required for the following violations or situations:

(A) Violation of the MCL for total coliforms when fecal coliform or E. coli are present in the water distribution system (as specified in section 11-20-6(b), or when the water system fails to test for fecal coliforms or E. coli when any repeat sample tests positive for coliform (as specified in section 11-20-9(f)(1);

(B) Violation of the MCL for nitrate, nitrite, or total nitrate and nitrite, as defined in section 11-20-3, or when the water system fails to take a confirmation sample within 24 hours of the system's receipt of the first sample showing an exceedance of the nitrate or nitrite MCL, as specified in section 11-20-11(f)(2);

(C) Exceedance of the nitrate MCL by non-community water systems, where permitted to exceed the MCL by the State under section 11-20-3(c) as required under subsection (i);

(D) Violation of the MRDL for chlorine dioxide, as defined in section 11-20-7.5(a), when one or more samples taken in the distribution system the day following an exceedance of the MRDL at the entrance of the distribution system exceed the MRDL, or when the water system does not take the required samples in the distribution system, as specified in section 11-20-45.1(c)(3)(B)(i);

(E) Violation of the turbidity MCL under section 11-20-5(b)(2), where the state determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;

(F) Violation of the Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment rule (IESWTR), or Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit (as identified in Appendix G, where the State determines after consultation that a Tier 1 notice is required or where consultation does not take place within 24 hours after the system learns of the violation;

(G) Occurrence of a waterborne disease outbreak, as defined in section 11-20-2, or other waterborne emergency (such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination);

(H) Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the State either in its regulations or on a case-by-case basis.

(2) Public water systems must issue Tier 1 public notices at the following times and under the following conditions:

(A) Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;

(B) Initiate consultation with the state as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements; and

(C) Comply with any additional public notification requirements (including any repeat notices or direction on the duration of the posted notices) that are established as a result of the consultation with the state. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served.

(3) Public water systems must provide Tier 1 public notices within 24 hours in a manner designed to reach all persons served including:

residential, transient, and non-transient users employing one or more of the following forms of delivery:

(A) Appropriate broadcast media (such as radio and television);

(B) Posting of the notice in conspicuous locations throughout the area served by the water system;

(C) Hand delivery of the notice to persons served by the water system; or

(D) Another delivery method approved or ordered in writing by the state.

(c) Tier 2 Public Notice - form, manner, and frequency of notice.

(1) Tier 2 public notices are required for the following violations or situations:

(A) All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 notice is required under subsection (b)(1) or where the state determines that a Tier 1 notice is required;

(B) Violations of the monitoring and testing procedure requirements, where the state determines that a Tier 2 rather than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation; and

(C) Failure to comply with the terms and conditions of any variance or exemption in place.

(2) Public water systems must issue Tier 2 public notices at the following times and under the following conditions:

(A) Public water systems must provide the public notice as soon as practical, but no later than thirty days after the system learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than seven days, even if the violation or

situation is resolved. The state may, in appropriate circumstances, allow additional time for the initial notice of up to three months from the date the system learns of the violation. Extensions granted by the state must be in writing;

(B) The public water system must repeat the notice every three months as long as the violation or situation persists, unless the state determines that appropriate circumstances warrant a different repeat notice frequency. In no circumstances may the repeat notice be given less frequently than once per year. State determinations allowing repeat notices to be given less frequently than once every three months must be in writing;

(C) For the turbidity violations specified in this section, public water systems must consult with the state as soon as practical but no later than 24 hours after the public water system learns of the violation, to determine whether a Tier 1 public notice under subsection (b)(1) is required to protect public health. When consultation does not take place within the 24-hour period, the water system must distribute a Tier 1 notice of the violation within the next 24 hours (i.e., no later than forty-eight hours after the system learns of the violation), following the requirements under subsections (b)(2) and (b)(3). Consultation with the state is required for:

(i) Violation of the turbidity MCL under section 11-20-5; or

(ii) Violation of the SWTR, IESWTR, or LT1ESWTR treatment technique requirement resulting from a single exceedance of the maximum allowable turbidity limit;

(3) Public water systems must provide Tier 2 public

notices in a manner designed to reach residential, transient, and non-transient users in the required time period, employing one or more of the following forms of delivery:

(A) Unless directed otherwise by the state in writing, community water systems must provide notice by:

(i) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(ii) Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by the notice required in clause (i). Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: Publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places served by the system or on the Internet; or delivery to community organizations;

(B) Unless directed otherwise by the state in writing, non-community water systems must provide notice by:

(i) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection

(where known); and

(ii) Any other method reasonably calculated to reach other persons served by the system if they would not normally be reached by the notice required in clause (i). Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include: Publications in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or, delivery of multiple copies in central locations (e.g., community centers).

(d) Tier 3 Public Notice - form, manner, and frequency of notice.

(1) Tier 3 public notices are required for the following violations or situations:

(A) Monitoring violations of this chapter except where a Tier 1 notice is required under subsection (b)(1) or where the state determines that a Tier 2 notice is required;

(B) Failure to comply with a testing procedure established in this chapter, except where a Tier 1 notice is required under subsection (b)(1) or where the state determines that a Tier 2 notice is required;

(C) Operation under a variance granted under section 11-20-20 or an exemption granted under section 11-20-23;

(D) Availability of unregulated contaminant monitoring results, as required under subsection (g); and

(E) Exceedance of the fluoride secondary maximum contaminant level (SMCL), as required under subsection (h);

(2) Public water systems must issue Tier 3 public

notices at the following times and under the following conditions:

(A) Public water systems must provide the Tier 3 public notice not later than one year after the public water system learns of the violation or situation or begins operating under a variance or exemption. Following the initial notice, the public water system must repeat the notice annually for as long as the violation, variance, exemption, or other situation persists. If the public notice is posted, the notice must remain in place for as long as the violation, variance, exemption, or other situation persists, but in no case less than seven days (even if the violation or situation is resolved);

(B) Instead of individual Tier 3 public notices, a public water system may use an annual report detailing all violations and situations that occurred during the previous twelve months, as long as the timing requirements of subparagraph (A) are met;

(3) Public water systems must provide the initial Tier 3 notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the Tier 3 public notice must, at a minimum meet the following requirements:

(A) Unless directed otherwise by the state in writing, community water systems must provide notice by:

(i) Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

(ii) Any other method reasonably calculated to reach other persons regularly served by the system, if

they would not normally be reached by the notice required in clause (i). Such persons may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include: publication in a local newspaper; delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers); posting in public places or on the Internet; or delivery to community organizations;

(B) Unless directed otherwise by the state in writing, non-community water systems must provide notice by:

(i) Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

(ii) Any other method reasonably calculated to reach other persons served by the system, if they would not normally be reached by the notice required in clause (i). Such persons may include those who may not see a posted notice because the notice is not in a location they routinely pass by. Other methods may include: publication in a local newspaper or newsletter distributed to customers; use of E-mail to notify employees or students; or delivery of multiple copies in central locations

(e.g., community centers);

(4) For community water systems, the Consumer Confidence Report (CCR) required under section 11-20-48.5 may be used as a vehicle for the initial Tier 3 public notice and all required repeat notices, as long as:

(A) The CCR is provided to persons served no later than 12 months after the system learns of the violation or situation as required under paragraph (2);

(B) The Tier 3 notice contained in the CCR follows the content requirements under subsection (e); and

(C) The CCR is distributed following the delivery requirements under paragraph (3).

(e) Content of public notice.

(1) Each public notice of a violation of a NPDWR or other situation requiring public notice, must include the following elements:

(A) A description of the violation or situation, including the contaminants(s) of concern, and as applicable, the contaminant levels(s);

(B) When the violation or situation occurred:

(C) Any potential adverse health effects from the violation or situation, including the standard language under paragraphs (4)(A) or (4)(B) whichever is applicable;

(D) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;

(E) Whether alternative water supplies should be used;

(F) What actions consumers should take, including when they should seek medical help, if known;

(G) What the system is doing to correct the violation or situation;

(H) When the water system expects to return to compliance or resolve the situation;

(I) The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and

(J) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (4)(C), where applicable.

(2) Public notices for variances and exemptions.

(A) Each public notice of a new variance or exemption must contain:

(i) An explanation of the reasons for the variance or exemption;

(ii) The date on which the variance or exemption was issued;

(iii) A brief status report on the steps the system is taking to install treatment, find alternative sources of water or otherwise comply with the terms and schedules of the variance or exemption; and

(iv) A notice of any opportunity for public input in the review of the variance or exemption;

(B) If a public water system violates the conditions of a variance or exemption, the public notice must contain the ten elements listed in paragraph (1).

(3) Public notice presentation.

(A) Each public notice required by this section:

(i) Must be displayed in a conspicuous way when printed or posted;

(ii) Must not contain overly technical language or very small print;

(iii) Must not be formatted in a way that defeats the purpose of the notice;

(iv) Must not contain language which nullifies the purpose of the notice;

(B) Each public notice required by this section must comply with multilingual requirements as follows:

(i) For public water systems serving a large proportion of non-English speaking consumers, as determined by the state, the public notice must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language;

(ii) In cases where the state has not determined what constitutes a large proportion of non-English speaking consumers, the public water system must include in the public notice the same information as in clause (i), where appropriate to reach a large proportion of non-English speaking persons served by the water system;

(4) Public water systems are required to include the following standard language in their public notice:

(A) Standard health effects language for MCL or MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. Public water systems must include in each public notice the health effects language specified in Appendix A entitled "Standard Health Effects Language For Public Notification", dated May 4, 2000, located at the end of this chapter and made a part of this section, corresponding to each MCL, MRDL, and treatment technique violation listed in Appendix G entitled "NPDWR Violations and Other Situations

Requiring Public Notice", dated May 4, 2000, located at the end of this chapter and made a part of this section, and for each violation of a condition of a variance or exemption;

(B) Standard language for monitoring and testing procedure violations. Public water systems must include the following language in their notice, including the language necessary to fill in the blanks, for all monitoring and testing procedure violations listed in Appendix G:
"We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we "did not monitor or test" or "did not complete all monitoring or testing" for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."

(C) Standard language to encourage the distribution of the public notice to all persons served. Public water systems must include in their notice the following language (where applicable):

"Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail."

(f) Notice of new billing units or new customers.

(1) Community water systems must give a copy of the most recent public notice for any continuing violation, the existence of a variance or exemption, or other ongoing situations

requiring a public notice to all new billing units or new customers prior to or at the time service begins;

(2) Non-community water systems must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance or exemption, or other situation requiring a public notice for as long as the violation, variance, exemption, or other situation persists.

(g) Special notice of the availability of unregulated contaminant monitoring results.

(1) The owner or operator of a community water system or non-transient, non-community water system required to monitor under 40 C.F.R. §141.40 must notify persons served by the system of the availability of the results of such sampling no later than 12 months after the monitoring results are known;

(2) The form and manner of the public notice must follow the requirements for a Tier 3 public notice prescribed in subsections (d)(3), (d)(4)(A), and (d)(4)(C). The notice must also identify a person and provide the telephone number to contact for information on the monitoring results.

(h) Special notice for exceedance of the SMCL for fluoride.

(1) Community water systems that exceed the fluoride secondary maximum contaminant level (SMCL) of 2 mg/l as specified in 40 C.F.R. §143.3 (determined by the last single sample taken in accordance with section 11-20-11), but do not exceed the maximum contaminant level (MCL) of 4 mg/l for fluoride (as specified in section 11-20-3), must provide the public notice in paragraph (3) to persons served. Public notice must be provided as soon as practical but no later than 12 months from the day the water system learns of the exceedance. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and

to the director. The public water system must repeat the notice at least annually for as long as the SMCL is exceeded. If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded, but in no case less than seven days (even if the exceedance is eliminated). On a case-by-case basis, the state may require an initial notice sooner than 12 months and repeat notices more frequently than annually;

(2) The form and manner of the public notice (including repeat notices) must follow the requirements for a Tier 3 public notice in subsections (d)(3), (d)(4)(A), and (d)(4)(C);

(3) The notice must contain the following language, including the language necessary to fill in the blanks:

"This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/l) of fluoride may develop cosmetic discoloration of their permanent teeth (dental fluorosis). The drinking water provided by your community water system [name] has a fluoride concentration of [insert value] mg/l.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and/or pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride containing products. Older children

and adults may safely drink the water.

Drinking water containing more than 4 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/l of fluoride, but we're required to notify you when we discover the fluoride levels in your drinking water exceed 2 mg/l because of this cosmetic dental problem.

For more information, please call [name of water system contact] of [name of community water system] at [phone number]. Some home water treatment units are also available to remove fluoride from drinking water. To learn more about available home water treatment units, you may call NSF International at 1-877-8-NSF-HELP."

(i) Special notice for nitrate exceedance above MCL by non-community water systems (NCWS), where granted permission by the state under section 11-20-3(c).

(1) The owner or operator of a non-community water system granted permission by the state under section 11-20-3(c) to exceed the nitrate MCL must provide notice to persons served according to the requirements for a Tier 1 notice under subsections (b)(1) and (b)(2);

(2) Non-community water systems granted permission by the state to exceed the nitrate MCL under section 11-20-3(c) must provide continuous posting of the fact that nitrate levels exceed 10 mg/l and the potential health effects of exposure, according to the requirements for Tier 1 notice delivery under subsection (b)(3) and the content requirements under subsection (e).

(j) Notice by State on behalf of the public water system.

(1) The State may give the notice required by the

section on behalf of the owner and operator of the public water system if the state complies with the requirements of this section;

(2) The owner or operator of the public water system remains responsible for ensuring that the requirements of this section are met.

(k) Notice for repeated failure to conduct monitoring of the source water for *Cryptosporidium* and for failure to determine bin classification or mean *Cryptosporidium* level.

(1) The owner or operator of a community or non-community water system that is required to monitor source water under subsection 11-20-46.2(b) must notify persons served by the water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect any 3 months of monitoring as specified in paragraph 11-20-46.2(b)(3). The notice must be repeated as specified in subparagraph 11-20-18(c)(2)(B).

(2) The owner or operator of a community or non-community water system that is required to determine a bin classification under subsection 11-20-46.2(k), or to determine mean *Cryptosporidium* level under subsection 11-20-46.2(m), must notify persons served by the water system that the determination has not been made as required no later than 30 days after the system has failed report the determination as specified in paragraph 11-20-46.2(k)(5) or (m)(1), respectively. The notice must be repeated as specified in subparagraph 11-20-18(c)(2)(B). The notice is not required if the system is complying with a State-approved schedule to address the violation.

(3) The form and manner of the public notice must follow the requirements for a Tier 2 public notice prescribed in paragraph 11-20-18(c)(3). The public notice must be presented as required in paragraph 11-20-18(e)(3).

(4) The notice must contain the following language,

including the language necessary to fill in the blanks.

(A) The special notice for repeated failure to conduct monitoring must contain the following language: "We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by (required bin determination date). We ""did not monitor or test"" or ""did not complete all monitoring or testing"" on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the deadline required, (date). For more information, please call (name of water system contact) of (name of water system) at (phone number)."

(B) The special notice for failure to determine bin classification or mean *Cryptosporidium* level must contain the following language: "We are required to monitor the source of your drinking water for *Cryptosporidium* in order to determine by (date) whether water treatment at the (treatment plant name) is sufficient to adequately remove *Cryptosporidium* from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of (date). For more

information, please call (name of water system contact) of (name of water system) at (phone number)."

(C) Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-6, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-3, 300g-4, 300g-6, 300j-4, 300j-9; 40 C.F.R. Parts 141, 142, §141.32, §142.10, §143.5)

§11-20-19 Record maintenance. (a) Any supplier of water of a public water system subject to the provisions of this chapter shall retain on its premises or at a convenient location near its premises the following records.

(b) Records of microbiological analyses and turbidity analyses made pursuant to this chapter shall be kept for not less than five years. Records of chemical analyses made pursuant to this chapter shall be kept for not less than ten 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.

(c) Records of action taken by the public water system to correct violations of primary drinking water regulations shall be kept for a period not less than three years after the last action taken with respect to the particular violation involved.

(d) Copies of any written reports, summaries, or communications relating to sanitary surveys of the public water system shall be kept for a period of not less than ten years after completion of the sanitary survey involved.

(e) Records concerning a variance or exemption granted to the public water system shall be kept for a period ending not less than five years following the expiration of such variance or exemption.

(f) Copies of public notices issued pursuant to section 11-20-18 and certifications made to the State pursuant to section 11-20-17(d) must be kept for three years after issuance.

(g) Copies of monitoring plans developed pursuant to this chapter shall be kept for the same period of time as the records of analyses taken under the plan are required to be kept under subsection (b), except as specified elsewhere in this chapter. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4; 40 C.F.R. Parts 141, 142, §141.33, §142.10, §142.16)

§11-20-20 Requirements for a variance. (a) The director may grant one or more variances to any public water system from any MCL requirement of an applicable state primary drinking water regulation upon a finding that:

(1) Because of characteristics of the raw water sources which are reasonably available to the public water system, the public water system cannot meet the MCL requirement despite application of the best technology, treatment

techniques, or other means, which the director finds are generally available (taking costs into consideration); and

(2) The granting of a variance will not result in an unreasonable risk to the health of persons served by the public water system.

(b) The director may grant one or more variances to any public water system from any requirement of a specified treatment technique of an applicable state primary drinking water regulation upon a finding that the public water system applying for the variance has demonstrated that such treatment technique is not necessary to protect the health of persons because of the nature of the raw water source of such public water system.

(c) The director will not grant any variance from the filtration and disinfection criteria.

(d) The director will not grant any variance from the MCL for total coliform. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-21 Variance request. (a) A supplier of water seeking a variance shall submit a written request to the director. Suppliers of water may submit a joint request for variances when they seek similar variances under similar circumstances. Any written request for a variance or variances shall include the following information:

(1) The nature and duration of variance requested; and

(2) Relevant analytical results of water quality sampling of the public water system, including sampling of raw water relevant to the variance request.

(b) For any request made under section 11-20-20(a), the following shall be required:

(1) Full discussion of, and supporting data

regarding, the best available treatment technology and techniques, including evidence of the inability of the public water system to comply despite the application of such technology and techniques;

(2) Information on economic and legal factors relevant to the ability to comply;

(3) A proposed compliance schedule, including the dates for achieving each step in the compliance schedule. Such schedule shall include as a minimum the following dates:

(A) Date by which arrangement for alternative raw water source or for improvement of existing raw water source will be completed;

(B) Date by which the connection of the alternative raw water source or improvement of existing raw water source will be initiated; and

(C) Date by which final compliance is to be achieved;

(4) A plan for the provision of safe drinking water in the case of an excessive rise in the contaminant level for which the variance is requested; and

(5) A plan for interim control measures during the effective period of variance.

(c) For any request made under section 11-20-20(b) a statement that the public water system will perform monitoring and other reasonable requirements prescribed by the director as a condition to the variance.

(d) Any other information the applicant believes to be pertinent.

(e) Such other information as the director may require to minimize the risk to human health or welfare. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-4; 40 C.F.R. Parts 141, 141.4, 142, §142.10, §142.20)

§11-20-22 Consideration of variance request. (a) In the director's consideration of whether the public water system is unable to comply with a contaminant level requirement of a state primary drinking water regulation because of the nature of the raw water source, the director shall consider such factors as he considers to be relevant, including the following:

(1) The availability, effectiveness, and reliability of treatment methods for the contaminant for which the variance is requested; and

(2) Cost and other economic considerations such as for implementing treatment, improving the quality of the source water or using an alternate source.

(b) In the director's consideration of whether a public water system should be granted a variance to a required treatment technique because such treatment is unnecessary to protect the public health, the director shall consider such factors as the following:

(1) Quality of the water source including water quality data and pertinent sources of pollution; and

(2) Susceptibility of the source to contamination and the source protection measures employed by the public water system. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-23 Requirements for an exemption. (a) The director may exempt any public water system from any MCL requirement or any treatment technique requirement, or from both, of an applicable state primary drinking water regulation upon a finding that:

(1) Due to compelling factors (which may include

economic factors), the public water system is unable to comply with such contaminant level or treatment technique requirement;

(2) The public water system was in operation on the effective date of such contaminant level or treatment technique requirement; and

(3) The granting of the exemption will not result in an unreasonable risk to health.

(b) The director will not exempt any surface water system or a ground water system under the direct influence of surface water from the requirements to provide disinfection for the water entering the distribution system.

(c) The director will not grant any exemptions to the MCL for total coliform. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-24 Exemption request. A supplier of water seeking an exemption shall submit a written request to the director. Suppliers of water may submit a joint request for exemptions when they seek similar exemptions under similar circumstances. Any written request for an exemption or exemptions shall include the following information:

(1) The nature and duration of exemption requested;

(2) Relevant analytical results of water quality sampling of the public water system;

(3) Explanation of the compelling factors such as time or economic factors which prevent such public water system from achieving compliance;

(4) A proposed compliance schedule, including the date when each step toward compliance will be achieved;

(5) Any other information the applicant believes to be pertinent; and

(6) Such other information as the director may require to minimize the risk to human health and

welfare. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99;comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-25 Consideration of an exemption request. In the director's consideration of whether the public water system is unable to comply due to compelling factors, the director shall consider such factors as the director determines to be relevant, including the following:

(1) Construction, installation, or modification of treatment equipment or public water systems;

(2) The time needed to put into operation a new treatment facility to replace an existing system which is not in compliance; and

(3) Economic feasibility of compliance. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; am and comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-26 Disposition of a request for variance or exemption. (a) If the director determines that a request for a variance or exemption is inadequate or incomplete, the director may deny the request. If the director fails to act on a variance or exemption request within one hundred eighty days after the request is submitted, the request will be deemed to be granted.

(b) If the director proposes to grant a variance or exemption request submitted pursuant to section 11-20-21 or 11-20-24, respectively, the director shall notify the applicant of the director's decision in writing. Such notice shall identify the variance or exemption, the

facility covered, and shall specify, as appropriate, the period of time for which the variance will be effective or the termination date of the exemption.

(1) For the type of variance specified in section 11-20-20(a) or for an exemption, such notice shall also provide that the variance or exemption will be terminated when the public water system comes into compliance with the applicable regulation, and may be terminated upon a finding by the director that the public water system has failed to comply with any requirements of a final schedule issued pursuant to section 11-20-28;

(2) For the type of variance specified in section 11-20-20(b) such notice shall provide that the variance may be terminated at any time upon a finding that the nature of the raw water source is such that the specified treatment technique for which the variance was granted is necessary to protect the health of persons or upon a finding that the public water system has failed to comply with monitoring and other requirements prescribed by the director as a condition to the granting of the variance.

(c) For a variance specified in section 11-20-20(a)(1) or an exemption, the director shall propose a schedule for:

(1) Compliance (including increments of progress) by the public water system with each contaminant level requirement covered by the variance or each contaminant level and treatment technique covered by the exemption; and

(2) Implementation by the public water system of such control measures as the director may require for each contaminant covered by the variance or exemption.

(d) The proposed schedule for compliance shall contain such conditions as the director may prescribe and shall specify dates by which steps towards compliance are to be taken, including, where applicable:

(1) Date by which arrangement for an alternative raw water source or improvement or existing raw

water source will be completed;

(2) Date of initiation of the connection of the alternative raw water source or improvement of the existing raw water source; and

(3) Date by which final compliance is to be achieved.

(e) The proposed schedule for compliance for a variance specified in section 11-20-20(a)(1) may, if the public water system has no access to an alternative raw water source, and can effect or anticipate no adequate improvement of the existing raw water source, specify an indefinite time period for compliance until a new and effective treatment technology is developed at which time a new compliance schedule shall be prescribed by the director.

(f) The proposed schedule for implementation of interim control measures during the period of the variance shall specify interim treatment techniques, methods and equipment, and dates by which steps toward meeting the interim control measures are to be met.

(g) The schedule shall be prescribed by the director within one year after the granting of the variance or exemption, subsequent to provision of opportunity for hearing pursuant to section 11-20-27.

(h) The director may prescribe reasonable conditions as part of any variance or exemption. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-27 Public hearings on variances, variance schedules, and exemption schedules. (a) Before a variance, variance schedule, or exemption schedule proposed by the director pursuant to section 11-20-26 may take effect, the director shall provide notice and opportunity for public hearing on the variance, variance schedule, or exemption schedule. A notice given pursuant to the preceding sentence may cover the granting of more

than one variance, variance schedule, or exemption schedule and a hearing held pursuant to such notice shall include each of the variances, variance schedules, or exemption schedules covered by the notice. Such notice shall include a summary of the proposed variance, variance schedule, or exemption schedule, and shall inform interested persons that they may submit written comments on the proposed variance, variance schedule, or exemption schedule, and may request a public hearing.

(b) Public notice of an opportunity for hearing on a variance, variance schedule, or exemption schedule shall be circulated in a manner designed to inform interested and potentially interested persons of the proposed variance, variance schedule, or exemption schedule, and shall, in addition to compliance with section 92-41, HRS include at least the following:

(1) Posting of a notice in the principal post office of each community or area served by the public water system, and publishing of a notice in a newspaper or newspapers of general circulation in the area served by the public water system; and

(2) Mailing of a notice to other appropriate state or local agencies at the director's discretion.

(c) Requests for hearing may be submitted by an interested person. Frivolous or insubstantial requests for hearing may be denied by the director. Requests shall be submitted to the director within thirty days after issuance of the public notices provided for in subsection (b). Such requests shall include the following information:

(1) The name, address, and telephone number of the individual, organization, or other entity requesting a hearing;

(2) A brief statement of the interest of the person making the request in the proposed variance, variance schedule, or exemption schedule and of information that the requesting person intends to submit at such hearing; and

(3) The signature of the individual making the request, or, if the request is made on behalf of an organization or other entity, the

signature of a responsible official of the organization or other entity.

(d) The director shall give notice in the manner set forth in subsection (b) of any hearing to be held pursuant to a request submitted by an interested person or on the person's own motion. Notice of the hearing shall also be sent to the persons requesting the hearing, if any. Notice of the hearing shall include a statement of the purpose of the hearing, information regarding the time and location for the hearing, and the address and telephone number of an office at which interested persons may obtain further information concerning the hearing. Notice of the hearing shall be given not less than fifteen days prior to the time scheduled for the hearing.

(e) A hearing convened pursuant to subsection (d) shall not be deemed to be a "contested case" hearing within the meaning of chapter 91, Hawaii Revised Statutes. The hearing shall be conducted before a hearing officer to be designated by the director, or the director may conduct the hearing. The hearing shall be conducted by the hearing officer in an informal, orderly and expeditious manner. The hearing officer shall have authority to call witnesses, receive oral and written testimony and take such other action as may be necessary to assure the fair and efficient conduct of the hearing.

(f) The director may provide that the variance, variance schedule, or exemption schedule shall become effective thirty days after notice of opportunity for hearing is given pursuant to subsection (b) if no timely request for hearing is submitted and the director does not determine to hold a public hearing on the director's own motion. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 2 8 2011] (Auth: HRS §§340E-2, 40E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-28 Final schedule. (a) Within sixty days after the termination of any public hearing held pursuant to section 11-20-27, the director shall, taking into

consideration information obtained during such hearing, and other relevant information which shall include any written comments submitted pursuant to the public notice specified in section 11-20-27(a):

(1) With respect to a variance or variance schedule, confirm, revise, or rescind the proposed variance or schedule as necessary; and

(2) With respect to an exemption schedule, confirm or revise the proposed schedule as necessary.

(b) The exemption schedule referred to in subsection (a)(2) shall require compliance by the public water system with each contaminant level and treatment technique requirement prescribed as state regulations comparable to:

(1) Interim national primary drinking water regulations promulgated by the administrator pursuant to 40 C.F.R. Part 141, by no later than January 1, 1984; and

(2) Revised national primary drinking water regulations promulgated by the administrator pursuant to 40 C.F.R. Part 141, by no later than seven years after the effective date of such regulations.

(c) If the public water system has entered into an enforceable agreement to become a part of a regional public water system, as determined by the director, the schedule referred to in subsection (a)(2) shall require compliance by the public water system with each contaminant level and treatment technique requirement prescribed by state rules comparable to:

(1) Interim national primary drinking water regulations promulgated by the administrator pursuant to 40 C.F.R. Part 141, by no later than January 1, 1986; and

(2) Revised national primary drinking water regulations promulgated by the administrator pursuant to 40 C.F.R. Part 141, by no later than nine years after the effective date of such regulations. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; am and comp 11/30/02; comp 12/16/05; comp] (Auth:

HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-3, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4, 300g-5; 40 C.F.R. Parts 141, 142, §141.4, §142.10, §142.20)

§11-20-29 Use of new sources of raw water for public water systems. (a) No person shall use a new source of raw water to supply a public water system unless the source and its treatment facilities, if any, have been approved by the director.

(b) Any person proposing to use a new raw water source to supply a public water system shall submit plans, supporting data, and information in an engineering report to the department. The engineering report shall be prepared by a licensed professional engineer, experienced in such fields as water resources, hydrogeology, water supply, or environmental engineering, and shall include the following:

(1) Identification of all significant factors having potential for contaminating or reducing the quality of the water source or which could cause the quality of water delivered to users of the public water system to be in violation of any state primary drinking water rule;

(2) Data relating to quality and quantity of the source waters under normal conditions and during stress periods, drought, or heavy precipitation, as determined by field and laboratory analyses and investigations of available records; if records are not available or are inadequate to determine source quality under stress conditions, an estimate of expected quality and quantity during stress conditions should be established;

(3) If the proposed new water source is a surface source, identification of the:

(A) Proximity and effects of sources of pollution and the possibility of contamination due to operation of waste treatment facilities or waste disposal systems, accidental spills of hazardous

materials, agricultural operations, and any other activities which could introduce contaminants into the water source;

(B) Factors affecting the time of travel of actual and potential pollution from its source to the water source;

(C) Actual and potential siltation problems; and

(D) Possible effects on water quality from existing or proposed upstream impoundments;

(4) If the proposed new water source is a well, spring, or infiltration gallery, identification of the:

(A) Nature of soil and stratum overlaying the water source, with special emphasis on identification of fissures and faults as it relates to the natural purification or treatment of percolating fluids from existing or future activities;

(B) Nature, distance, direction of flow and time of travel of contaminants from present and projected domestic, industrial, and agricultural sources of pollution, and waste injection wells and other waste disposal facilities; and

(C) The probability and effect of surface drainage or contaminated underground water entering the subject water source;

(5) For each present and projected potential source of contamination, identification and evaluation of alternative control measures which could be implemented to reduce or eliminate the potential for contamination of the water source, including treatment of the water source if subject to contamination, and evaluation of the physical, economic, and social effects of implementing such control measures;

(6) Certification by the person proposing to use the new source of raw water to supply a public water system that the new source of raw water and its

treatment system, if any, will be operated and maintained to provide water to the public water system that complies with state primary drinking water regulations. This requirement does not apply to new sources of raw water for the county department or board of water or water supply;

(7) Certification by the licensed professional engineer responsible for the preparation of the report, that the facts presented in the engineering report are true, to the best of the engineer's information and belief, and that the development of the new source of raw water, and the collection, treatment, and distribution of water from the new source of raw water and its treatment system, if any, are designed to supply water that will comply with state primary drinking water regulations. This requirement does not apply to engineering reports prepared by personnel in the county department or board of water or water supply;

(8) Where required by the director, the identification, qualifications, education, training, and work experience of the engineer and other individuals involved in the preparation of the engineering report; and

(9) Such other data and information as the director may require.

(c) In deciding whether to approve or deny the proposed use of a new source of raw water to supply a public water system, the director may:

(1) Require the person proposing to use the new water source to provide notice and opportunity for public comment on the proposed use of the new water source. If the director determines that a public hearing is warranted, the director may require the person proposing to use the new water source to publish the notice of a public hearing. The hearing shall be subject to the provisions of public notice and hearing provided in section 11-20-27. If a public hearing is required, the person proposing to use

the new water source shall pay all publication costs related to the public hearing(s) notification(s) for each water source requiring such notice;

(2) Consult with appropriate experts, state and county officials, including appointing a committee of such persons as the director may determine to be appropriate to advise the director in making his or her decision; or

(3) Take any other action which the director may determine to be appropriate to obtain adequate data and information on which to base his or her decision.

(d) The director may grant approvals with conditions that the director considers necessary to ensure that the water delivered to the public water system complies with state primary drinking water regulations or otherwise protects public health.

(e) Before the director approves the use of a new source of raw water to supply a new community public water system or a new non-transient non-community public water system, the proposed supplier of water shall demonstrate that the new public water system to be supplied by the new source of raw water has adequate capacity under section 11-20-29.5. Approvals for the use of a new source of raw water to supply a proposed public water system subject to section 11-20-30(d) shall be processed concurrently with the director's approval to construct the public water system and granted concurrently with the director's approval to use the public water system.

(f) A county department or board of water or water supply may submit to the director a program plan for the development by the county of new water sources for existing public water systems. Such plan shall be sufficiently detailed to include the basic information required by this section, with special attention paid to projections of future land use and other activities as they may affect the susceptibility of the water source to contamination. When approved in writing by the director, the requirements of such program, rather than those of subsections (a), (b), (c), and (d), shall govern the development of new sources of water for existing public water systems in that county

to the extent covered by that program.

(g) The director shall process written requests for approvals of new sources of raw water in a timely manner.

(1) The director shall decide whether an engineering report is complete within ninety days of receipt. The director shall notify the person proposing to use the new source of raw water to supply a public water system or its duly authorized representative in writing if the engineering report is incomplete or otherwise deficient and describe the additional information necessary to complete the report or correct the deficiency. Failure to provide the additional information or to correct a deficiency is sufficient ground to suspend or terminate the processing of the report;

(2) The director shall notify the person proposing to use the new source of raw water to supply a public water system or its duly authorized representative in writing when an engineering report is considered complete;

(3) The director shall act on a written request for a new source approval within one year from the date the director notifies the person proposing to use the new source of raw water to supply a public water system or its duly authorized representative that the engineering report is complete. This time period of one year may be extended to the extent of delays of the department's inspection of the raw water source and the public water system caused by the person proposing to use the new source of raw water or the supplier of water; and

(4) This subsection does not apply to the approval of new sources of raw water to supply a public water system subject to subsection (e).

(h) The person proposing to use the new source of raw water or its duly authorized representative shall notify the department in writing of changes which may affect the engineering report. Failure to provide such information shall be sufficient grounds for denial or termination of the processing of the request for a new

source approval. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-2.5, 340E-9) (Imp: HRS §§340E-2, 340E-2.5, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-9; 40 C.F.R. Parts 141, 142, §142.10)

§11-20-29.5 Capacity demonstration and evaluation. (a) To demonstrate adequate capacity, the proposed or existing supplier of water shall submit to the director, written information sufficient to show that the requirements in subsections (b) through (d) are met.

(b) A public water system with adequate technical capacity has at least the following items:

(1) A clear system description, including identification of plans and specifications, showing all water sources, infrastructure facilities, distribution systems, interconnections with other water systems, and protective measures against vandalism. Plans and specifications identified shall include those approved by the director, any as-built plans, originals, and modifications;

(2) Adequate water source(s), including:

(A) Sufficient water available to serve all customers or water users based on the public water system's average daily and peak water usage, and the system's treated water output;

(B) Sufficient water resources for the future, based on the maximum flow or pumping capacity of each source and a five year or more projected growth rate study which shall be submitted;

(C) Adequate protection of water source(s) or watershed(s), based on the identification of existing and potential contamination hazards as required under the source water protection program and a description of how a protective area will be maintained

around the source(s) or the watershed(s); and

(D) Contracts or agreements to obtain water when the water source(s) are not owned by the public water system, and contracts or agreements for supplementary water sources for systems affected by drought. The contracts and agreements shall be identified and copies shall be provided if requested by the director;

(3) Adequate technical performance, shown by the water system's actual or planned compliance with national and state primary drinking water regulations and any permit requirement;

(4) An adequate infrastructure replacement plan which includes estimates of the useful life and plans for the eventual replacement of the public water system's infrastructure, including:

(A) Wells;

(B) Pumping facilities;

(C) Storage tanks;

(D) Treatment facilities; and

(E) Distribution system (pipes, valves, meters, etc.);

(5) An adequate operation plan which shows that the public water system has:

(A) Established the appropriate operator certification level for the distribution and treatment systems and has hired or contracted, and designated appropriately certified primary and backup operators in sufficient numbers to operate the water system treatment and distribution systems at all necessary times;

(B) A program identifying the responsibilities, qualifications, and training requirements of the operations personnel;

(C) Adequate preventive and corrective maintenance program to identify, schedule, perform, and record inspections, repairs, and replacements in

a timely manner;

(D) An adequate water quality monitoring plan for its water source(s), treatment facilities, and distribution system for both compliance with national and state primary drinking water regulations and operational informational purposes; and

(E) Where necessary, the proper contract, agreements, or other documents establishing the use of a contractor to represent the public water system owner(s), operate and maintain the water system, or leasing land to locate infrastructure, or to obtain right-of-way easements;

(6) Adequate operator training, including:

(A) A program to qualify new and to educate existing water treatment plant and distribution system operators under HRS chapter 340F and its rules, including classes, on the job, and periodic refresher training; and

(B) A safety program which includes safety training on hazards that may be encountered by water treatment plant and distribution system operators, and periodic refresher training;

(7) A cross connection and backflow prevention program to ensure that there is an accurate inventory of backflow prevention devices throughout the public water system, and that devices are regularly tested and maintained; and

(8) A system to maintain and update plans of the public water system, including:

(A) All plans, specifications, modifications reviewed and approved by the director as described in section 11-20-30;

(B) Certification by a licensed professional engineer that the public water system was constructed or modified in accordance with the plans, specifications, and supporting

information which were previously reviewed and approved by the director for delivering water which will comply with the national and state primary drinking water regulations; and

(C) Certification by a licensed professional engineer that any deviations from the original plans are accurately recorded and noted on "as-built" plans, and approved by the director.

(c) A public water system with adequate managerial capacity has at least the following items:

(1) Clear organizational structure and communications, including:

(A) The name, title, telephone, and fax numbers of the manager responsible for policy decisions and the public water system's compliance with national and state primary drinking water regulations;

(B) A chart showing the organizational structure, the working relationships between personnel, and a summary of the primary duties and responsibilities of personnel;

(C) List of personnel, their positions, telephone and fax numbers, and any other means of communication; and

(D) Where contractors are hired to manage and operate the public water system, the information described in subparagraphs (B) and (C) shall also be provided on the contractor(s);

(2) Clear identification of the public water system ownership, including:

(A) The legal name, address, telephone, and fax numbers of the public water system owner(s); and

(B) The legal name, address, telephone, and fax numbers of the contractor(s) hired to manage and operate the public water system for the water system owner(s);

(3) An adequate information management system,

including:

(A) Procedures to collect, receive, and distribute necessary information quickly from and to public water system personnel, and where applicable, any contractor(s), and actual or potential users; and

(B) Procedures for filing, recordkeeping, tracking regulatory compliance, and implementation of programs;

(4) Qualified management and training, including:

(A) The manager and other key personnel have adequate qualifications, training, education, and work experience in managing and operating public water systems; and

(B) An adequate program to provide continuing training for managers to maintain their knowledge and skills, and to keep informed of issues affecting public water systems;

(5) Adequate emergency response plan which describes:

(A) Plausible emergencies;

(B) Abatement actions for each emergency described in subparagraph (A);

(C) Public notification procedures; and

(D) Identification of personnel and their specific responsibilities in each emergency situation;

(6) Adequate internal policies, including:

(A) A policy to inform customers or water users adequately about water quality as necessary, the public water system's operation as it may affect them, and the customers' or water users' duties, including any need for disinfection or alternate sources, cooperation with public water system personnel during service interruptions or emergencies, compliance with rules, help with water quality monitoring, water conservation, cross connection and backflow prevention, infrastructure changes, meter reading, rates, payment, and complaints;

(B) Design and construction standards for public water system modifications and repairs, and expansion, and internal review and inspection procedures for such work;

(C) Policies and procedures for keeping regulatory agencies and customers or water users informed of items such as water quality monitoring results, violations, disruption of water service, emergencies, infrastructure changes, and other problems;

(D) A policy for the development of budgets and rate structures; and

(E) A policy to seek information in a timely manner and use the information to adjust policies, plans, and programs appropriately.

(d) A public water system with adequate financial capacity has at least the following items:

(1) An adequate budget, including:

(A) Annual budgets that are prepared and approved by the water system owner(s) or its duly authorized representative for water system operation. A description of the budgeting process and copies of proposed and, if applicable, actual budgets, shall be provided; and

(B) Income and cash reserves adequate to pay annual operating expenses, unexpected significant repairs, and planned major work. Dedicated source(s) of income shall be identified;

(2) Adequate budget controls, including:

(A) Periodic performance reviews of actual expenditures and the annual budget;

(B) Procedures to safeguard financial assets; and

(C) Maintenance of detailed financial records which clearly identify the sources of income and the expenses involved in operating the public water system;

(3) Credit worthiness, including:
(A) Long term dedicated revenue projections which indicate that there will be sufficient revenue for operating and maintaining the public water system, performing anticipated repairs and replacement of major equipment, future expansion, and repayment of loans; and
(B) Credit report(s) which indicate that the public water system is financially healthy and credit worthy. [Eff and comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2.5, 340E-9)(Imp: HRS §§340E-2.5, 340E-9; 42U.S.C. §§300g-1, 300g-2, 300g-9)

§11-20-30 New and modified public water systems. (a) No new public water system shall be constructed or used to deliver water to any user and no existing public water system shall be substantially modified nor shall the substantial modification be used to deliver water to any user until the new public water system or the substantial modification has been approved by the director.

(1) Except for county owned systems using a surface water source or ground water under the direct influence of surface water source, the director may waive the approval required by this subsection for substantial modifications to existing county owned and operated public water systems when the appropriate county department or board of water or water supply has capability acceptable to the director to sample and analyze the water source and water to be delivered by the public water system such that the county department or board of water or water supply can satisfactorily demonstrate to the director that the public water system is capable of delivering water which will comply with the state primary drinking water regulations;
(2) For the purposes of this section, a "substantial modification" shall include, but not be limited

to, such things as any physical modification to the source, storage, collection, treatment, or distribution facilities of the public water system which is determined by the director to have an actual or potential significant impact on the quality of water delivered to users of the public water system; and

(3) Any person proposing physical modification to a public water system which increases the number of service connections or population served by the public water system shall consult with the director prior to commencement of such modification for a determination by the director whether the proposed modification is a "substantial modification" subject to the requirements of this section.

(b) A proposed or existing supplier of water or its duly authorized representative shall demonstrate that the new or modified public water system will deliver water in compliance with state primary drinking water regulations before construction. A proposed or existing supplier of water or its duly authorized representative shall provide the following information:

(1) Plans, specifications, supporting information, and documents detailing the design and location of the proposed new public water system or the existing public water system and the proposed substantial modifications;

(2) Documents and supporting information on the raw water source(s) and proposed treatment, if any, demonstrating that the source(s) of raw water to supply the public water system complies with state primary drinking water regulations. Where a new source of raw water is proposed to supply a public water system, the documents must demonstrate that the new source of raw water complies with section 11-20-29;

(3) Documents and information demonstrating that the public water system will be adequately operated and maintained;

(4) Documents and information demonstrating that the new public water system or substantial

modifications to an existing public water system will be located and constructed in conformance with all applicable State of Hawaii laws and county ordinances relating to floods, tsunamis, earthquakes, and fires. To the extent practicable, part or all of the new or substantially modified existing facility shall avoid any site which is subject to a significant risk from earthquakes, floods, tsunamis, fires, or other disasters which could cause a breakdown of the public water system or a portion thereof or which is, except for intake structures, within the floodplain of a hundred-year flood or is lower than any recorded high tide where appropriate records exist;

(5) Certification by the licensed professional engineer(s) responsible for the preparation of the plans and specifications for the new public water system or the substantial modifications to the existing public water system, and the operation and maintenance documents, that the water system or the modifications have been designed to deliver water that will comply with state primary drinking water regulations. This certification is not required for plans and specifications prepared by personnel in the county department or board of water or water supply, in compliance with applicable county department or board of water or water supply rules, regulations, and standards;

(6) Certification by the proposed or existing supplier of water that the public water system will be operated and maintained to provide water in compliance with state primary drinking water regulations. This certification is not required for new or modified public water systems owned and operated by the county department or board of water or water supply; and

(7) Other information, including testing or inspections, as the director considers necessary to decide on whether to grant approval

to construct.

(c) After construction has been completed, the new public water system or substantial modifications to an existing public water system shall not be used to deliver water to any user until approved by the director. The supplier of water or its duly authorized representative shall provide the following:

(1) A detailed description of the changes made from the planned system or modification approved by the director and analysis of the effect, if any, that the changes will have on the quality of water delivered by the new or modified public water system and compliance with primary drinking water regulations, certified by a licensed professional engineer; and

(2) Other information, including testing or inspections, as the director considers necessary to approve of the changes or evaluate the need for corrective actions.

(d) For approval of a new community public water system or a new non-transient non-community public water system, required under subsection (a), before construction or use of the system, the proposed supplier of water or its duly authorized representative shall comply with the requirements of subsection (b) and demonstrate to the director's satisfaction that the proposed system has adequate capacity as described in section 11-20-29.5.

(1) A new community public water system or new non-transient non-community public water system shall include:

(A) Newly constructed community public water systems or non-transient non-community public water systems; and

(B) Water systems that do not currently meet the definition of a public water system as defined in section 11-20-2 but which expand their infrastructure and thereby grow to become a community public water system or a non-transient non-community public water system; and

(2) A demonstration of adequate capacity under

section 11-20-29.5 shall include the obtaining of the director's approval of any new sources of raw water as described in section 11-20-29.

(e) For approval of a new transient non-community public water system or substantial modification of an existing public water system, which has failed to comply with state primary drinking water regulations or has significant problems noted by sanitary surveys or inspections, required under subsection (a), the proposed or existing supplier of water may, at the director's discretion, also be required to demonstrate to the director's satisfaction that the system has adequate capacity as described in section 11-20-29.5.

(f) Before granting approval of the construction or use of the new public water system or substantial modifications to an existing public water system, the director may:

(1) Conduct inspections, before, during, and after construction or implementation as deemed appropriate by the director;

(2) Require the proposed or existing supplier of water or its duly authorized representative to perform sampling, and testing as deemed appropriate to determine the ability of the new or substantially modified public water system to deliver water that complies with state primary drinking water regulations;

(3) Review the ability of the source(s) of raw water and treatment, if any, to supply water to the new or substantially modified public water system in compliance with state primary drinking water regulations; and

(4) Impose conditions, such as monitoring or operating requirements or restrictions, as deemed appropriate by the director to ensure that the water delivered meets state primary drinking water regulations.

(g) The director shall process written requests for approval of the construction or use of new public water systems or proposed substantial modifications to existing public water systems in a timely manner.

(1) The director shall notify the proposed or

existing supplier of water or its duly authorized representative whether the written request for preconstruction approval is complete within one-hundred eighty days of receipt.

(2) The director shall notify the proposed or existing supplier of water or its duly authorized representative whether a written request for postconstruction and pre-use approval is complete within sixty days of receipt.

(3) If the director finds a written request for preconstruction or postconstruction and pre-use approval is incomplete or otherwise deficient, the director shall describe the additional information necessary to complete the written request or correct the deficiency. Failure to provide the additional information or to correct the deficiency is sufficient grounds to suspend or terminate review of the written request for preconstruction or postconstruction and pre-use approval.

(4) The director shall act on a written request for preconstruction approval within one year from the date the director notifies the proposed or existing supplier of water or its duly authorized representative that the written request was considered complete.

(5) The director shall act on a written request for postconstruction and pre-use approval within sixty days from the date the director notifies the proposed or existing supplier of water or its duly authorized representative that the written request was considered complete.

(6) The director may extend the deadline for postconstruction and pre-use approval to the extent of delays in inspections, sampling, testing, or providing information requested or to be conducted by the department and caused by the proposed or existing supplier of water or its duly authorized representative.

(7) This subsection does not apply to approvals of

public water systems subject to subsection (d).

(h) The proposed or existing supplier of water or its duly authorized representative shall notify the department in writing of changes which may affect the director's decision to approve the construction or use of a new public water system or a substantial modification of a public water system. Failure to provide such information shall be sufficient grounds for denial or termination of the plan review. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; am and comp 9/7/99; comp 11/30/02; am and comp 12/16/05; comp NOV 2 8 2011] (Auth: HRS §§340E-2, 340E-2.5, 340E-9) (Imp: HRS §§340E-2, 340E-2.5, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-9; 40 C.F.R. Parts 141, 142, §141.5, §142.10)

§11-20-31 Use of trucks to deliver drinking water. (a) Before any person, other than a county department or board of water or water supply, may use a truck to deliver drinking water to supply a public water system, such person shall first notify the director and shall comply with procedures specified by the director to ensure that the water to be delivered will not endanger the health of users of the water. Such procedures may relate to design and construction of the tank used to carry the water, the prior use of the tank, cleaning and disinfecting the tank, monitoring of the quality of water delivered by the truck, or other appropriate requirements.

(b) The director may waive, with appropriate conditions, the requirement of notification in subsection (a) for a person who proposes to use a truck to deliver drinking water to supply a public water system on a regular basis, if satisfactory assurances are given that he or she will comply with procedures acceptable to the director to ensure that the water to be delivered will not endanger the health of users. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; am and comp 12/16/05; comp NOV 2 8 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.5, §142.10)

§11-20-32 Penalties and remedies. Any person who violates any provision of this chapter, or any variance or exemption issued pursuant thereto, shall be subject to enforcement action by the director pursuant to section 340E-8, HRS. [Eff 12/26/81; comp 3/7/92; comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-7, 340E-8, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §142.10)

§11-20-33 Entry and inspection. The director shall have the right:

(1) To enter premises on which any public water system is located;
(2) To inspect any equipment, operation, or sampling of any public water system;
(3) To take water samples from any public water system; and
(4) To have access to and copy any record required to be kept pursuant to this chapter. [Eff 12/26/81; am and comp 3/7/92; comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2, 300g-4; 40 C.F.R. Parts 141, 142, §142.10)

§11-20-34 Special monitoring for sodium.

(a) Suppliers of water for community public water systems shall collect and analyze one sample per plant at the entry point of the distribution system for the determination of sodium concentration levels; samples shall be collected and analyzed annually for public water systems utilizing solely surface water sources in whole or in part, and at least every three years for public water systems utilizing ground water sources. The minimum number of samples required to be taken by the public water system shall be

based on the number of treatment plants used by the public water system, except that multiple wells drawing raw water from a single aquifer may, with the director's approval, be considered one treatment plant for determining the minimum number of samples. The supplier of water may be required by the director to collect and analyze water samples for sodium more frequently in locations where the sodium content is variable.

(b) The supplier of water shall report to the director the results of the analyses for sodium within the first ten days of the month following the month in which the sample results were received or within the first ten days following the end of the required monitoring period as stipulated by the director, whichever of these is first. If more than annual sampling is required, the supplier shall report the average sodium concentration within ten 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 supplier of water shall notify appropriate local and state 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 paragraph shall be sent to the director within ten days of its issuance.

(d) Analyses for sodium shall be performed by the methods specified in 40 C.F.R. §141.23(k)(1). [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.41, §142.10)

§11-20-35 Special monitoring for corrosivity characteristics. (a) (Reserved)

(b) (Reserved)

(c) (Reserved)

(d) Community water supply systems shall identify whether the following construction materials are present in their distribution system and report to the department:

(1) Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing;
(2) Copper from piping and alloys, service lines, and home plumbing;
(3) Galvanized piping, service lines, and home plumbing;
(4) Ferrous piping materials such as cast iron and steel;
(5) Asbestos cement pipe; and
(6) In addition, the director may require identification and reporting of other materials of construction present in distribution systems that may contribute contaminants to the drinking water, such as:
(A) Vinyl lined asbestos cement pipe; and
(B) Coal tar lined pipes and tanks. [Eff 12/26/81; am and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.42, §142.10)

§11-20-36 Reporting and public notification for certain unregulated contaminants. (a) The requirements of this section apply only to owners and operators of a public water system required to monitor for unregulated contaminants under 40 C.F.R. §141.40.

(b) Public water systems monitoring for unregulated contaminants under 40 C.F.R. §141.40 must comply with the reporting of unregulated contaminant monitoring results requirements under 40 C.F.R. §141.35. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; am and comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-3, 300j-4, 300g-6, 40 C.F.R. Parts 141, 142, §§141.35)

§11-20-37 REPEALED. [R 11/30/02]

§11-20-38 Additives. (a) No supplier of water shall directly or indirectly add any chemical, material, or product to the drinking water supplied by a public water systems unless the chemical, material, or product has been tested and certified as meeting the specifications of American National Standards Institute/National Sanitation Foundation Standard 60, Drinking Water Treatment Chemicals - Health Effects. This requirement shall be met under testing conducted by a product certification organization accredited for this purpose by the American National Standards Institute.

(b) A supplier of water may use a chemical, material, or product that has not been certified as described in subsection (a) if the director finds that the use will not pose an adverse risk to public health and:

(1) There are no certified alternatives available; or

(2) The chemical, material, or product is in the process of being tested and certified and there are no certified alternatives available.

(c) Prior to using an uncertified chemical, material, or product the supplier of water shall submit to the director:

(1) A detailed explanation of the need for the chemical, material, or product;

(2) The date the chemical, material, or product was submitted for testing;

(3) Where applicable, the name of the accredited product certification organization conducting the testing;

(4) A statement that certified alternatives are not available; and

(5) Any other information deemed necessary by the director.

(d) The use of any chemical, material, or product in drinking water treatment or supply shall conform to the manufacturer's instructions or recommendations for use,

maximum dosage, application rates, installation, restrictions, and any other conditions imposed by the product certification organization accredited by the American National Standards Institute or the director. [Eff 12/26/81; am, ren §11-20-38 and comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; am and comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §340E-9) (Imp: HRS §340E-2)

§11-20-39 Time requirements. (a) Suppliers of community public water systems shall comply with section 11-20-34 monitoring requirements by February 27, 1982. Said suppliers shall complete the first round of sampling and reporting by August 27, 1981.

(b) Suppliers of community public water systems shall comply with section 11-20-35 monitoring requirements by February 27, 1982. Said suppliers shall comply completely with all requirements in section 11-20-35 by August 27, 1983.

(c) All other duties imposed by this chapter apply immediately. [Eff 12/26/81; am, ren §11-20-39, and comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §141.6, §142.10)

§11-20-40 Criteria and procedures for public water systems using point-of-entry devices. (a) Supplier of water may use point-of-entry devices to comply with MCLs only if they meet all the requirements of this section.

(b) The supplier of water has the responsibility to operate and maintain the point-of-entry treatment system.

(c) The supplier of water shall develop and obtain the director's approval for a monitoring plan before point-of-entry devices are installed for compliance. Under the plan approved by the director, point-of-entry devices shall provide health protection equivalent to central water treatment. "Equivalent" means that the

water would meet all primary drinking water regulations and would be of acceptable quality similar to water distributed by a well-operated central treatment plant. In addition to the VOCs, monitoring shall include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

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

(1) The supplier of water shall provide certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices to the director.

(2) The design and application of the point-of-entry devices shall consider the tendency for increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent backwashing, post-contactor disinfection, and Heterotrophic Plate Count monitoring to ensure that the microbiological safety of the water is not compromised.

(e) All consumers shall be protected. Every building connected to the public water system shall have a point-of-entry device installed, maintained, and adequately monitored. Every building shall be subject to treatment and monitoring, and that the rights and responsibilities of the public water system customer shall convey with title upon sale of property. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-3, 300j-4, 300g-6, 300j-9; 40 C.F.R. Parts 141, 142, §141.100)

§11-20-41 Use of other non-centralized treatment devices. The supplier of water 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. [Eff 12/26/81; comp 3/7/92; comp 1/2/93; comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-3, 300j-4, 300g-6, 300j-9; 40 C.F.R. Parts 141, 142, §141.101)

§11-20-42 Bottled water and point-of-use devices. (a) The director may require the supplier of water to use bottled water or point-of-use devices as a condition for granting an exemption from the requirements of section 11-20-4(d).

(b) The supplier of water that uses bottled water as a condition of obtaining an exemption from the requirements of section 11-20-4(d) shall meet the requirements set out in section 11-20-43(f).

(c) The supplier of water that uses point-of-use devices as a condition for receiving an exemption shall meet the requirements set out in section 11-20-43(g). [Eff 12/26/81; comp 3/7/92; comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-3, 300j-4, 300g-6, 300j-9; 40 C.F.R. Parts 141, 142, §142.56)

§11-20-43 Variances from the maximum contaminant levels for synthetic organic chemicals. (a) The following is the best technology, treatment techniques, or other means available for achieving compliance with the MCLs for synthetic organic chemicals: Removal using packed tower aeration; removal using granular activated carbon (except for vinyl chloride).

(b) Community water systems and non-transient non-community water systems shall agree to install or use any treatment method identified in subsection (a), or both, as a condition for granting a variance except as provided in subsection (c). If, after the supplier of water's installation of the treatment method, the public

water system cannot meet the MCL, that supplier of water shall be eligible for a variance under the provisions of section 11-20-20.

(c) If a supplier of water can demonstrate through comprehensive engineering assessments, which may include pilot plant studies, that the treatment methods identified in subsection (a) would only achieve a de minimis reduction in contaminants, the director may issue a schedule of compliance that requires the supplier of water being granted the variance to examine other treatment methods as a condition of obtaining the variance.

(d) If the director determines that a treatment method identified in subsection (c) is technically feasible, the director may require the supplier of water to install or use that treatment method, or both, in connection with a compliance schedule issued under the provisions of section 11-20-26. The director's determination shall be based upon studies by the supplier of water and other relevant information.

(e) The director may require a supplier of water to use bottled water or point-of-use devices or other means as a condition of granting a variance or an exemption from the requirements of section 11-20-4(d), to avoid an unreasonable risk to health.

(f) The supplier of water that uses bottled water as a condition for receiving a variance or an exemption from the requirements of section 11-20-4(d) is fully responsible for the provision of a minimum quantity of bottled water to every person via door-to-door bottled water delivery and shall meet the requirements in either paragraph (1) or (2) below:

(1) The director shall require and approve a monitoring program for bottled water. The supplier of water shall develop and put in place a monitoring program that provides reasonable assurances that the bottled water meets all MCLs. The supplier of water shall monitor a representative sample of the bottled water for all contaminants regulated under section 11-20-4(d) the first three months that it supplies the bottled water to the public, and annually thereafter. Results of the

monitoring program shall be provided to the director; or

(2) The supplier of water shall obtain a certification from the bottled water company that the bottled water supplied has been taken from an "approved source" as defined in 21 C.F.R.§129.3(a); the bottled water company has conducted monitoring in accordance with 21 C.F.R. §129.80(g)(1) through (3); and the bottled water does not exceed any MCLs or quality limits as set out in 21 C.F.R. §103.35, 110, and 129. The supplier of water shall provide the certification to the director the first three months after it supplies bottled water and annually thereafter.

(g) The supplier of water that uses point-of-use devices as a condition for obtaining a variance or an exemption from NPDWRs for volatile organic compounds shall meet the following requirements:

(1) The supplier of water has the responsibility to operate and maintain the point-of-use treatment system;

(2) The supplier of water shall develop a monitoring plan and obtain the director's approval for the plan before point-of-use devices are installed for compliance. This monitoring plan shall provide health protection equivalent to a monitoring plan for central water treatment;

(3) Effective technology shall be properly applied under a plan approved by the director and the microbiological safety of the water shall be maintained;

(4) The supplier of water shall provide certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-use devices to the director;

(5) The design and application of the point-of-use devices shall consider the tendency for an increase in heterotrophic bacteria concentrations in water treated with activated carbon. It may be necessary to use frequent

backwashing, post-contactor disinfection, and Heterotrophic Plate Count monitoring to ensure that the microbiological safety of the water is not compromised; and

(6) All consumers shall be protected. Every building connected to the public water system shall have a point-of-use device installed, maintained, and adequately monitored. Every building is subject to treatment and monitoring, and that the rights and responsibilities of the public water system customer shall convey with title upon sale of property. [Eff 12/26/81; comp 3/7/92; am and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-3, 300j-4, 300g-6, 300j-9; 40 C.F.R. Parts 141, 142, §142.62)

§11-20-44 REPEALED. [R 1/2/93]

§11-20-45 REPEALED. [R NOV 28 2011]

§11-20-45.1 Disinfectant residuals, disinfection byproducts, and disinfection byproduct precursors. (a) General requirements.

(1) The requirements of this section constitute state primary drinking water regulations.

(A) The regulations in this section establish criteria under which community water systems (CWSs) and nontransient, non-community water systems (NTNCWSs) which add a chemical disinfectant to the water in any part of the drinking water treatment process must modify their practices to meet MCLs and MRDLs in sections 11-20-4.1 and 11-20-7.5, respectively, and must meet the treatment

technique requirements for disinfection byproduct precursors in subsection (f).

(B) The regulations in this section establish criteria under which transient NCWSs that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the MRDL for chlorine dioxide in section 11-20-7.5.

(2) Compliance dates.

(A) CWSs and NTNCWSs. Unless otherwise noted, systems must comply with the requirements of this section as follows. Public water systems with a surface water source or a GWUDI source serving 10,000 or more persons must comply with this section beginning January 1, 2002. Public water systems with a surface water source or a GWUDI source serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water must comply with this section beginning January 1, 2004.

(B) Transient NCWSs. Public water systems with a surface water source or a GWUDI source serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this section beginning January 1, 2002. Public water systems with a surface water source or a GWUDI source serving fewer than 10,000 persons and using chlorine dioxide as a disinfectant or oxidant and systems using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this section beginning January 1, 2004.

(3) Each CWS and NTNCWS regulated under paragraph (1) must be operated by qualified personnel who meet the requirements specified by the director

and are included in a state register of qualified operators.

(4) Control of disinfectant residuals. Notwithstanding the MRDLs in section 11-20-7.5, systems may increase residual disinfectant levels in the distribution system of chlorine or chloramines (but not chlorine dioxide) to a level and for a time necessary to protect public health, i.e., to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(b) Analytical requirements.

(1) General.

(A) Systems must use only the analytical method(s) specified in this subsection, or their equivalent as approved by EPA, to demonstrate compliance with the requirements of this section and with the requirements of sections 11-20-45.2 and 11-20-45.3. These methods are effective for compliance monitoring beginning on February 16, 1999, unless a different effective date is specified in this section or by the director.

(B) Documents on analytical methods incorporated by reference into this subsection per 5 U.S.C. 552(a) and 1 C.F.R. part 51 are listed in 40 C.F.R. 141.131(a)(2).

(2) Disinfection byproducts.

(A) Systems must measure disinfection byproducts by the methods listed in 40 C.F.R. 141.131(b)(1) or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C.

(B) Analysis under this section for disinfection byproducts must be conducted by laboratories that have received

certification by EPA or the director, except as specified under subparagraph (C). To receive certification to conduct analyses for the DBP contaminants in section 11-20-4.1(a), 11-20-45.1(f), 11-20-45.2 and 11-20-45.3, the laboratory must meet 40 C.F.R. 141.131(b)(2)(i - iv).

(C) A party approved by EPA or the director must measure daily chlorite samples at the entrance to the distribution system.

(3) Disinfectant residuals.

(A) Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in 40 C.F.R. 141.131(c)(1) or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C.

(B) If approved by the director, systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits.

(C) A party approved by EPA or the director must measure residual disinfectant concentration.

(4) Additional analytical methods. Systems required to analyze parameters not included in paragraphs (2) and (3) must use the following methods or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C. A party approved by EPA or the director must measure these parameters.

(A) Alkalinity. All methods allowed in 40 C.F.R. 141.89(a) for measuring alkalinity.

(B) Bromide. EPA Method 300.0 or EPA Method 300.1, 317.0 Revision 2.0, 326.0, or ASTM D 6581-00.

(C) Total Organic Carbon (TOC). Standard

Method 5310 B or 5310 B-00_ (High-Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00_ (Wet-Oxidation Method) or EPA Method 415.3 Revision 1.1. Inorganic carbon must be removed from the samples prior to analysis. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within twenty-eight days.

(D) Specific Ultraviolet Absorbance (SUVA). SUVA is equal to the UV absorption at 254nm (UV_{254}) (measured in m^{-1}) divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV_{254} and DOC. When determining SUVA, systems must use the methods stipulated in this subparagraph to measure DOC and the method stipulated in this subparagraph to measure UV_{254}. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and UV_{254} samples used to determine a SUVA value must be taken at the same time and at the same location.

(i) Dissolved Organic Carbon (DOC). Standard Method 5310 B or 5310 B-00 (High-Temperature Combustion Method) or Standard Method 5310 C or 5310 C-00 (Persulfate-Ultraviolet or Heated-Persulfate Oxidation Method) or Standard Method 5310 D or 5310 D-00 (Wet-Oxidation Method) or EPA Method 415.3 Revision 1.1. DOC samples

must be filtered through the 0.45 um pore diameter filter as soon as practical after sampling, not to exceed forty-eight hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within twenty-eight days of sample collection. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet the following criteria: DOC less than 0.5 mg/L.

(ii) Ultraviolet Absorption at 254 nm (UV_{254}). Method 5910 B or 5910 B-00 (Ultraviolet Absorption Method) or EPA Method 415.3 Revision 1.1. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV_{254} samples must be filtered through a 0.45 um pore-diameter filter. The pH of UV_{254} samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed forty-eight hours.

(E) pH. All methods allowed in 40 C.F.R 141.23(k)(1) for measuring pH.

(F) Magnesium. All methods allowed in 40 C.F.R. 141.23(k)(1) for measuring magnesium.

(c) Monitoring requirements.

(1) General requirements.

(A) Systems must take all samples during normal operating conditions.

(B) Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with director approval. Systems shall submit an evaluation report by a professional competent in the field of hydrogeology which proves with reasonable certainty that the affected wells are completed in, and drawing water from, the same aquifer, and that the water quality characteristics/chemistry of each well are enough alike to conclude that disinfection byproduct formation would be similar. Aquifer boundaries and designations shall be based on maps of the State Commission on Water Resource Management.

(C) Failure to monitor in accordance with the monitoring plan required under paragraph (6) is a monitoring violation.

(D) Failure to monitor will be treated as a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MCLs or MRDLs.

(E) Systems may use only data collected under the provisions of this subsection or 40 C.F.R. subpart M to qualify for reduced monitoring.

(2) Monitoring requirements for disinfection byproducts.

(A) TTHMs and HAA5.

(i) Routine monitoring. Systems must monitor at the frequency indicated in Appendix B entitled "Routine Monitoring Frequency For TTHM and

HAA5 (HAR 11-20-45.1(c)(2)(A))", dated January 1, 2002, located at the end of this chapter and made a part of this section.

(ii) Systems may reduce monitoring, except as otherwise provided, in accordance with Appendix C entitled "Reduced Monitoring Frequency For TTHM and HAA5 (HAR 11-20-45.1(c)(2)(B))", dated January 1, 2002, located at the end of this chapter and made a part of this section.

(iii) Monitoring requirements for source water TOC. In order to qualify for reduced monitoring for TTHM and HAA5 under clause (ii), Subpart H systems not monitoring under the provisions of paragraph (c)(4) must take monthly TOC samples every thirty days at a location prior to any treatment, beginning April 1, 2008 or earlier, if specified by the director. In addition to meeting other criteria for reduced monitoring in clause (ii), the source water TOC running annual average must be <4.0 mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5 under clause (ii), a system may reduce source water tOC monitoring to quarterly TOC samples taken every ninety days at a location prior to any treatment.

(iv) Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for

systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. Systems that do not meet these levels must resume monitoring at the minimum frequency identified in Appendix B (minimum monitoring frequency column) in the quarter immediately following the monitoring period in which the system exceeds 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively. For systems using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is>0.080 mg/L or the HAA5 annual average is >0.060 mg/L, the system must go to the increased monitoring identified in Appendix B (sample location column) in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L or 0.060 mg/L for TTHMs or HAA5 respectively.

(v) Systems on increased monitoring may return to routine monitoring if, after at least one year of monitoring their TTHM annual average is $\leq$0.060 mg/L and their HAA5 annual average is $\leq$0.045 mg/L.

(vi) The director may return a system to routine monitoring at the director's discretion.

(B) Chlorite. Community and nontransient non-community water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite.

(i) Routine daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by clause (iii) in addition to the sample required at the entrance to the distribution system.

(ii) Routine monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted under clause (iii) to meet the requirement for monitoring under this clause.

(iii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum

residence time in the distribution system).

(iv) Reduced monitoring at entrance to distribution system. Chlorite monitoring at the entrance to the distribution system required by clause (i) may not be reduced.

(v) Reduced monitoring in distribution system. Chlorite monitoring in the distribution system required by clause (ii) may be reduced to one three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under clause (ii) has exceeded the chlorite MCL and the system has not been required to conduct monitoring under clause (iii). The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under clause (ii) exceeds the chlorite MCL or the system is required to conduct monitoring under clause (iii), at which time the system must revert to routine monitoring.

(C) Bromate.

(i) Routine monitoring. Community and nontransient non-community systems using ozone, for disinfection or oxidation, must take one sample per month for each treatment plant in the system using ozone. Systems must take samples monthly at the entrance to the distribution system while the ozonation system is operating under normal conditions.

(ii) Reduced monitoring. Until March 31, 2009, systems required to analyze for bromate may reduce monitoring from

monthly to quarterly, if the system's average source water bromide concentration is less than 0.05 mg/L based on representative monthly bromide measurements for one year. The system may remain on reduced bromate monitoring until the running annual average source water bromide concentration, computed quarterly, is equal to or greater than 0.05 mg/L based upon representative monthly measurements. If the running annual average source water bromide concentration is equal to or greater than 0.05 mg/L, the system must resume routine monitoring required by clause (i) in the following month. Beginning April 1, 2009, systems may no longer use the provisions of this clause to qualify for reduced monitoring. A system required to analyze for bromate may reduce monitoring from monthly to quarterly, if the system's running annual average bromate concentration is <0.0025 mg/L based on monthly bromate measurements under clause (i) for the most recent four quarters, with samples analyzed using Method 317.0 Revision 2.0, 326.0 or 321.8. If the running annual average bromate concentration is >0.0025 mg/L, the system must resume routine monitoring required by clause (i).

(3) Monitoring requirements for disinfectant residuals.

(A) Chlorine and chloramines.

(i) Routine monitoring. Community and nontransient non-community water systems that use chlorine or chloramines must measure the

residual disinfectant level in the distribution system at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in section 11-20-9. Public water systems which filter either a surface water source or a GWUDI source may use the results of residual disinfectant concentration sampling conducted under section 11-20-46(d)(2)(B)(ii), in lieu of taking separate samples.

(ii) Reduced monitoring. Monitoring may not be reduced.

(B) Chlorine dioxide.

(i) Routine monitoring. Community, nontransient non-community, and transient non-community water systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by clause (ii), in addition to the sample required at the entrance to the distribution system.

(ii) Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, a system covered by this paragraph is required to take three chlorine dioxide distribution system samples. If chlorine dioxide or chloramines are used to maintain a disinfectant residual in the distribution system, or if chlorine is used to maintain a disinfectant residual in the distribution system

and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system). All sampling locations shall be approved by the director.

(iii) Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

(4) Monitoring requirements for disinfection byproduct precursors (DBPP).

(A) Routine monitoring. Public water systems with a surface water source or a GWUDI source which use conventional filtration treatment (as defined in section 11-20-2) must monitor each treatment plant for TOC no later than the point of combined filter effluent turbidity monitoring and representative of the treated water. All systems required to monitor under this subparagraph must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to

as paired samples. At the same time as the source water sample is taken, all affected systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired sample and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

(B) Reduced monitoring. Public water systems with a surface water source or a GWUDI source with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, may reduce monitoring for both TOC and alkalinity to one paired sample and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC is equal to or greater than 2.0 mg/L.

(5) Bromide. Systems required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

(6) Monitoring plans. Each system required to monitor under this subsection must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the director and the general public no later than thirty days following the applicable compliance dates in subsection (a)(2). All public water systems with a surface water source or a GWUDI source serving more than 3,300 people must submit a copy of the monitoring plan to the director no later than

the date of the first report required under subsection (e). The director may also require the plan to be submitted by any other system. After review, the director may require changes in any plan elements. The plan must include at least the following elements:

(A) Specific locations and schedules for collecting samples for any parameters included in this section.

(B) How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

(C) If approved for monitoring as a consecutive system, or if providing water to a consecutive system, under the provisions of section 11-20-16, the sampling plan must reflect the entire distribution system.

(d) Compliance requirements.

(1) General requirements.

(A) Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average. Where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

(B) All samples taken and analyzed under the provisions of this section must be included in determining compliance, even if that number is greater than the minimum required.

(C) If, during the first year of monitoring

under subsection (c), any individual quarter's average will cause the running annual average of that system to exceed the MCL for total trihalomethanes, haloacetic acids (five), or bromate; or the MRDL for chlorine or chloramine, the system is out of compliance at the end of that quarter.

(2) Disinfection byproducts.

(A) TTHMs and HAA5.

(i) For systems monitoring quarterly, compliance with MCLs in section 11-20-4.1 must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by subsections (c)(2)(A).

(ii) For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of subsection (c)(2)(A) does not exceed the MCLs in section 11-20.4.1. If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and such a system is not in violation of the MCL until it has completed one year of quarterly monitoring , unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase monitoring frequency to quarterly monitoring must calculate compliance by including the sample which triggered the increased monitoring plus the following three quarters of monitoring.

(iii) If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to Section 11-20-18 or 40 C.F.R. Sec. 141.202, whichever is effective for your system, in addition to reporting to the director pursuant to subsection (e).

(iv) If a PWS fails to complete four consecutive quarters of monitoring (i.e., when the PWS has not been operating for four quarters), compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(B) Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by subsection (c)(2)(C). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to section 11-20-18, in addition to reporting to the director pursuant to subsection (e). If a PWS fails to complete twelve consecutive months of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(C) Chlorite. Compliance must be based on an arithmetic average of each three sample set taken in the distribution system as prescribed by subsection (c)(2)(B)(ii)

and (iii). If the arithmetic average of any three sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to section 11-20-18, in addition to reporting to the director pursuant to subsection (e).

(3) Disinfectant residuals.

(A) Chlorine and chloramines.

(i) Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under subsection (c)(3)(A). If the average covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to section 11-20-18, in addition to reporting to the director pursuant to subsection (e).

(ii) In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to subsection (e) must clearly indicate which residual disinfectant was analyzed for each sample.

(B) Chlorine dioxide.

(i) Acute violations. Compliance must be based on consecutive daily samples collected by the system under subsection (c)(3)(B). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one (or more) of the three samples taken in the distribution system exceed the

MRDL, the system is in violation of the MRDL and must take immediate corrective action to lower the level of chlorine dioxide below the MRDL and must notify the public pursuant to the procedures for acute health risks in section 11-20-18(b)(2)(D) in addition to reporting to the director pursuant to subsection (e). Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for acute violations in section 11-20-18(b)(2)(D) in addition to reporting to the director pursuant to subsection (e).

(ii) Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under subsection (c)(3)(B). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the procedures for nonacute health risks in section 11-20-18 in addition to reporting to the director pursuant to subsection (e). Failure to monitor at the entrance to the distribution system the day following an exceedance of the chlorine dioxide MRDL at the

entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for nonacute violations under section 11-20-18 in addition to reporting to the director pursuant to subsection (e).

(4) Disinfection byproduct precursors (DBPP). Compliance must be determined as specified by subsection (f)(3). Systems may begin monitoring to determine whether Step 1 TOC removals can be met twelve months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period, and then determines in the first twelve months after the compliance date that it is not able to meet the Step 1 requirements in subsection (f)(2)(B) and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to subsection (f)(2)(C) and is in violation of a treatment technique under subsection (f). Systems may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under subsection (f)(3)(A)(iv) is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to section 11-20-18, in addition to reporting to the director pursuant to subsection (e).

(e) Reporting and record keeping requirements.

(1) Systems required to sample quarterly or more frequently, pursuant to this subsection shall report to the director within ten days after the end of each quarter in which samples were

collected, notwithstanding the provisions of section 11-20-17. Systems required to sample less frequently than quarterly must report to the director within ten days after the end of each monitoring period in which samples were collected.

(2) Disinfection byproducts. Systems must report the information specified in Appendix D entitled "Reporting Requirements For Disinfection Byproducts (HAR 11-20-45.1(e)(2))", dated January 1, 2002, located at the end of this chapter and made a part of this section.

(3) Disinfectants. Systems must report the information specified in Appendix E entitled "Reporting Requirements For Disinfection Residuals (HAR 11-20-45.1(e)(3))", dated January 1, 2002, located at the end of this chapter and made a part of this section.

(4) Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in Appendix F entitled "Reporting Requirements For Disinfection Byproduct Precursors and Enhanced Coagulation or Enhanced Softening (HAR 11-20-45.1(e)(4))", dated January 1, 2002, located at the end of this chapter and made a part of this section.

(f) Treatment technique for control of disinfection byproduct (DBP) precursors.

(1) Applicability.

(A) Public water systems with a surface water source or a GWUDI source using conventional filtration treatment (as defined in section 11-20-2) must operate with enhanced coagulation or enhanced softening to achieve the TOC per cent removal levels specified in paragraph (2) unless the system meets at least one of the alternative compliance criteria listed in subparagraphs (B) or (C).

(B) Alternative compliance criteria for

enhanced coagulation and enhanced softening systems. Public water systems with a surface water source or a GWUDI source using conventional filtration treatment may use the alternative compliance criteria in this subparagraph to comply with this subsection in lieu of complying with paragraph (2). Systems shall still comply with monitoring requirements in subsection (c)(4).

(i) The system's source water TOC level, measured according to subsection (b)(4)(C), is less than 2.0 mg/L, calculated quarterly as a running annual average.

(ii) The system's treated water TOC level, measured according to subsection (b)(4)(C), is less than 2.0 mg/L, calculated quarterly as a running annual average.

(iii) The system's source water TOC level, measured according to subsection (b)(4)(C), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to subsection (b)(4)(A), is greater than 60 mg/L (as $CaCO_3$), calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in subsection (a)(2), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in subsection (a)(2) to use technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L,

respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the director for approval not later than the effective date for compliance in subsection (a)(2). These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a violation of National Primary Drinking Water Regulations.

(iv) The TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(v) The system's source water SUVA, prior to any treatment and measured monthly according to subsection (b)(4)(D), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(vi) The system's finished water SUVA, measured monthly according to subsection (b)(4)(D), is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(C) Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by paragraph (2)(B) may use the alternative compliance criteria in this subparagraph

in lieu of complying with paragraph (2). Systems must still comply with monitoring requirements in subsection (c)(4).

(i) Softening that results in lowering the treated water alkalinity to less than 60 mg/L (as $CaCO_3$), measured monthly according to subsection (b)(4)(A) and calculated quarterly as a running annual average.

(ii) Softening that results in removing at least 10 mg/L of magnesium hardness (as $CaCO_3$), measured monthly according to subparagraph (b)(4)(F) and calculated quarterly as an annual running average.

(2) Enhanced coagulation and enhanced softening performance requirements.

(A) Systems must achieve the per cent reduction of TOC specified in subparagraph (B) between the source water and the combined filter effluent, unless the director approves a system's request for alternate minimum TOC removal (Step 2) requirements under subparagraph (C).

(B) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with subsection (b)(4). Systems practicing softening are required to meet the Step 1 TOC reductions in the far-right column (source water alkalinity greater than 120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC By Enhanced Coagulation and Enhanced Softening for Subpart H Systems Using Conventional Treatment

	Source-water alkalinity, mg/L as $CaCO_3$		
Source-water TOC, mg/L	0-60	>60-120	>120
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

(C) Public water systems with a surface water source or a GWUDI source using conventional treatment systems that cannot achieve the Step 1 TOC removals required by subparagraph (B) due to water quality parameters or operational constraints must apply to the State, within three months of failure to achieve the TOC removals required by subparagraph (B), for approval of alternative minimum TOC (Step 2) removal requirements submitted by the system. If the director approves the alternative minimum TOC removal (Step 2) requirements, the director may make those requirements retroactive for the purposes of determining compliance. Until the director approves the alternate minimum TOC removal (Step 2) requirements, the system must meet the Step 1 TOC removals contained in subparagraph (B).

(D) Alternate minimum TOC removal (Step 2) requirements. Applications made to the director by enhanced coagulation systems for approval of alternative minimum TOC removal (Step 2) requirements under subparagraph (C) must include, as a minimum, results of bench- or pilot-scale testing conducted under clause (i). The submitted bench- or pilot-scale testing must be used to determine the alternate

enhanced coagulation level.

(i) Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in this subparagraph such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of less than or equal to 0.3 mg/L. The per cent removal of TOC at this point on the "TOC removal versus coagulant dose" curve is then defined as the minimum TOC removal required for the system. Once approved by the director, this minimum requirement supersedes the minimum TOC removal required by the table in subparagraph (B). This requirement will be effective until such time as the director approves a new value based on the results of a new bench- and pilot-scale test. Failure to achieve State-set alternative minimum TOC removal levels is a violation of National Primary Drinking Water Regulations.

(ii) Bench- or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH	
Alkalinity (mg/L as CaCO3)	Target pH
0-60	5.5
>60-120	6.3
>120-240	7.0
>240	7.5

(iii) For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (or equivalent addition of iron coagulant) is reached.

(iv) The system may operate at any coagulant dose or pH necessary (consistent with other NPDWRs) to achieve the minimum TOC per cent removal approved under subparagraph (C).

(v) If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the director for a waiver of enhanced coagulation requirements.

(3) Compliance calculations.

(A) Public water systems with a surface water source or a GWUDI source other than those identified in paragraphs (1)(B) and (1)(C) must comply with requirements contained in paragraph (2)(B) or (2)(C), whichever is

applicable. Systems must calculate compliance quarterly, beginning after the system has collected twelve months of data, by determining an annual average using the following method:

(i) Determine actual monthly TOC per cent removal, equal to: (1-(treated water TOC/source water TOC)) x 100

(ii) Determine the required monthly TOC per cent removal (from either the table in paragraph (2)(B) or from paragraph (2)(C)).

(iii) Divide the value in clause (i) by the value in clause (ii).

(iv) Add together the results of clause (iii) for the last twelve months and divide by twelve.

(v) If the value calculated in clause (iv) is less than 1.00, the system is not in compliance with the TOC per cent removal requirements.

(B) Systems may use the provisions in this subparagraph in lieu of the calculations in subparagraph (A) to determine compliance with TOC per cent removal requirements.

(i) In any month that the system's treated or source water TOC level, measured according to subsection (b)(4)(C), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 in lieu of the value calculated in subparagraph (A)(iii) when calculating compliance under the provisions of subparagraph (A).

(ii) In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness (as $CaCO_3$), the system may assign a monthly value of 1.0 in lieu of the value calculated in subparagraph (A)(iii) when

calculating compliance under the provisions of subparagraph (A).

(iii) In any month that the system's source water SUVA, prior to any treatment and measured according to subsection (b)(4)(D), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 in lieu of the value calculated in subparagraph (A)(iii) when calculating compliance under the provisions of subparagraph (A).

(iv) In any month that the system's finished water SUVA, measured according to subsection (b)(4)(D), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 in lieu of the value calculated in subparagraph (A)(iii) when calculating compliance under the provisions of subparagraph (A).

(v) In any month that a system practicing enhanced softening lowers alkalinity below 60 mg/L (as $CaCO_3$), the system may assign a monthly value of 1.0 in lieu of the value calculated in subparagraph (A)(iii) when calculating compliance under the provisions of subparagraph (A).

(C) Public water systems with a surface water source or a GWUDI source using conventional filtration treatment may also comply with the requirements of this subsection by meeting the criteria in paragraphs (1)(B) or (1)(C).

(4) Treatment technique requirements for DBP precursors. The Administrator identifies the following as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems: for public water systems with a surface water source or a GWUDI source using

conventional treatment, enhanced coagulation or enhanced softening. [Eff and comp 11/30/02; am and compiled 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.130, §141.131, §141.132, §141.133, §141.134, §141.135,)

§11-20-45.2 Initial Distribution System Evaluations

(a) General requirements.

(1) The requirements of this section constitute national primary drinking water regulations. The regulations in this section establish monitoring and other requirements for identifying Stage 2 Disinfection Byproduct compliance monitoring locations for determining compliance with maximum contaminant levels for total trihalomethanes (TTHM) and haloacetic acids (five)(HAA5). You must use an Initial Distribution System Evaluation (IDSE) to determine locations with representative high TTHM and HAA5 concentrations throughout your distribution system. IDSEs are used in conjunction with, but separate from, section 11-20-45.1 compliance monitoring, to identify and select Stage 2 Disinfection Byproduct compliance monitoring locations.

(2) Applicability. You are subject to these requirements if your system is a community water system that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light; or if your system is a nontransient noncommunity water system that serves at least 10,000 people and uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

(3) Schedule. You must comply with the requirements of this section on the schedule in the following table.

If you serve this population	You must submit your standard monitoring plan or system specific study plan[1] or 40/30 certification[2] to the State by or receive very small system waiver from the State	You must complete your standard monitoring or system specific study by	You must submit your IDSE report to the State by[3]
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system			
>100,000	October 1, 2006	September 30, 2008	January 1, 2009
50,000-99,999	April 1, 2007	March 31, 2009	July 1, 2009
10,000-49,999	October 1, 2007	September 30, 2009	January 1, 2010
<10,000(CWS only)	April 1, 2008	March 31, 2010	July 1, 2010
Other systems that are part of a combined distribution system			
Wholesale system or consecutive system	-at the same time as the system with the earliest compliance date in the combined distribution system	-at the same time as the system with the earliest compliance date in the combined distribution system	-at the same time as the system with the earliest compliance date in the combined distribution system

[1]If, within 12 months after the date identified in this column, the State does not approve your plan or notify you that it has not yet completed its review, you may consider

the plan that you submitted as approved. You must implement that plan and you must complete standard monitoring or a system specific study no later than the date identified in the third column.

[2]You must submit your 40/30 certification under subsection (d) by the date indicated.

[3]If, within three months after the date identified in this column (nine months after the date identified in this column if you must comply on the schedule with a service population of between 10,000 and 49,999), the State does not approve your IDSE report or notify you that it has not yet completed its review, you may consider the report that you submitted as approved and you must implement the recommended Stage 2 Disinfection Byproduct monitoring as required.

For the purpose of the schedule in this paragraph, the State may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The State may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

(4) You must conduct standard monitoring that meets the requirements in subsection (b), or a system specific study that meets the requirements in subsection (c), or certify to the State that you meet 40/30 certification criteria under subsection (d), or qualify for a very small system waiver under subsection (e).

(A) You must have taken the full complement of routine TTHM and HAA5 compliance samples required of a system with your population and source water under section 11-20-45.1 (or you must have taken the full complement of reduced TTHM and HAA5 compliance samples required of a

system with your population and source water under section 11-20-45.1 if you meet reduced monitoring criteria under section 1-20-45.1) during the period specified in paragraph (d)(1) to meet the 40/30 certification criteria in subsection (d). You must have taken TTHM and HAA5 samples under subsections 11-20-45.1(b) and (c) to be eligible for the very small system waiver in subsection (e).

(B) If you have not taken the required samples, you must conduct standard monitoring that meets the requirements in subsection (b), or a system specific study that meets the requirements in subsection (c).

(5) You must use only the analytical methods specified in subsection 11-20-45.1(b), or otherwise approved by EPA for monitoring under this section, to demonstrate compliance with the requirements of this section.

(6) IDSE results will not be used for the purpose of determining compliance with MCLs in section 11-20-4.1.

(b) Standard monitoring.

(1) Your standard monitoring plan must comply with subparagraphs (A) through (D). You must prepare and submit your standard monitoring plan to the State according to the schedule following paragraph (a)(3).

(A) Your standard monitoring plan must include a schematic of your distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating locations and dates of all projected standard monitoring, and all projected section 11-20-45.1 compliance monitoring.

(B) Your standard monitoring plan must include justification of standard monitoring location selection and a summary of data you relied on to justify standard monitoring location selection.

(C) Your standard monitoring plan must specify the

population served and system type (subpart H or ground water).

(D) You must retain a complete copy of your standard monitoring plan submitted under this paragraph, including any State modification of your standard monitoring plan, for as long as you are required to retain your IDSE report under subparagraph (3)(D).

(2) Standard monitoring requirements.

(A) You must monitor as indicated in the table in this subparagraph. You must collect dual sample sets at each monitoring location. One sample in the dual sample set must be analyzed for TTHM. The other sample in the dual sample set must be analyzed for HAA5. You must conduct one monitoring period during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature. You must review available compliance, study, or operational data to determine the peak historical month for TTHM or HAA5 levels or warmest water temperature.

Source water type	Population size category	Monitoring periods and sampling frequency	Distribution system monitoring locations[1]				
			Total per monitoring period	Near entry points	Average residence time	High TTHM	High HAA5
Subpart H	<500 consecutive systems	One (during peak historical month)[2]	2	1		1	
	<500 non-consecutive systems		2			1	1
	500-3,300 consecutive systems	Four (every 90 days)	2	1		1	
	500-3,300 non-consecutive systems		2			1	1
	3,301-9,999		2		1	2	1
	10,000	Six (every 60	4		2	3	2

Source water type	Population size category	Monitoring periods and sampling frequency	Distribution system monitoring locations[1]				
			Total per monitoring period	Near entry points	Average residence time	High TTHM	High HAA5
	-49,999	days)					
	50,000 -249,999		16	3	4	5	4
	250,000 -999,999		24	4	6	8	6
	1,000,000 -4,999,999		32	6	8	10	8
	>5,000,000		40	8	10	12	10
Ground water	<500 consecutive systems	One (during peak historical month)[2]	2	1		1	
	<500 non -consecutive systems		2			1	1
	500-9,999	Four (every 90 days)	2			1	1
	10,000 -99,999		6	1	1	2	2
	100,000 -499,999		8	1	1	3	3
	>500,000		12	2	2	4	4

[1]A dual sample set (i.e. a TTHM and an HAA5 sample) must be taken at each monitoring location during each monitoring period.

[2]The peak historical month is the month with the highest TTHM or HAA5 levels or the warmest water temperature

(B) You must take samples at locations other than the existing section 11-20-45.1 monitoring locations. Monitoring locations must be distributed throughout the distribution system.

(C) If the number of entry points to the distribution system is fewer than the specified number of entry point monitoring locations, excess entry point samples must be replaced equally at high TTHM and HAA5 locations. If there is an odd extra location number, you must take a sample at a high TTHM location. If the number of entry points to the distribution

system is more than the specified number of entry point monitoring locations, you must take samples at entry points to the distribution system having the highest annual water flows.

(D) Your monitoring under this paragraph may not be reduced under the provisions of section 11-20-16.

(3) IDSE report. Your IDSE report must include the elements required in subparagraphs (A) through (D). You must submit your IDSE report to the State according to the schedule under paragraph (a)(3).

(A) Your IDSE report must include all TTHM and HAA5 analytical results from section 11-20-45.1 compliance monitoring and all standard monitoring conducted during the period of the IDSE as individual analytical results and LRAAs presented in a tabular or spreadsheet format acceptable to the State. If changed from your standard monitoring plan submitted under this subsection, your report must also include a schematic of your distribution system, the population served, and system type (subpart H or ground water).

(B) Your IDSE report must include an explanation of any deviations from your approved standard monitoring plan.

(C) You must recommend and justify Stage 2 Disinfection Byproduct compliance monitoring locations and timing based on the protocol in subsection (f).

(D) You must retain a complete copy of your IDSE report submitted under this section for 10 years after the date that you submitted your report. If the State modifies the Stage 2 Disinfection Byproduct monitoring requirements that you recommended in your IDSE report or if the State approves alternative monitoring locations, you must keep a copy of the State's notification on file for 10 years after the date of the State's notification. You must make the IDSE report and any State notification available for review by the State or the public.

(c) System specific studies and study plan. Your system specific study plan must be based on either existing monitoring results as required under paragraph (1) or modeling as required under paragraph (2). You must prepare and submit your system specific study plan to the State according to the schedule under paragraph (a)(3).

(1) Existing monitoring results. You may comply by submitting monitoring results collected before you are required to begin monitoring under paragraph (a)(3). The monitoring results and analysis must meet the criteria in subparagraphs (A) and (B).

(A) Minimum requirements. TTHM and HAA5 results must be based on samples collected and analyzed in accordance with subsection 11-20-45.1(b). Samples must be collected no earlier than five years prior to the study plan submission date. The monitoring locations and frequency must meet the conditions identified in this subparagraph. Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all section 11-20-45.1 compliance monitoring results plus additional monitoring results as necessary to meet minimum sample requirements.

System type	Population size category	Number of monitoring locations	Number of samples	
			TTHM	HAA5
Subpart H	<500	3	3	3
	500-3,300	3	9	9
	3,301-9,999	6	36	36
	10,000-49,999	12	72	72
	50,000-249,999	24	144	144
	250,000-999,999	36	216	216
	1,000,000-4,999,999	48	288	288
	>5,000,000	60	360	360

System type	Population size category	Number of monitoring locations	Number of samples	
			TTHM	HAA5
Ground	<500	3	3	3
water	500-9,999	3	9	9
	10,000-99,999	12	48	48
	100,000-499,999	18	72	72
	>500,000	24	96	96

(B) Reporting monitoring results. You must report the information in this subparagraph.

(i) You must report previously collected monitoring results and certify that the reported monitoring results include all compliance and non-compliance results generated during the time period beginning with the first reported result and ending with the most recent section 11-20-45.1 results.

(ii) You must certify that the samples were representative of the entire distribution system and that treatment, and distribution system have not changed significantly since the samples were collected.

(iii) Your study monitoring plan must include a schematic of your distribution system (including distribution system entry points and their sources, and storage facilities), with notes indicating the locations and dates of all completed or planned system specific study monitoring.

(iv) Your system specific study plan must specify the population served and system type (subpart H or ground water).

(v) You must retain a complete copy of your system specific study plan submitted under paragraph (c)(1), including any State modification of your system

specific study plan, for as long as you are required to retain your IDSE report under subparagraph (3)(G).

(vi) If you submit previously collected data that fully meet the number of samples required under subparagraph (c)(1)(A) and the State rejects some of the data, you must either conduct additional monitoring to replace rejected data on a schedule the State approves or conduct standard monitoring under subsection (b).

(2) Modeling. You may comply through analysis of an extended period simulation hydraulic model. The extended period simulation hydraulic model and analysis must meet the criteria in this paragraph.

(A) Minimum requirements.

(i) The model must simulate 24 hour variation in demand and show a consistently repeating 24 hour pattern of residence time.

(ii) The model must represent the criteria listed in 40 C.F.R. 141.602(a)(2)(i)(B)(1) through (9).

(iii) The model must be calibrated, or have calibration plans, for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after plan submission.

(B) Reporting modeling. Your system specific study plan must include the information listed in 40 C.F.R. 141.602(a)(2)(ii).

(C) If you submit a model that does not fully meet the requirements under this paragraph, you must correct the deficiencies and respond to State inquiries concerning the model. If you fail to correct deficiencies or respond to inquiries to the State's satisfaction, you must conduct

standard monitoring under subsection (b).

(3) IDSE report. Your IDSE report must include the elements required in subparagraphs (A) through (F). You must submit your IDSE report according to the schedule in paragraph (a)(3).

(A) Your IDSE report must include all TTHM and HAA5 analytical results from section 11-20-45.1 compliance monitoring and all system specific study monitoring conducted during the period of the system specific study presented in a tabular or spreadsheet format acceptable to the State. If changed from your system specific study plan submitted under this subsection, your IDSE report must also include a schematic of your distribution system, the population served, and system type (subpart H or ground water).

(B) If you used the modeling provision under paragraph (2), you must include final information for the elements described in clause (2)(B), and a 24-hour time series graph of residence time for each Stage 2 Disinfection Byproduct compliance monitoring location selected.

(C) You must recommend and justify Stage 2 Disinfection Byproduct compliance monitoring locations and timing based on the protocol in subsection (f).

(D) Your IDSE report must include an explanation of any deviations from your approved system specific study plan.

(E) Your IDSE report must include the basis (analytical and modeling results) and justification you used to select the recommended Stage 2 Disinfection Byproduct monitoring locations.

(F) You may submit your IDSE report in lieu of your system specific study plan on the schedule identified in paragraph (a)(3) for submission of the system specific study plan if you believe that you have the necessary information by the time that the system specific study plan is due. If you elect this approach, your IDSE report

must also include all information required under subsection (c).

(G) You must retain a complete copy of your IDSE report submitted under this section for 10 years after the date that you submitted your IDSE report. If the State modifies the Stage 2 Disinfection Byproduct monitoring requirements that you recommended in your IDSE report or if the State approves alternative monitoring locations, you must keep a copy of the State's notification on file for 10 years after the date of the State's notification. You must make the IDSE report and any State notification available for review by the State or the public.

(d) 40/30 certification

(1) Eligibility. You are eligible for 40/30 certification if you had no TTHM or HAA5 monitoring violations under section 11-20-45.1 of this part and no individual sample exceeded 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 during an eight consecutive calendar quarter period beginning no earlier than the date specified in this paragraph.

If your 40/30 certification is due	Then your eligibility for 40/30 certification is based on eight consecutive calendar quarters of Section 11-20-45.1 compliance monitoring results beginning no earlier than[1]
October 1, 2006	January 2004
April 1, 2007	January 2004
October 1, 2007	January 2005
April 1, 2008	January 2005

[1]Unless you are on reduced monitoring under section 11-20-45.1 and were not required to monitor during the specified period. If you did not monitor during the specified period, you must base your eligibility on compliance samples taken during the 12 months preceeding the specified period.

(2) 40/30 certification requirements.

(A) You must certify to your State that every individual compliance sample taken under section 11-20-45.1 during the periods specified in paragraph (1) were ≤=0.040 mg/L for TTHM and ≤=0.030 mg/L for HAA5, and that you have not had any TTHM or HAA5 monitoring violations during the period specified in paragraph (1).

(B) The State may require you to submit compliance monitoring results, distribution system schematics, and/or recommended Stage 2 Disinfection Byproduct compliance monitoring locations in addition to your certification. If you fail to submit the requested information, the State may require standard monitoring under subsection (b) or a system specific study under subsection (c).

(C) The State may still require standard monitoring under subsection (b) or a system specific study under subsection (c) even if you meet the criteria in paragraph (1).

(D) You must retain a complete copy of your certification submitted under this section for 10 years after the date that you submitted your certification. You must make the certification, all data upon which the certification is based, and any State notification available for review by the State or the public.

(e) Very small system waivers.

(1) If you serve fewer than 500 people and you have taken TTHM and HAA5 samples under section 11-20-45.1, you are not required to comply with this section unless the State notifies you that you must conduct standard monitoring under subsection (b)or a system specific study under subsection (c).

(2) If you have not taken TTHM and HAA5 samples under section 11-20-45.1 or if the State notifies you that you must comply with this section, you must conduct standard monitoring under subsection (b) or a system specific study under subsection (c).

(f) Stage 2 Disinfection Byproducts compliance monitoring location recommendations.

(1) Your IDSE report must include your recommendations and justification for where and during what month(s) TTHM and HAA5 monitoring under section 11-20-45.3 should be conducted. You must base your recommendations on the criteria in paragraphs (2) through (5).

(2) You must select the number of monitoring locations specified in the following table. You will use these recommended locations as Stage 2 Disinfection Byproduct routine compliance monitoring locations, unless State requires different or additional locations. You should distribute locations throughout the distribution system to the extent possible.

Source water type	Population size category	Monitoring frequency[1]	Distribution system monitoring locations[1]			
			Total per monitoring period[2]	Highest TTHM	Highest HAA5	Existing section 11-20-45.1 compliance
Subpart H	<500	per year	2	1	1	-
	500-3,300	per quarter	2	1	1	-
	3,301-9,999	per quarter	2	1	1	-
	10,000 -49,999	per quarter	4	2	2	1
	50,000 -249,999	per quarter	8	3	3	2
	250,000 -999,999	per quarter	12	5	5	3
	1,000,000 -4,999,999	per quarter	16	6	6	4
	>5,000,000	per quarter	20	8	8	5
Ground	<500	per year	2	1	1	-
water	500-9,999	per year	2	1	1	-
	10,000 -99,999	per quarter	4	2	2	1
	100,000 -499,999	per quarter	6	3	3	1
	>500,000	per quarter	8	3	3	2

[1]All systems must monitor during month of highest DBP concentrations.
[2]Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for subpart H systems serving 500-3,300. Ground water systems serving 500-9,999 on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location, and month.

(3) You must recommend Stage 2 Disinfection Byproduct compliance monitoring locations based on standard monitoring results, system specific study results, and section 11-20-45.1 compliance monitoring results. You must follow the protocol in subparagraphs (3)(A) through (3)(H). If required to monitor at more than eight locations, you must repeat the protocol as necessary. If you do not have existing section 11-20-45.1 compliance monitoring results or if you do not have enough existing section 11-20-45.1 compliance monitoring results, you must repeat the protocol, skipping the provisions of subparagraphs (3)(C) and (3)(G) as necessary, until you have identified the required total number of monitoring locations.
   (A) Location with the highest TTHM LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.
   (B) Location with the highest HAA5 LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.
   (C) Existing section 11-20-45.1 average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest HAA5 LRAA not previously selected as a Stage 2

Disinfection Byproduct monitoring location.

(D) Location with the highest TTHM LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.

(E) Location with the highest TTHM LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.

(F) Location with the highest HAA5 LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.

(G) Existing section 11-20-45.1 average residence time compliance monitoring location (maximum residence time compliance monitoring location for ground water systems) with the highest TTHM LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.

(H) Location with the highest HAA5 LRAA not previously selected as a Stage 2 Disinfection Byproduct monitoring location.

(4) You may recommend locations other than those specified in paragraph (3) if you include a rationale for selecting other locations. If the State approves the alternate locations, you must monitor at these locations to determine compliance under section 11-20-45.3.

Your recommended schedule must include Stage 2 Disinfection Byproduct monitoring during the peak historical month for TTHM and HAA5 concentration, unless the State approves another month. Once you have identified the peak historical month, and if you are required to conduct routine monitoring at least quarterly, you must schedule Stage 2 Disinfection Byproduct compliance monitoring at a regular frequency of every 90 days or fewer. [Eff and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.600, §141.601, §141.602, §141.603, §141.604, §141.605)

§11-20-45.3 Stage 2 Disinfection Byproducts Requirements

(a) General Requirements.

(1) The requirements of this section constitute national primary drinking water regulations. The regulations in this section establish monitoring and other requirements for achieving compliance with maximum contaminant levels based on locational running annual averages (LRAA) for total trihalomethanes (TTHM) and haloacetic acids (five)(HAA5), and for achieving compliance with maximum residual disinfectant residuals for chlorine and chloramine for certain consecutive systems.

(2) Applicability. You are subject to these requirements if your system is a community water system or a nontransient noncommunity water system that uses a primary or residual disinfectant other than ultraviolet light or delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light.

(3) Schedule. You must comply with the requirements in this section on the schedule in the following table based on your system type.

If you are this type of system	You must comply with Stage 2 Disinfection Byproduct monitoring by:[1]
Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system	
System serving >100,000	April 1, 2012
System serving 50,000-99,999	October 1, 2012
System serving 10,000-49,999	October 1, 2013
System serving <10,000	October 1, 2013[2] or
	October 1, 2014[3]

If you are this type of system	You must comply with Stage 2 Disinfection Byproduct monitoring by:[1]
Other systems that are part of a combined distribution system	
Consecutive or wholesale system	-at the same time as the system with the earliest compliance date in the combined distribution system

[1]The State may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if you require capital improvements to comply with an MCL.
[2]If no Cryptosporidium monitoring is required under subparagraph 11-20-46.1(b)(1)(D0
[3]If no Cryptosporidium monitoring is required under subparagraphs 11-20-46.1(b)(1)(D) or (F)

(A) Your monitoring frequency is specified in subparagraph (b)(1)(B).
  (i) If you are required to conduct quarterly monitoring, you must begin monitoring in the first full calendar quarter that includes the compliance date in the table in this paragraph.
  (ii) If you are required to conduct monitoring at a frequency that is less than quarterly, you must begin monitoring in the calendar month recommended in the IDSE report prepared under subsection 11-20-45.2(b) or (c) or the calendar month identified in the Stage 2 Disinfection Byproduct monitoring plan developed under subsection (c) no later than 12 months after the compliance date in this table.

(B) If you are required to conduct quarterly monitoring, you must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be

exceeded regardless of the monitoring results of subsequent quarters). If you are required to conduct monitoring at a frequency that is less than quarterly, you must make compliance calculations beginning with the first compliance sample taken after the compliance date.

(C) For the purpose of the schedule in this paragraph, the State may determine that the combined distribution system does not include certain consecutive systems based on factors such as receiving water from a wholesale system only on an emergency basis or receiving only a small percentage and small volume of water from a wholesale system. The State may also determine that the combined distribution system does not include certain wholesale systems based on factors such as delivering water to a consecutive system only on an emergency basis or delivering only a small percentage and small volume of water to a consecutive system.

(4) Monitoring and compliance

(A) Systems required to monitor quarterly. To comply with this section MCLs in paragraph 11-20-4.1(b)(2), you must calculate LRAAs for TTHM and HAA5 using monitoring results collected under this subpart and determine that each LRAA does not exceed the MCL. If you fail to complete four consecutive quarters of monitoring, you must calculate compliance with the MCL based on the average of the available data from the most recent four quarters. If you take more than one sample per quarter at a monitoring location, you must average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

(B) Systems required to monitor yearly or less frequently. To determine compliance with this section MCLs in paragraph 11-20-4.1(b)(2), you must determine that each sample taken is less than the MCL. If any sample exceeds the MCL, you

must comply with the requirements of subsection (f). If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

(5) Violation. You are in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if you fail to monitor.

(b) Routine Monitoring.

(1) Monitoring.

(A) If you submitted an IDSE report, you must begin monitoring at the locations and months you have recommended in your IDSE report submitted under subsection 11-20-45.2(f) following the schedule in paragraph (a)(3), unless the State requires other locations or additional locations after its review. If you submitted a 40/30 certification under subsection 11-20-45.2(d) or you qualified for a very small system waiver under subsection 11-20-45.2(e) or you are a nontransient noncommunity water system serving <10,000, you must monitor at the location(s) and dates identified in your monitoring plan in paragraph 11-20-45.1(c)(6), updated as required by subsection (c).

(B) You must monitor at no fewer than the number of locations identified in this paragraph.

Source water type	Population size category	Monitoring frequency[1]	Distribution system monitoring location total per monitoring period
Subpart H	<500	per year	2
	500-3,300	per quarter	2
	3,301-9,999	per quarter	2
	10,000-49,999	per quarter	4
	50,000-249,999	per quarter	8
	250,000-999,999	per quarter	12

Source water type	Population size category	Monitoring frequency[1]	Distribution system monitoring location total per monitoring period
	1,000,000-4,999,999	per quarter	16
	>5,000,000	per quarter	20
Ground	<500	per year	2
water	500-9,999	per year	2
	10,000-99,999	per quarter	4
	100,000-499,999	per quarter	6
	>500,000	per quarter	8

[1]All systems must monitor during month of highest DBP concentrations.

[2]Systems on quarterly monitoring must take dual sample sets every 90 days at each monitoring location, except for subpart H systems serving 500-3,300. Ground water systems serving 500-9,999 on annual monitoring must take dual sample sets at each monitoring location. All other systems on annual monitoring and subpart H systems serving 500-3,300 are required to take individual TTHM and HAA5 samples (instead of a dual sample set) at the locations with the highest TTHM and HAA5 concentrations, respectively. For systems serving fewer than 500 people, only one location with a dual sample set per monitoring period is needed if highest TTHM and HAA5 concentrations occur at the same location, and month, if monitored annually).

(C) If you are an undisinfected system that begins using a disinfectant other than UV light after the dates in section 11-20-45.2 for complying with the Initial Distribution System Evaluation requirements, you must consult with the State to identify compliance monitoring locations for this subpart. You must then develop a monitoring plan under subsection (c) that includes those monitoring locations.

(2) Analytical methods. You must use an approved method

listed in subsection 11-20-45.1(b) for TTHM and HAA5 analyses in this section. Analyses must be conducted by laboratories that have received certification by EPA or the State as specified in subsection 11-20-45.1(b).

(c) Monitoring plan.

(1) You must develop and implement a monitoring plan to be kept on file for State and public review. The monitoring plan must contain the elements in this paragraph and be complete no later than the date you conduct your initial monitoring under this section.

(A) Monitoring locations;

(B) Monitoring dates;

(C) Compliance calculation procedures; and

(D) Monitoring plans for any other systems in the combined distribution system.

(2) If you were not required to submit an IDSE report under either subsection 11-20-45.2(b) or (c), and you do not have sufficient section 11-20-45.1 monitoring locations to identify the required number of this section compliance monitoring locations indicated in paragraph 11-20-45.2(f)(2), you must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. You must also provide the rationale for identifying the locations as having high levels of TTHM or HAA5. If you have more section 11-20-45.1 monitoring locations than required for this section compliance monitoring in paragraph 11-20-45.2(f)(2), you must identify which locations you will use for this section compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of this section compliance monitoring locations have been identified.

(3) If you are a subpart H system serving > 3,300 people, you must submit a copy of your monitoring plan to the State prior to the date you conduct your initial monitoring, unless your IDSE report submitted under section 11-20-45.2 contains all the information

required by this section.

(4) You may revise your monitoring plan to reflect changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for State-approved reasons, after consultation with the State regarding the need for changes and the appropriateness of changes. If you change monitoring locations, you must replace existing compliance monitoring locations with the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels. The State may also require modifications in your monitoring plan. If you are a subpart H system serving > 3,300 people, you must submit a copy of your modified monitoring plan to the State prior to the date you are required to comply with the revised monitoring plan.

(d) Reduced monitoring.

(1) You may reduce monitoring to the level specified in the table in 40 C.F.R. §141.623(a) any time the LRAA is ≤=0.040 mg/L for TTHM and ≤=0.030 mg/L for HAA5 at all monitoring locations. You may only use data collected under the provisions of this section or section 11-20-45.1 to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, must be ≤=4.0 mg/L at each treatment plant treating surface water or ground water under the direct influence of surface water, based on monitoring conducted under either clause 11-20-45.1(c)92)(A)(iii) or paragraph 11-20-45.1(c)(4).

(2) You may remain on reduced monitoring as long as the TTHM LRAA ≤=0.040 mg/L and the HAA5 LRAA ≤=0.030 mg/L at each monitoring location (for systems with quarterly reduced monitoring) or each TTHM sample ≤=0.060 mg/L and each HAA5 sample ≤=0.045 mg/L (for systems with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, must be ≤=4.0 mg/L at each treatment plant treating surface water or ground

water under the direct influence of surface water, based on monitoring conducted under either clause 11-20-45.1(c)92)(A)(iii) or paragraph 11-20-45.1(c)(4).

(3) If the LRAA based on quarterly monitoring at any monitoring location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5 or if the annual (or less frequent) sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5, or if the source water annual average TOC level, before any treatment, >4.0 mg/L at any treatment plant treating surface water or ground water under the direct influence of surface water, you must resume routine monitoring under subsection (b) or begin increased monitoring if subsection (f) applies.

(4) The State may return your system to routine monitoring at the State's discretion.

(e) Additional requirements for consecutive systems. If you are a consecutive system that does not add a disinfectant but delivers water that has been treated with a primary or residual disinfectant other than ultraviolet light, you must comply with analytical and monitoring requirements for chlorine and chloramines in paragraph 11-20-45.1(b)93) and subparagraph 11-20-45.1(c)(3)(A) and the compliance requirements in subparagraph 11-20-45.1(d)(3)(A) beginning April 1, 2009, unless required earlier by the State, and report monitoring results under paragraph 11-20-45.1(e)(3).

(f) Conditions requiring increased monitoring.

(1) If you are required to monitor at a particular location annually or less frequently than annually under subsection (b)(or (d), you must increase monitoring to dual sample sets once per quarter (taken every 90 days) at all locations if a TTHM sample is >0.080 mg/L or a HAA5 sample is >0.060 mg/L at any location.

(2) You are in violation of the MCL when the LRAA exceeds the this section MCLs in paragraph 11-20-4.1(b)(2), calculated based on four consecutive quarters of monitoring (or the LRAA calculated based on fewer than four quarters of data if the MCL would be exceeded regardless of the monitoring results of

subsequent quarters). You are in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA if you fail to monitor.

(3) You may return to routine monitoring once you have conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is ≤=0.060 mg/L for TTHM and ≤=0.045 mg/L for HAA5.

(g) Operational evaluation levels.

(1) You have exceeded the operational evaluation level at any monitoring location where the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine an average, exceeds 0.080 mg/L, or where the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average, exceeds 0.060 mg/L.

(2) If you exceed the operational evaluation level, you must conduct an operational evaluation and submit a written report of the evaluation to the State no later than 90 days after being notified of the analytical result that causes you to exceed the operational evaluation level. The written report must be made available to the public upon request.

(A) Your operational evaluation must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

(B) You may request and the State may allow you to limit the scope of your evaluation if you are able to identify the cause of the operational evaluation level exceedance. Your request to limit the scope of the evaluation does not extend the schedule in paragraph (2) for submitting the written report. The State must

approve this limited scope of evaluation in writing and you must keep that approval with the completed report.

(h) Requirements for remaining on reduced TTHM and HAA5 monitoring based on section 11-20-45.1 results. You may remain on reduced monitoring after the dates identified in paragraph (a)(3) for compliance with this section only if you qualify for a 40/30 certification under subsection 11-20-45.2(d) or have received a very small system waiver under subsection 11-20-45.2(e), plus you meet the reduced monitoring criteria in paragraph (d)(1), and you do not change or add monitoring locations from those used for compliance monitoring under section 11-20-45.1. If your monitoring locations under this section differ from your monitoring locations under section 11-20-45.1, you may not remain on reduced monitoring after the dates identified in paragraph (a)(3) for compliance with this section.

(i) Requirements for remaining on increased TTHM and HAA5 monitoring based on section 11-20-45.1 results. If you were on increased monitoring under subparagraph 11-20-45.1(c)(2)(A), you must remain on increased monitoring until you qualify for a return to routine monitoring under subsection (f)(3). You must conduct increased monitoring under subsection (f) at the monitoring locations in the monitoring plan developed under subsection (c) beginning at the date identified in paragraph (a)(3) for compliance with this section and remain on increased monitoring until you qualify for a return to routine monitoring under paragraph (f)(3).

(j) Reporting and recordkeeping requirements.

(1) Reporting.

(A) You must report the following information for each monitoring location to the State within 10 days of the end of any quarter in which monitoring is required:

(i) Number of samples taken during the last quarter.

(ii) Date and results of each sample taken during the last quarter.

(iii) Arithmetic average of quarterly results for the last four quarters for each monitoring location (LRAA), beginning

at the end of the fourth calendar quarter that follows the compliance date and at the end of each subsequent quarter. If the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, you must report this information to the State as part of the first report due following the compliance date or anytime thereafter that this determination is made. If you are required to conduct monitoring at a frequency that is less than quarterly, you must make compliance calculations beginning with the first compliance sample taken after the compliance date, unless you are required to conduct increased monitoring under subsection (f).

(iv) Whether, based on paragraph 11-20-4.1(b)(2) and this section, the MCL was violated at any monitoring location.

(v) Any operational evaluation levels that were exceeded during the quarter and, if so, the location and date, and the calculated TTHM and HAA5 levels.

(B) If you are a subpart H system seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, you must report the following source water TOC information for each treatment plant that treats surface water or ground water under the direct influence of surface water to the State within 10 days of the end of any quarter in which monitoring is required:

(i) The number of source water TOC samples taken each month during last quarter.

(ii) The date and result of each sample taken during last quarter.

(iii) The quarterly average of monthly samples taken during last quarter or the result of

the quarterly sample.

(iv) The running annual average (RAA) of quarterly averages from the past four quarters.

(v) Whether the RAA exceeded 4.0 mg/L.

(C) The State may choose to perform calculations and determine whether the MCL was exceeded or the system is eligible for reduced monitoring in lieu of having the system report that information.

(2) Recordkeeping. You must retain any this section monitoring plans and your this section monitoring results as required by section 11-20-19. [Eff and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.620 through §141.629)

§11-20-46 Filtration and disinfection (Surface Water Treatment Rule). (a) General requirements. This section, also known as the Surface Water Treatment Rule (SWTR), establishes criteria under which filtration is required as treatment for public water systems supplied by either a surface water source or by a ground water source under the direct influence of surface water (GWUDI). In addition, these rules establish treatment requirements in lieu of MCLs for the following contaminants: Giardia lamblia, viruses, heterotrophic plate count (HPC) bacteria, Legionella, and turbidity.

(1) Each public water system with a surface water source or a GWUDI source shall provide treatment of that source water by installing and properly operating water treatment processes which reliably achieve at least:

(A) A total of 99.9 per cent (3-log) removal and 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

(B) A total of 99.99 per cent (4-log) removal and 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.

(2) A public water system using a surface water source or a GWUDI source shall meet the requirements of this section if it meets the disinfection requirements in subsection (b) and the filtration requirements in subsection (c).

(3) Each public water system using a surface water source or a GWUDI source shall be operated by qualified personnel who meet the requirements specified by the director to minimize risk to human health or welfare.

(4) Water purveyors with a surface water or GWUDI source shall implement the requirements of the "Surface Water Treatment Rule Administrative Manual" dated January 1, 2002. Copies of the administrative manual are available upon request from the safe drinking water branch office in Honolulu, or the district health offices on Kauai, Maui, and Hawaii.

(5) In addition to complying with the requirements in this section, systems must also comply with the requirements in section 11-20-46.1.

(b) Disinfection. A public water system that uses a surface water source or a GWUDI source shall comply, before filtration is installed, with any interim disinfection requirements the director deems necessary to protect human health and welfare. A system that uses a surface water source or a GWUDI source shall provide the disinfection treatment specified in this subsection beginning June 29, 1993, or beginning when filtration is installed, whichever is later. Each public water system that provides filtration treatment shall provide disinfection treatment as follows:

(1) The disinfection treatment shall be sufficient to ensure that the total treatment processes of that system achieve at least a total of 99.9 per cent (3-log) inactivation and removal of

Giardia lamblia cysts and at least a total of 99.99 per cent (4-log) inactivation and removal of viruses, as determined by the director. Each public water system shall prove that it is meeting the previous disinfection criteria by determining CTs and total inactivation ratios of 1.0 or greater and reporting these data to the director on a monthly basis;

(2) The residual disinfectant concentration in the water entering the distribution system, measured as specified in subsections (d)(1)(B) and (d)(2)(B)(ii), cannot be less than 0.2 mg/l for more than four hours; and

(3) The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in subsection (d)(1)(B), cannot be undetectable in more than five per cent of the samples each month, for any two consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration greater than 500/ml, measured as HPC as specified in subsection (d)(1)(A), is deemed to have an undetectable disinfectant residual for purposes of determining compliance with this requirement. Thus, the value "v" in the formula given in subsection (e)(2)(B)(iv) cannot exceed five per cent in one month, for any two consecutive months.

(c) Filtration. A public water system that uses a surface water source or a GWUDI source shall provide treatment consisting of both disinfection, as specified in subsection (b), and filtration treatment which complies with the requirements of paragraphs (1) and (2) by June 29, 1993.

(1) Except where specified in section 11-20-46.1(c), the turbidity level of representative samples of a system's filtered water shall at no time exceed 5 NTU, measured as specified in subsections (d)(1)(A) and

(d)(2)(B)(i).

(2) The turbidity level of representative samples of a systems filtered water shall be less than or equal to the following values in at least ninety-five per cent of the measurements taken each month as specified in subsections (d)(1)(A) and (d)(2)(B)(i).

(A) Conventional filtration treatment or direct filtration. 0.5 NTU, measured as specified in subsections (d)(1)(A) and (d)(2)(B)(i).

(i) Beginning January 1, 2002, systems serving at least 10,000 people must meet the turbidity requirements in section 11-20-46.1(c)(1).

(ii) Beginning January 1, 2005, systems serving fewer than 10,000 people must meet the turbidity requirements in section 11-20-46.1(c)(1).

(B) Slow sand filtration. 1 NTU.

(C) Diatomaceous earth filtration. 1 NTU.

(D) Other filtration technologies. A public water system may use a filtration technology not listed in subparagraphs (A) to (C) if the supplier demonstrates to the director, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment meeting the requirements of subsection (b), consistently achieves at least a total of 99.9 per cent removal and inactivation of Giardia lamblia cysts and at least a total of 99.99 per cent removal and inactivation of viruses. For a system that makes this demonstration, the requirements for subparagraph A apply. Beginning January 1, 2002, systems serving at least 10,000 people must meet the requirements for other filtration technologies in section 11-20-46.1(c)(2). Beginning January 1,

2005, systems serving fewer than 10,000 people must meet the requirements for other filtration technologies in section 11-20-46.1(c)(2).

(d) Analytical and monitoring requirements.

(1) Analytical requirements. Only the analytical method(s) specified in this paragraph, or otherwise approved by EPA, may be used to demonstrate compliance with the requirements of subsections (b) and (c). Measurements for pH, temperature, turbidity, and residual disinfectant concentrations shall be conducted by a party approved by the director. Measurements for total coliforms, fecal coliforms or E. coli, and HPC shall be conducted by a laboratory certified by the director or EPA to do such analysis. Until laboratory certification criteria are developed for the analysis of HPC and fecal coliforms or E. coli, any laboratory certified for total coliform analysis by EPA is deemed certified for HPC and fecal coliform or E. coli analysis. The following procedures shall be performed in accordance with the publications listed in the following subparagraphs.

(A) Public water systems must conduct analysis of pH and temperature in accordance with one of the methods listed in 40 C.F.R. §141.23(k)(1). Public water systems must conduct analyses of total coliforms, fecal coliforms or E. coli, heterotrophic bacteria, and turbidity in accordance with the analytical methods in 40 C.F.R. §141.74(a)(1) or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C, and by using analytical test procedures contained in *Technical Notes on Drinking Water Methods*, EPA-600/R-94-173, October 1994. This document is available from the National Service Center for Environmental Publications (NSCEP), P.O. Box 42419,

Cincinnati, Ohio 45242-0419 or *http://www.epa.gov/nscep/*.

(B) Public water systems must measure residual disinfectant concentrations with one of the analytical methods in 40 C.F.R. §141.74(a)(2) or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C. If approved by the director, residual disinfectant concentrations for free chlorine and combined chlorine also may be measured by using DPD colorimetric test kits. Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days, or with a protocol approved by the director.

(2) Monitoring requirements.

(A) A public water system that uses a surface water source or a GWUDI source shall comply with any interim reporting requirements, as specified by the director to minimize risk to human health or welfare, until filtration is in place.

(B) A public water system that uses a surface water source or a GWUDI source and provides filtration treatment shall monitor in accordance with this paragraph beginning June 29, 1993, or when filtration is installed, whichever is later.

(i) Turbidity measurements as required by subsection (c) shall be performed on representative samples of the system's filtered water at least every four hours that the system serves water to the public. A

supplier may substitute continuous turbidity monitoring for grab sample monitoring if the supplier validates the continuous measurement for accuracy on a regular basis using a protocol approved by the director.

(ii) The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value shall be recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment. If at any time the residual disinfectant concentration falls below 0.2 mg/l in a system using grab sampling in lieu of continuous monitoring, the supplier shall take a grab sample every four hours until the residual disinfectant concentration is equal to or greater than 0.2 mg/l.

(iii) Heterotrophic bacteria, measured as HPC as specified in paragraph (1)(A), shall 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 11-20-6, except that the director may allow a public water system which uses both a surface water source or a GWUDI source, and a ground water source to take HPC samples at points other than the total coliform sampling points if the director determines that such points are more representative of treated (disinfected) water quality within

the distribution system. Residual disinfectant concentration should also be measured for operational control.

(e) Reporting and recordkeeping requirements.

(1) A public water system that uses a surface water source or a GWUDI source shall comply with any interim reporting requirements, as specified by the director to minimize risk to human health and welfare, until filtration is in place.

(2) When a public water system that uses a surface water source or a GWUDI source and provides filtration treatment, the supplier shall report monthly to the director the information specified in this paragraph beginning June 29, 1993, or when filtration is installed, whichever is later.

(A) Turbidity measurements as required by subsection (d)(2)(B)(i) shall be reported within ten days after the end of each month the system serves water to the public. Information that shall be reported includes:

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

(ii) 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 subsection (c) for the filtration technology being used.

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

(B) Disinfection information specified in subsection (d)(2) shall be reported to the director within ten days after the end of each month the system serves water to the public. Information that shall be reported includes:

(i) For each day, the lowest measured

residual disinfectant concentration in mg/l in water entering the distribution system.

(ii) The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.2 mg/l and when the director was notified of the occurrence.

(iii) The following information on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to subsection (b): the number of routine total coliform samples collected and the number of instances in which HPC is more than 500 per milliliter.

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

$$V = \frac{b \times 100}{a}$$

where

a = the number of routine total coliform samples collected,

b = the number of instances in which HPC is more than 500 per milliliter.

(C) (i) Each supplier, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, shall report that occurrence to the director as soon as possible, but no later than 24 hours after the waterborne disease outbreak is known, in compliance with section

11-20-18(b).

(ii) If at any time the turbidity exceeds 5 NTU, the system must consult with the State as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under section 11-20-18(c)(2)(C).

(iii) If at any time the disinfectant residual falls below 0.2 mg/l in the water entering the distribution system, the supplier shall notify the director within 24 hours of the time that the inadequate disinfection level is known. The supplier also shall notify the director within 24 hours whether or not the residual was restored to at least 0.2 mg/l within four hours.

(f) Recycle provisions.

(1) Applicability. All public water systems supplied by a surface water source or a GWUDI source that employ conventional filtration or direct filtration treatment and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the requirements in paragraphs (2) through (4).

(2) Reporting. A system must notify the director in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. New plants shall be given 15 months from the startup date approved by the director to report the information required under this subsection. This notification must include, at a minimum, the information specified in subparagraphs (A) and (B).

(A) A plant schematic showing the origin of all flows which are recycled (including, but not limited to, spent filter backwash

water, thickener supernatant, and liquids from dewatering processes), the hydraulic conveyance used to transport them, and the location where they are reintroduced back into the treatment plant.

(B) Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year (gpm), design flow for the treatment plant (gpm), and State-approved operating capacity for the plant where the director has made such determinations.

(3) Treatment technique requirement. Any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must return these flows through the processes of a system's existing conventional or direct filtration system as defined in section 11-20-2 or at an alternate location approved by the director by June 8, 2004. If capital improvements are required to modify the recycle location to meet this requirement, all capital improvements must be completed no later than June 8, 2006. New plants shall return these recycle flows through the processes of a system's conventional or direct filtration system or at an alternate location approved by the director.

(4) Recordkeeping. The system must collect and retain on file recycle flow information specified in subparagraphs (A) through (F) for review and evaluation by the director beginning June 8, 2004.

(A) Copy of the recycle notification and information submitted to the director under paragraph (2).

(B) List of all recycle flows and the frequency with which they are returned.

(C) Average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

(D) Typical filter run length and a written summary of how filter run length is determined.

(E) The type of treatment provided for the recycle flow.

(F) Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable. [Eff and comp 1/2/93; am and comp 12/15/94; am and comp 10/13/97; comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, and 300j-9; 40 C.F.R. §§141.70, §141.72, §141.73, §141.74, and §141.75)

§11-20-46.1 Enhanced filtration and disinfection. (a) General requirements. The requirements of this section constitute national primary drinking water regulations. This section establishes requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required under section 11-20-46(a). The requirements of this section are applicable to public water systems with a surface water source or a GWUDI source serving at least 10,000 people, beginning January 1, 2002 and serving fewer than 10,000 people, beginning January 1, 2005, unless otherwise specified in this section. The regulations in this section establish or extend treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: Giardia lamblia, viruses, heterotrophic plate count bacteria, Legionella, Cryptosporidium, and turbidity.

(1) Each public water system with a surface water

source or a GWUDI source shall provide treatment of that source water that complies with these treatment technique requirements and are in addition to those identified in section 11-20-46. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(A) At least 99 per cent (2-log) removal of Cryptosporidium between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

(B) Compliance with the profiling and benchmark requirements under the provisions of subsection (b).

(2) A public water system subject to the requirements of this section is considered to be in compliance with the requirements of this subsection if it meets the applicable filtration requirements in either section 11-20-46(c) or subsection (c) and the disinfection requirements in section 11-20-46(b) and subsection (b).

(3) Systems are not permitted to begin construction of uncovered finished water storage facilities beginning February 16, 1999.

(4) Public water systems with a surface water source or a GWUDI source that did not conduct optional monitoring under subsection (b) because they served fewer than 10,000 persons when such monitoring was required, but serve more than 10,000 persons prior to January 1, 2005 must comply with this subsection.

(b) Disinfection profiling and benchmarking.

(1) Determination of systems required to profile. A public water system with a surface water source or GWUDI source serving at least 10,000 people subject to the requirements of this paragraph must determine its TTHM annual average using the procedure in subparagraph (A)

and its HAA5 annual average using the procedure in subparagraph (B). The annual average is the arithmetic average of the quarterly averages of four consecutive quarters of monitoring. For a public water system with a surface water source or GWUDI source serving fewer than 10,000 people, the director may determine that a system's profile is unnecessary if a system's reported TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively. To determine these levels, TTHM and HAA5 samples must be collected after January 1, 1998, during the month with the warmest water temperature, and at the point of maximum residence time in your distribution system. Any affected system having either a TTHM level $\geq$0.064mg/L or an HAA5 level $\geq$0.048 mg/L must comply with paragraph (2).

(A) The TTHM annual average must be the annual average during the same period as is used for the HAA5 annual average.

(i) Those systems that collected data under the provisions of 40 C.F.R. 141 subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under Sec. 141.142 of that subpart.

(ii) Those systems that use "grandfathered" HAA5 occurrence data that meet the provisions of subparagraph (B)(ii) must use TTHM data collected at the same time under the provisions of sections 11-20-4 and 11-20-45.

(iii) Those systems that use HAA5 occurrence data that meet the provisions of subparagraph (B)(iii) must use TTHM data collected at the same time under the provisions of sections 11-20-4 and 11-20-45.

(B) The HAA5 annual average must be the annual average during the same period as is used

for the TTHM annual average.

(i) Those systems that collected data under the provisions of 40 C.F.R. subpart M (Information Collection Rule) must use the results of the samples collected during the last four quarters of required monitoring under 40 C.F.R. Sec. 141.142.

(ii) Those systems that have collected four quarters of HAA5 occurrence data that meets the routine monitoring sample number and location requirements for TTHM in sections 11-20-4 and 11-20-45 and handling and analytical method requirements of 40 C.F.R. Sec. 141.142(b)(1) may use those data to determine whether the requirements of this section apply.

(iii) Those systems that have not met the provisions of either clause (i) or (ii) by March 16, 1999 must either: conduct monitoring for HAA5 that meets the routine monitoring sample number and location requirements for TTHM in sections 11-20-4 and 11-20-45 and the handling and analytical method requirements of 40 C.F.R. Sec. 141.142(b)(1) to determine the HAA5 annual average and whether the requirements of paragraph (2) apply (this monitoring must be completed so that the applicability determination can be made no later than March 31, 2000), or comply with all other provisions of this subsection as if the HAA5 monitoring had been conducted and the results required compliance with paragraph (2).

(C) The system may request that the director approve a more representative annual data set than the data set determined under subparagraph (A) or (B) for a public water

system with a surface water source or GWUDI source serving at least 10,000 people, or paragraph (b)(1) for a public water system with a surface water source or GWUDI source serving fewer than 10,000 people for the purpose of determining applicability of the requirements of this subsection.

(D) The director may require that a system use a more representative annual data set than the data set determined under subparagraph (A) or (B) for the purpose of determining applicability of the requirements of this subsection.

(E) The system must submit data to the director on the schedule in clauses (i) through (v).

(i) Those systems that collected TTHM and HAA5 data under the provisions of 40 C.F.R. subpart M (Information Collection Rule), as required by subparagraphs (A)(i) and (B)(i), must submit the results of the samples collected during the last twelve months of required monitoring under 40 C.F.R. Sec. 141.142 not later than December 31, 1999.

(ii) Those systems that have collected four consecutive quarters of HAA5 occurrence data that meets the routine monitoring sample number and location for TTHM in sections 11-20-4 and 11-20-45 and handling and analytical method requirements of 40 C.F.R. Sec. 141.142(b)(1), as allowed by subparagraphs (A)(ii) and (B)(ii), must submit those data to the director not later than April 16, 1999. Until the director has approved the data, the system must conduct monitoring for HAA5 using the monitoring requirements specified under subparagraph (B)(iii).

(iii) Those systems that conduct

monitoring for HAA5 using the monitoring requirements specified by subparagraphs (A)(iii) and (B)(iii), must submit TTHM and HAA5 data not later than March 31, 2000.

(iv) Those systems that elect to comply with all other provisions of this subsection as if the HAA5 monitoring had been conducted and the results required compliance with this subsection, as allowed under subparagraph (B)(iii), must notify the director in writing of their election not later than December 31, 1999.

(v) If the system elects to request that the director approve a more representative annual data set than the data set determined under subparagraph (B)(i), the system must submit this request in writing not later than December 31, 1999.

(F) Any system having either a TTHM annual average $\geq$0.064mg/L or an HAA5 annual average $\geq$0.048 mg/L during the period identified in subparagraphs (A) and (B) must comply with paragraph (2).

(2) Disinfection profiling.

(A) Any system that meets the criteria in paragraph (1)(F) must develop a disinfection profile of its disinfection practice for a period of up to three years.

(B) The system must monitor daily for a period of twelve consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the CT99.9 values in Tables E-1 thru E-6, E-8, E-10, and E-12 of the Hawaii Surface Water Treatment Rule Administrative Manual, as appropriate, through the entire treatment plant. Public water systems with a surface water source or GWUDI source

serving at least 10,000 people, must begin this monitoring not later than April 1, 2000. For a public water system with a surface water source or GWUDI source serving fewer than 10,000 people, monitoring must begin no later than July 1, 2003. New or substantially modified systems, as defined under sections 11-20-29 and 11-20-30 respectively, applying after April 1, 2000 shall begin monitoring not later than a date determined by the director. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring specified in this subparagraph. A system with more than one point of disinfectant application must conduct the monitoring in this subparagraph for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in section 11-20-46(d)(1), as follows:

(i) The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

(ii) If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

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

(iv) The residual disinfectant concentration(s) ("C") of the water before or at the first customer and

prior to each additional point of disinfection must be measured each day during peak hourly flow.

(C) In lieu of the monitoring conducted under the provisions of subparagraph (B) to develop the disinfection profile, the system may elect to meet the requirements of clause (C)(i). In addition to the monitoring conducted under the provisions of subparagraph (B) to develop the disinfection profile, the system may elect to meet the requirements of clause (C)(ii).

(i) A PWS that has three years of existing operational data may submit those data, a profile generated using those data, and a request that the director approve use of those data in lieu of monitoring under the provisions of subparagraph (B) not later than March 31, 2000 for a public water system with a surface water source or GWUDI source serving at least 10,000 people, and July 1, 2003 for a public water system with a surface water source or GWUDI source serving fewer than 10,000 people. The director must determine whether these operational data are substantially equivalent to data collected under the provisions of subparagraph (B). These data must also be representative of Giardia lamblia inactivation through the entire treatment plant and not just of certain treatment segments. Until the director approves this request, the system is required to conduct monitoring under the provisions of subparagraph (B).

(ii) In addition to the disinfection profile generated under subparagraph (B), a PWS that has existing

operational data may use those data to develop a disinfection profile for additional years. Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of paragraph (3). The director must determine whether these operational data are substantially equivalent to data collected under the provisions of subparagraph (B). These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

(D) The system must calculate the total inactivation ratio as follows:

(i) If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either: determining one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow, or determining successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine $\sum(CTcalc/CT_{99.9})$.

(ii) If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each

disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The $(CTcalc/CT_{99.9})$ value of each segment and $\sum(CTcalc/CT_{99.9})$ must be calculated using the method in clause (i).

(iii) The system must determine the total logs of inactivation by multiplying the value calculated in clause (i) or (ii) by 3.0.

(E) A system that uses either chlorine dioxide, chloramines, or ozone for primary disinfection must also calculate the logs of inactivation for viruses and develop an additional disinfection profile for viruses using a method approved by the State.

(F) The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the director for review as part of sanitary surveys conducted by the State.

(3) Disinfection benchmarking.

(A) Any system required to develop a disinfection profile under the provisions of paragraphs (1) and (2) and that decides to make a significant change to its disinfection practice must consult with the director prior to making such change. Significant changes to disinfection practice are:

(i) Changes to the point of disinfection;

(ii) Changes to the disinfectant(s) used in the treatment plant;

(iii) Changes to the disinfection process; and

(iv) Any other modification identified by the State.

(B) Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified in this subparagraph.

(i) For each year of profiling data collected and calculated under paragraph (2), the system must determine the lowest average monthly Giardia lamblia inactivation in each year of profiling data. The system must determine the average Giardia lamblia inactivation for each calendar month for each year of profiling data by dividing the sum of daily Giardia lamblia of inactivation by the number of values calculated for that month.

(ii) The disinfection benchmark is the lowest monthly average value(for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of Giardia lamblia inactivation in each year of profiling data.

(C) A system that uses either chlorine dioxide, chloramines, or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the State.

(D) As part of its consultation process with the director, the system must submit the following information:

(i) A description of the proposed change, including why the change is being proposed, a summary of alternatives considered with positive and negative impacts, and a final analysis of the selected alternative;

(ii) The disinfection profile for Giardia

lamblia (and, if necessary, viruses) under paragraph (2) and benchmark as required by paragraph (3)(B);

(iii) An analysis of how the proposed change will affect the current levels of disinfection; and

(iv) Any additional information requested by the director.

(c) Filtration. A public water system is subject to the requirements of this subsection consisting of both disinfection, as specified in section 11-20-46(b), and filtration treatment which complies with the requirements of this subsection or section 11-20-46.

(1) Conventional filtration treatment or direct filtration.

(A) 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 0.3 NTU in at least 95 per cent of the measurements taken each month, measured as specified in section 11-20-46(d)(1) and (2).

(B) The turbidity level of representative samples of a system's filtered water must at no time exceed 1 NTU, measured as specified in section 11-20-46(d)(1) and (2).

(C) A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the State.

(2) Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. A public water system may use a filtration technology not listed in either paragraph (1) or in section 11-20-46(c)(2)(B) or (C) if it demonstrates to the State, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection

treatment that meets the requirements of section 11-20-46(b), consistently achieves 99.9 per cent removal and/or inactivation of Giardia lamblia cysts and 99.99 per cent removal and/or inactivation of viruses, and 99 per cent removal of Cryptosporidium oocysts, and the director approves the use of the filtration technology. For a system that makes this demonstration, the requirements for conventional filtration apply.

(d) Filtration sampling requirements.

(1) Monitoring requirements for systems using filtration treatment. In addition to monitoring required by section 11-20-46(d), a public water system subject to the requirements of this section that provides filtration treatment, other than slow sand filtration or diatomaceous earth filtration, must conduct continuous monitoring of turbidity for each individual filter using an approved method in section 11-20-46(d)(1) and must calibrate turbidimeters using the procedure specified by the manufacturer. Systems must record the results of individual filter monitoring every fifteen minutes.

(2) If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring, but for no more than five working days for a public water system with a surface water source or GWUDI source serving at least 10,000 people, and fourteen calendar days for a public water system with a surface water source or GWUDI source serving fewer than 10,000 people following the failure of the equipment.

(e) Reporting and recordkeeping requirements. In addition to the reporting and recordkeeping requirements in section 11-20-46(e), a public water system subject to the requirements of this section that provides conventional filtration treatment or direct filtration must report monthly to the director the information

specified in paragraphs (1) and (2). In addition to the reporting and recordkeeping requirements in section 11-20-46(e), a public water system subject to the requirements of this section that provides filtration approved under subsection (c)(2) must report monthly to the director the information specified in paragraph (1). The reporting in paragraph (1) is in lieu of the reporting specified in section 11-20-46(e)(2)(A).

(1) Turbidity measurements as required by subsection (c) must be reported within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

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

(B) 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 subsection (c)(1) or (2).

(C) The date and value of any turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration, or which exceed the maximum level set by the director under subsection (c)(2).

(2) Systems must maintain the results of individual filter monitoring taken under subsection (d) for at least three years. Systems must report that they have conducted individual filter turbidity monitoring under subsection (d) within ten days after the end of each month the system serves water to the public. Systems must report individual filter turbidity measurement results taken under subsection (d) within ten days after the end of each month the system serves water to the public only if measurements demonstrate one or more of the conditions in subparagraphs (A) through (D). Systems that use lime softening may apply to the director for

alternative exceedance levels for the levels specified in subparagraphs (A) through (D) if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(A) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken fifteen minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(B) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken fifteen minutes apart at the end of the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(C) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements

taken fifteen minutes apart at any time in each of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within fourteen days of the exceedance and report that the self-assessment was conducted. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

(D) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken fifteen minutes apart at any time in each of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for the conduct of a comprehensive performance evaluation (CPE) by a third party approved by the director no later than thirty days following the exceedance and have the evaluation completed and submitted to the director no later than ninety days following the exceedance. The director may require systems that have undergone a CPE to subsequently perform a comprehensive technical assistance (CTA) evaluation if the CPE findings determine that a CTA, and the implementation of its recommendations by the system, have the potential to improve water quality in the plant effluent or in the distribution

system.

(3) Additional reporting requirements.

(A) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must consult with the State as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under section 11-20-18(c)(2)(C).

(B) If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the director under subsection (c)(2) for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration or diatomaceous earth filtration, the system must consult with the State as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under section 11-20-18(c)(2)(C).

(C) Public water systems with a surface water source or GWUDI source serving fewer than 10,000 people must report the results of optional monitoring, which show TTHM levels <0.064 mg/L and HAA5 levels <0.048 mg/L if that system wishes to forgo profiling, pursuant to subsection (b)(1). Other systems must report the commencement of disinfection profiling by July 1, 2003.

(4) Additional recordkeeping requirements. All systems subject to this section that are required to profile or calculate a benchmark under subsection (b) must keep their results, including raw data and analyses, indefinitely.

(f) Composite correction program. The director may require systems regulated under subsection (a) to perform a composite correction program

(CCP) and implement any follow up recommendations that result from the program.

(1) The director may require that a system perform a CCP if one of the following occurs:
   (A) A waterborne disease outbreak; or
   (B) System deficiencies are identified which:
      (i) Degrade water quality in the plant effluent or distribution system; or
      (ii) In the director's opinion, have the potential to result in an unreasonable risk to the health of persons served by the system.

(2) Third parties performing CCPs on behalf of the system must be approved by the director.

(g) Sanitary surveys. The director shall conduct sanitary surveys for all systems, regulated under subsection (a), no less frequently than every three years for community PWSs and every five years for non-community PWSs.

(1) Sanitary surveys shall address, as a minimum, the following eight components:
   (A) Source;
   (B) Treatment;
   (C) Distribution system;
   (D) Finished water storage;
   (E) Pumps, pump facilities, and controls;
   (F) Monitoring and reporting and data verification;
   (G) System management and operation; and
   (H) Operator compliance with state requirements

(2) Significant deficiencies are defined as any defect in a system's design, operation and maintenance, as well as any failure or malfunction of any system component, that the director determines to cause, or have the potential to cause, an immediate sanitary risk to health.
   (A) The director has determined that the following conditions meet the definition in this paragraph:
      (i) Source water infrastructure (wellhead or surface water intake) that is susceptible to harmful land use activities, pollution sources or water quality conditions that

indicate an immediate sanitary risk to an untreated ground water source or to the designed treatment capabilities of an existing water treatment plant, and are within the control of the PWS.

(ii) An unauthorized bypass around a water treatment plant which treats surface water or ground water under the direct influence of a surface water (GWUDI).

(iii) (Drainage, sewer, chemical, or raw water line cross connections that may allow contaminants to enter the drinking water system.

(iv) Potential backpressure and backsiphonage conditions, including those observed outside the PWS system (i.e. private property), which could impact the PWS' water system quality. As a minimum, a PWS must contact private property owners to resolve potential cross connection hazard to their distribution system.

(v) Tank contents are exposed to contamination due to corrosion, poorly designed or maintained roof-wall interface, roof vents, overflow or washout line piping, hatches, manways or any other unprotected openings.

(vi) Well contamination potential at pump discharge head including: vent or air line tubing openings into well column are not sealed properly; drain for packing lubrication water is plugged and lubrication water is either stagnant or harbors small animals.

(B) PWSs shall respond to the director in writing to significant deficiencies outlined in sanitary survey reports no later than forty-five calendar days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.

(C) PWSs subject to subparagraph (B) shall take the

necessary steps to correct significant deficiencies identified in sanitary survey reports if such deficiencies are within the control of the PWS and its governing body.

(D) Failure of a PWS to respond to the requirements of either subparagraph (B) or (C) shall constitute a violation of these rules and subject the system to administrative penalties under section 340E-8, HRS.

(3) Community PWSs meeting the criteria in the subparagraphs (A) through (E) may be eligible for sanitary surveys to be performed on their systems at a reduced frequency of no less than every five years. Community PWSs achieving this reduced frequency status must continue to meet the criteria in subparagraphs (A) through (E) for the period between surveys, or risk an immediate adjustment of their reduced frequency status by the director.

(A) No significant deficiencies identified in the system's most recent survey performed in compliance with this subsection;

(B) No waterborne disease outbreaks attributable to the system during the past five years;

(C) No violations of chapter 11-20 during the past five years;

(D) Evidence of an active cross connection control program; and

(E) Evidence of an up-to-date operator training and certification program.

(4) The director will review the system's disinfection profiling data, as defined in subsection (b)(2), whenever a sanitary survey is performed. [Eff and comp 11/30/02; am and comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.170, §141.172, §141.173, §141.174, §141.175)

§11-20-46.2 Enhanced treatment for Cryptosporidium

(a) General Requirements.

(1) The requirements of this section constitute national primary drinking water regulations. The regulations in this section establish or extend treatment technique requirements in lieu of maximum contaminant levels for Cryptosporidium. These requirements are in addition to requirements for filtration and disinfection in sections 11-20-46 and 11-20-46.1.

(2) Applicability. The requirements of this section apply to all subpart H systems, which are public water systems supplied by a surface water source and public water systems supplied by a ground water source under the direct influence of surface water.

(A) Wholesale systems, as defined in section 11-20-2, must comply with the requirements of this section based on the population of the largest system in the combined distribution system.

(B) The requirements of this section for filtered systems apply to systems required by National Primary Drinking Water Regulations to provide filtration treatment, whether or not the system is currently operating a filtration system.

(C) The requirements of this section for unfiltered systems apply only to unfiltered systems that timely met and continue to meet the filtration avoidance criteria in sections 11-20-46 and 11-20-46.1, as applicable.

(3) Requirements. Systems subject to this section must comply with the following requirements:

(A) Systems must conduct an initial and a second round of source water monitoring for each plant that treats a surface water or GWUDI source. This monitoring may include sampling for Cryptosporidium, E. coli, and turbidity as described in subsections (b) through (g), to determine what level, if any, of additional Cryptosporidium treatment they must provide.

(B) Systems that plan to make a significant change to their disinfection practice must develop

disinfection profiles and calculate disinfection benchmarks, as described in subsections (i) through (j).

(C) Filtered systems must determine their Cryptosporidium treatment bin classification as described in subsection (k) and provide additional treatment for Cryptosporidium, if required, as described in subsection (l). All unfiltered systems must provide treatment for Cryptosporidium as described in subsection (m). Filtered and unfiltered systems must implement Cryptosporidium treatment according to the schedule in subsection (n).

(D) Systems with uncovered finished water storage facilities must comply with the requirements to cover the facility or treat the discharge from the facility as described in subsection (o).

(E) Systems required to provide additional treatment for Cryptosporidium must implement microbial toolbox options that are designed and operated as described in sections (p) through (u).

(F) Systems must comply with the applicable recordkeeping and reporting requirements described in subsection (v) through (w).

(G) Systems must address significant deficiencies identified in sanitary surveys performed by EPA as described in subsection (x).

(b) Source water monitoring.

(1) Initial round of source water monitoring. Systems must conduct the following monitoring on the schedule in paragraph (3) unless they meet the monitoring exemption criteria in paragraph (4).

(A) Filtered systems serving at least 10,000 people must sample their source water for Cryptosporidium, E. coli, and turbidity at least monthly for 24 months.

(B) Unfiltered systems serving at least 10,000 people must sample their source water for Cryptosporidium at least monthly for 24 months.

(C) Filtered systems serving fewer than 10,000 people must sample their source water for E.

coli at least once every two weeks for 12 months. A filtered system serving fewer than 10,000 people may avoid E. coli monitoring if the system notifies the State that it will monitor for Cryptosporidium as described in subparagraph (D). The system must notify the State no later than 3 months prior to the date the system is otherwise required to start E. coli monitoring under paragraph (3).

(D) Filtered systems serving fewer than 10,000 people must sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months if they meet one of the following, based on monitoring conducted under subparagraph (C):

(i) For systems using lake/reservoir sources, the annual mean E. coli concentration is greater than 10 E. coli/100 mL.

(ii) For systems using flowing stream sources, the annual mean E. coli concentration is greater than 50 E. coli/100 mL.

(iii) The system does not conduct E. coli monitoring as described in subparagraph (C).

(iv) Systems using ground water under the direct influence of surface water (GWUDI) must comply with the requirements of this subparagraph based on the E. coli level that applies to the nearest surface water body. If no surface water body is nearby, the system must comply based on the requirements that apply to systems using lake/reservoir sources.

(E) For filtered systems serving fewer than 10,000 people, the State may approve monitoring for an indicator other than E. coli under subparagraph (C). The State also may approve an alternative to the E. coli concentration in clauses (D)(i),(ii) and (iv) to trigger Cryptosporidium monitoring. This approval by the State must be provided to the system in writing and must include the basis for the State's determination

that the alternative indicator and/or trigger level will provide a more accurate identification of whether a system will exceed the Bin 1 Cryptosporidium level in subsection (k).

(F) Unfiltered systems serving fewer than 10,000 people must sample their source water for Cryptosporidium at least twice per month for 12 months or at least monthly for 24 months.

(G) Systems may sample more frequently than required under this section if the sampling frequency is evenly spaced throughout the monitoring period.

(2) Second round of source water monitoring. Systems must conduct a second round of source water monitoring that meets the requirements for monitoring parameters, frequency, and duration described in paragraph (1), unless they meet the monitoring exemption criteria in paragraph (4). Systems must conduct this monitoring on the schedule in paragraph (3).

(3) Monitoring schedule. Systems must begin the monitoring required in paragraphs (1) and (2) no later than the month beginning with the date listed in this table:

Source Water Monitoring Starting Dates Table

Systems that serve ...	Must begin the first round of source water monitoring no later than the month beginning ...	And must begin the second round of source water monitoring no later than the month beginning...
At least 100,000 people.	October 1, 2006	April 1, 2015
From 50,000 to 99,999 people.	April 1, 2007	October 1, 2015
From 10,000 to 49,999 people.	April 1, 2008	October 1, 2016

Systems that serve ...	Must begin the first round of source water monitoring no later than the month beginning ...	And must begin the second round of source water monitoring no later than the month beginning...
Fewer than 10,000 and monitor for E. coli[1].	October 1, 2008	October 1, 2017
Fewer than 10,000 and monitor for Cryptosporidium[2]	April 1, 2010	April 1, 2019

[1]Applies only to filtered systems.
[2]Applies to filtered systems that meet the conditions of subparagraph (1)(D) and unfiltered systems.

(4) Monitoring avoidance.

(A) Filtered systems are not required to conduct source water monitoring under this section if the system will provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in subsection (l).

(B) Unfiltered systems are not required to conduct source water monitoring under this section if the system will provide a total of at least 3-log Cryptosporidium inactivation, equivalent to meeting the treatment requirements for unfiltered systems with a mean Cryptosporidium concentration of greater than 0.01 oocysts/L in subsection (m).

(C) If a system chooses to provide the level of treatment in subparagraphs (A) or (B), as applicable, rather than start source water monitoring, the system must notify the State in writing no later than the date the system is otherwise required to submit a sampling schedule for monitoring under subsection (c). Alternatively, a system may choose to stop sampling at any point after it has initiated monitoring if it notifies the State in writing

that it will provide this level of treatment. Systems must install and operate technologies to provide this level of treatment by the applicable treatment compliance date in subsection (n).

(5) Plants operating only part of the year. Systems with subpart H plants that operate for only part of the year must conduct source water monitoring in accordance with this section, but with the following modifications:

(A) Systems must sample their source water only during the months that the plant operates unless the State specifies another monitoring period based on plant operating practices.

(B) Systems with plants that operate less than six months per year and that monitor for Cryptosporidium must collect at least six Cryptosporidium samples per year during each of two years of monitoring. Samples must be evenly spaced throughout the period the plant operates.

(6) New sources.

(A) A system that begins using a new source of surface water or GWUDI after the system is required to begin monitoring under paragraph (3) must monitor the new source on a schedule the State approves. Source water monitoring must meet the requirements of this section. The system must also meet the bin classification and Cryptosporidium treatment requirements of subsections (k), (l), and (m), as applicable, for the new source on a schedule the State approves.

(B) The requirements of this paragraph apply to subpart H systems that begin operation after the monitoring start date applicable to the system's size under paragraph (3).

(C) The system must begin a second round of source water monitoring no later than 6 years following initial bin classification under subsection (k) or determination of the mean Cryptosporidium level under subsection (m), as applicable.

(7) Failure to collect any source water sample required under this section in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements of subsections (c) through (g) is a monitoring violation.

(8) Grandfathering monitoring data. Systems may use (grandfather) monitoring data collected prior to the applicable monitoring start date in paragraph (3) to meet the initial source water monitoring requirements in paragraph (1). Grandfathered data may substitute for an equivalent number of months at the end of the monitoring period. All data submitted under this paragraph must meet the requirements in subsection (h).

(c) Sampling schedules.

(1) Systems required to conduct source water monitoring under subsection (b) must submit a sampling schedule that specifies the calendar dates when the system will collect each required sample.

(A) Systems must submit sampling schedules no later than 3 months prior to the applicable date listed in paragraph (b)(3) for each round of required monitoring.

(B) Systems serving at least 10,000 people must submit their sampling schedule for the initial round of source water monitoring under paragraph (b)(1) to EPA electronically at https://intranet.epa.gov/lt2/. If a system is unable to submit the sampling schedule electronically, the system may use an alternative approach for submitting the sampling schedule that EPA approves.

(C) Systems serving fewer than 10,000 people must submit their sampling schedules for the initial round of source water monitoring paragraph (b)(1) to the State.

(D) Systems must submit sampling schedules for the second round of source water monitoring paragraph (b)(2) to the State.

(E) If EPA or the State does not respond to a system regarding its sampling schedule, the system

must sample at the reported schedule.

(2) Systems must collect samples within two days before or two days after the dates indicated in their sampling schedule (i.e., within a five-day period around the schedule date) unless one of the conditions of subparagraph (A) or (B) applies.

(A) If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the system to be unable to sample in the scheduled five-day period, the system must sample as close to the scheduled date as is feasible unless the State approves an alternative sampling date. The system must submit an explanation for the delayed sampling date to the State concurrent with the shipment of the sample to the laboratory.

(B) If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements in subsection (e), or the failure of an approved laboratory to analyze the sample, then the system must collect a replacement sample. The system must collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless the system demonstrates that collecting a replacement sample within this time frame is not feasible or the State approves an alternative resampling date. The system must submit an explanation for the delayed sampling date to the State concurrent with the shipment of the sample to the laboratory.

(3) Systems that fail to meet the criteria of paragraph (2) for any source water sample required under subsection (b) must revise their sampling schedules to add dates for collecting all missed samples. Systems must submit the revised schedule to the State for approval prior to when the system begins

collecting the missed samples.

(d) Sampling locations.

(1) Systems required to conduct source water monitoring under subsection (b) must collect samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the State may approve one set of monitoring results to be used to satisfy the requirements of subsection (b) for all plants.

(2) Systems must collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants, unless the system meets the condition of this paragraph. The State may approve a system to collect a source water sample after chemical treatment. To grant this approval, the State must determine that collecting a sample prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

(3) Systems that recycle filter backwash water must collect source water samples prior to the point of filter backwash water addition.

(4) Bank filtration. Systems that receive Cryptosporidium treatment credit for bank filtration under paragraph 11-20-46.1(c)(2), as applicable, must collect source water samples in the surface water prior to bank filtration. Systems that use bank filtration as pretreatment to a filtration plant must collect source water samples from the well (i.e., after bank filtration). Use of bank filtration during monitoring must be consistent with routine operational practice. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under paragraph (r)(3).

(5) Multiple sources. Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources, must collect samples as specified in paragraph (A) or (B). The use of multiple sources during monitoring must be consistent with routine

operational practice.

(A) If a sampling tap is available where the sources are combined prior to treatment, systems must collect samples from the tap.

(B) If a sampling tap where the sources are combined prior to treatment is not available, systems must collect samples at each source near the intake on the same day and must follow either clauses (i) or (ii) for sample analysis.

(i) Systems may composite samples from each source into one sample prior to analysis. The volume of sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

(ii) Systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average must be calculated by multiplying the analysis result for each source by the fraction the source contributed to total plant flow at the time the sample was collected and then summing these values.

(6) Additional Requirements. Systems must submit a description of their sampling location(s) to the State at the same time as the sampling schedule required under subsection (c). This description must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. If the State does not respond to a system regarding sampling location(s), the system must sample at the reported location(s).

(e) Analytical methods.

(1) Cryptosporidium. Systems must analyze for Cryptosporidium using Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005, United States Environmental Protection Agency, EPA--815-R--05--002 or Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005, United States

Environmental Protection Agency, EPA--815--R--05--001, which are incorporated by reference or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 C.F.R. part 51. You may obtain a copy of these methods online from http://www.epa.gov/safewater/disinfection/lt2 or from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave., NW, Washington, DC 20460 (Telephone: 800--426--4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202--566--2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202--741--6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(A) Systems must analyze at least a 10 L sample or a packed pellet volume of at least 2 mL as generated by the methods listed in this paragraph. Systems unable to process a 10 L sample must analyze as much sample volume as can be filtered by two filters approved by EPA for the methods listed in this paragraph, up to a packed pellet volume of at least 2 mL.

(B) Matrix spike (MS) samples, as required by the methods in this paragraph, must be spiked and filtered by a laboratory approved for Cryptosporidium analysis under subsection (f). If the volume of the MS sample is greater than 10 L, the system may filter all but 10 L of the MS sample in the field, and ship the filtered sample and the remaining 10 L of source water to the laboratory. In this case, the laboratory must spike the remaining 10 L of water and filter it through the filter used to collect the balance of the sample in the field.

(C) Flow cytometer-counted spiking suspensions

must be used for MS samples and ongoing precision and recovery (OPR) samples.

(2) E. coli. Systems must use methods for enumeration of E. coli in source water approved in 40 C.F.R. 136.3(a).

(A) The time from sample collection to initiation of analysis may not exceed 30 hours unless the system meets the condition of paragraph (B).

(B) The State may approve on a case-by-case basis the holding of an E. coli sample for up to 48 hours between sample collection and initiation of analysis if the State determines that analyzing an E. coli sample within 30 hours is not feasible. E. coli samples held between 30 to 48 hours must be analyzed by the Colilert reagent version of Standard Method 9223B as listed in 40 C.F.R. 136.3(a) of this title or alternative methods listed in Appendix A to Title 40 Code of Federal Regulations, Part 141, Subpart C.

(C) Systems must maintain samples between 0 °C and 10 °C during storage and transit to the laboratory.

(3) Turbidity. Systems must use methods for turbidity measurement approved in 40 C.F.R. 141.74(a)(1).

(f) Approved laboratories.

(1) Cryptosporidium. Systems must have Cryptosporidium samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium in Water or a laboratory that has been certified for Cryptosporidium analysis by an equivalent State laboratory certification program.

(2) E. coli. Any laboratory certified by the EPA, the National Environmental Laboratory Accreditation Conference or the State for total coliform or fecal coliform analysis under 40 C.F.R. 141.74 is approved for E. coli analysis under this section when the laboratory uses the same technique for E. coli that the laboratory uses for 40 C.F.R. 141.74.

(3) Turbidity. Measurements of turbidity must be made by a party approved by the State.

(g) Reporting source water monitoring results.

(1) Systems must report results from the source water monitoring required under subsection (b) no later than 10 days after the end of the first month following the month when the sample is collected.

(2) All systems serving at least 10,000 people must report the results from the initial source water monitoring required under paragraph (b)(1) to EPA electronically at https://intranet.epa.gov/lt2/. If a system is unable to report monitoring results electronically, the system may use an alternative approach for reporting monitoring results that EPA approves.

(3) Systems serving fewer than 10,000 people must report results from the initial source water monitoring required under paragraph (b)(1) to the State.

(4) All systems must report results from the second round of source water monitoring required under paragraph (b)(2) to the State.

(5) Systems must report the applicable information in subparagraphs (A) and (B) for the source water monitoring required under subsection (b).

(A) Systems must report the following data elements for each Cryptosporidium analysis:

Data element.
PWS ID.
Facility ID.
Sample collection date.
Sample type (field or matrix spike).
Sample volume filtered(L), to nearest 1/4 L.
Was 100% of filtered volume examined.
Number of oocysts counted.

(i) For matrix spike samples, systems must also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(ii) For samples in which less than 10 L is filtered or less than 100% of the sample volume is examined, systems must also report the number of filters used and the

packed pellet volume.

(iii) For samples in which less than 100% of sample volume is examined, systems must also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(B) Systems must report the following data elements for each E. coli analysis:

Data element.
PWS ID.
Facility ID.
Sample collection date.
Analytical method number.
Method type.
Source type (flowing stream, lake/reservoir, GWUDI).
E. coli/100 mL.
Turbidity. \1\

\1\ Systems serving fewer than 10,000 people that are not required to monitor for turbidity under subsection (b) are not required to report turbidity with their E. coli results.

(h) Grandfathering previously collected data.

(1) Systems may comply with the initial source water monitoring requirements of paragraph (b)(1) by grandfathering sample results collected before the system is required to begin monitoring (i.e., previously collected data). To be grandfathered, the sample results and analysis must meet the criteria in this section and the State must approve. A filtered system may grandfather Cryptosporidium samples to meet the requirements of paragraph (b)(1) when the system does not have corresponding E. coli and turbidity samples. A system that grandfathers Cryptosporidium samples without E. coli and turbidity samples is not required to collect E. coli and turbidity samples when the system completes the requirements for Cryptosporidium monitoring under paragraph (b)(1).

(2) E. coli sample analysis. The analysis of E. coli samples must meet the analytical method and approved laboratory requirements of subsection (e) through (f).

(3) Cryptosporidium sample analysis. The analysis of Cryptosporidium samples must meet the criteria in this paragraph.

(A) Laboratories analyzed Cryptosporidium samples using one of the analytical methods in clauses (i) through (vi), which are incorporated by reference. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 C.F.R. part 51. You may obtain a copy of these methods on-line from the United States Environmental Protection Agency, Office of Ground Water and Drinking Water, 1201 Constitution Ave, NW, Washington, DC 20460 (Telephone: 800--426--4791). You may inspect a copy at the Water Docket in the EPA Docket Center, 1301 Constitution Ave., NW, Washington, DC, (Telephone: 202--566--2426) or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202--741--6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(i) Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2005, United States Environmental Protection Agency, EPA--815--R--05--002.

(ii) Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2005, United States Environmental Protection Agency, EPA--815--R--05--001.

(iii) Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 2001, United States Environmental Protection Agency, EPA--821--R--01--025.

(iv) Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 2001, United States

Environmental Protection Agency, EPA--821---R--01--026.

(v) Method 1623: Cryptosporidium and Giardia in Water by Filtration/IMS/FA, 1999, United States Environmental Protection Agency, EPA--821--R--99--006.

(vi) Method 1622: Cryptosporidium in Water by Filtration/IMS/FA, 1999, United States Environmental Protection Agency, EPA--821--R--99--001.

(B) For each Cryptosporidium sample, the laboratory analyzed at least 10 L of sample or at least 2 mL of packed pellet or as much volume as could be filtered by 2 filters that EPA approved for the methods listed in subparagraph (A).

(4) Sampling location. The sampling location must meet the conditions in subsection (d).

(5) Sampling frequency. Cryptosporidium samples were collected no less frequently than each calendar month on a regular schedule, beginning no earlier than January 1999. Sample collection intervals may vary for the conditions specified in subparagraphs (c)(2)(A) and (B) if the system provides documentation of the condition when reporting monitoring results.

(A) The State may approve grandfathering of previously collected data where there are time gaps in the sampling frequency if the system conducts additional monitoring the State specifies to ensure that the data used to comply with the initial source water monitoring requirements of paragraph (b)(1) are seasonally representative and unbiased.

(B) Systems may grandfather previously collected data where the sampling frequency within each month varied. If the Cryptosporidium sampling frequency varied, systems must follow the monthly averaging procedure in subparagraphs (k)(2)(E) or (m)(1)(C), as applicable, when calculating the bin classification for filtered systems or the mean Cryptosporidium concentration for unfiltered systems.

(6) Reporting monitoring results for grandfathering. Systems that request to grandfather previously collected monitoring results must report the following information by the applicable dates listed in this paragraph. Systems serving at least 10,000 people must report this information to EPA unless the State approves reporting to the State rather than EPA. Systems serving fewer than 10,000 people must report this information to the State.

(A) Systems must report that they intend to submit previously collected monitoring results for grandfathering. This report must specify the number of previously collected results the system will submit, the dates of the first and last sample, and whether a system will conduct additional source water monitoring to meet the requirements of paragraph (b)(1). Systems must report this information no later than the date the sampling schedule under subsection (c) is required.

(B) Systems must report previously collected monitoring results for grandfathering, along with the associated documentation listed in clauses (i) through (iv), no later than two months after the applicable date listed in paragraph (b)(3).

(i) For each sample result, systems must report the applicable data elements in subsection (g).

(ii) Systems must certify that the reported monitoring results include all results the system generated during the time period beginning with the first reported result and ending with the final reported result. This applies to samples that were collected from the sampling location specified for source water monitoring under this section, not spiked, and analyzed using the laboratory's routine process for the analytical methods listed in this section.

(iii) Systems must certify that the samples were

representative of a plant's source water(s) and the source water(s) have not changed. Systems must report a description of the sampling location(s), which must address the position of the sampling location in relation to the system's water source(s) and treatment processes, including points of chemical addition and filter backwash recycle.

(iv) For Cryptosporidium samples, the laboratory or laboratories that analyzed the samples must provide a letter certifying that the quality control criteria specified in the methods listed in subparagraph (3)(A) were met for each sample batch associated with the reported results. Alternatively, the laboratory may provide bench sheets and sample examination report forms for each field, matrix spike, IPR, OPR, and method blank sample associated with the reported results.

(7) If the State determines that a previously collected data set submitted for grandfathering was generated during source water conditions that were not normal for the system, such as a drought, the State may disapprove the data. Alternatively, the State may approve the previously collected data if the system reports additional source water monitoring data, as determined by the State, to ensure that the data set used under subsection (k) or subsection (m) represents average source water conditions for the system.

(8) If a system submits previously collected data that fully meet the number of samples required for initial source water monitoring under paragraph (b)(1) and some of the data are rejected due to not meeting the requirements of this section, systems must conduct additional monitoring to replace rejected data on a schedule the State approves. Systems are not required to begin this additional monitoring until two months after notification that data have been rejected and

additional monitoring is necessary.

(i) Requirements when making a significant change in disinfection practice.

(1) Following the completion of initial source water monitoring under paragraph (b)(1), a system that plans to make a significant change to its disinfection practice, as defined in paragraph (2), must develop disinfection profiles and calculate disinfection benchmarks for Giardia lamblia and viruses as described in subsection (j). Prior to changing the disinfection practice, the system must notify the State and must include in this notice the information in subparagraphs (A) through (C).

(A) A completed disinfection profile and disinfection benchmark for Giardia lamblia and viruses as described in subsection (j).

(B) A description of the proposed change in disinfection practice.

(C) An analysis of how the proposed change will affect the current level of disinfection.

(2) Significant changes to disinfection practice are defined as follows:

(A) Changes to the point of disinfection;

(B) Changes to the disinfectant(s) used in the treatment plant;

(C) Changes to the disinfection process; or

(D) Any other modification identified by the State as a significant change to disinfection practice.

(j) Developing the disinfection profile and benchmark.

(1) Systems required to develop disinfection profiles under subsection (i) must follow the requirements of this section. Systems must monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for Giardia lamblia and viruses. If systems monitor more frequently, the monitoring frequency must be evenly spaced. Systems that operate for fewer than 12 months per year must monitor weekly during the period of operation. Systems must determine log inactivation for Giardia lamblia through the entire plant, based on $CT_{99.9}$ values in Tables 1.1 through 1.6, 2.1 and 3.1 of 40

C.F.R. 141.74(b) as applicable. Systems must determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the State.

(2) Systems with a single point of disinfectant application prior to the entrance to the distribution system must conduct the monitoring in subparagraphs (A) through (D). Systems with more than one point of disinfectant application must conduct the monitoring in subparagraphs (A) through (D) for each disinfection segment. Systems must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in 40 C.F.R. 141.74(a).

(A) For systems using a disinfectant other than UV, the temperature of the disinfected water must be measured at each residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the State.

(B) For systems using chlorine, the pH of the disinfected water must be measured at each chlorine residual disinfectant concentration sampling point during peak hourly flow or at an alternative location approved by the State.

(C) The disinfectant contact time(s) (t) must be determined during peak hourly flow.

(D) The residual disinfectant concentration(s) (C) of the water before or at the first customer and prior to each additional point of disinfectant application must be measured during peak hourly flow.

(3) In lieu of conducting new monitoring under paragraph (2), systems may elect to meet the requirements of subparagraphs (A) or (B).

(A) Systems that have at least one year of existing data that are substantially equivalent to data collected under the provisions of paragraph (b) may use these data to develop disinfection profiles as specified in this section if the system has neither made a significant change to its treatment practice nor changed sources

since the data were collected. Systems may develop disinfection profiles using up to three years of existing data.

(B) Systems may use disinfection profile(s) developed under subsection 11-20-46.1(b) in lieu of developing a new profile if the system has neither made a significant change to its treatment practice nor changed sources since the profile was developed. Systems that have not developed a virus profile under subsection 11-20-46.1(b) must develop a virus profile using the same monitoring data on which the Giardia lamblia profile is based.

(4) Systems must calculate the total inactivation ratio for Giardia lamblia as specified in subparagraphs (A) through (C).

(A) Systems using only one point of disinfectant application may determine the total inactivation ratio for the disinfection segment based on either of the methods in clauses (i) or (ii).

(i) Determine one inactivation ratio ($CTcalc/CT_{99.9}$) before or at the first customer during peak hourly flow.

(ii) Determine successive $CTcalc/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. The system must calculate the total inactivation ratio by determining ($CTcalc/CT_{99.9}$) for each sequence and then adding the ($CTcalc/CT_{99.9}$) values together to determine (ΣS ($CTcalc/CT_{99.9}$)).

(B) Systems using more than one point of disinfectant application before the first customer must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The ($CTcalc/CT_{99.9}$) value of each segment and (ΣS

($CTcalc/CT_{99.9}$)) must be calculated using the method in paragraph (d)(1)(ii).

(C) The system must determine the total logs of inactivation by multiplying the value calculated in subparagraphs (A) or (B) by 3.0.

(D) Systems must calculate the log of inactivation for viruses using a protocol approved by the State.

(5) Systems must use the procedures specified in subparagraphs (A) and (B) to calculate a disinfection benchmark.

(A) For each year of profiling data collected and calculated under paragraphs (1) through (4), systems must determine the lowest mean monthly level of both Giardia lamblia and virus inactivation. Systems must determine the mean Giardia lamblia and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly Giardia lamblia and virus log inactivation by the number of values calculated for that month.

(B) The disinfection benchmark is the lowest monthly mean value (for systems with one year of profiling data) or the mean of the lowest monthly mean values (for systems with more than one year of profiling data) of Giardia lamblia and virus log inactivation in each year of profiling data.

(k) Bin classification for filtered systems.

(1) Following completion of the initial round of source water monitoring required under paragraph (b)(1), filtered systems must calculate an initial Cryptosporidium bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the Cryptosporidium results reported under paragraph (b)(1) and must follow the procedures in subparagraphs (2)(A) through (E).

(2) Compliance Calculations

(A) For systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

(B) For systems that collect a total of at least 24 samples, but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which Cryptosporidium samples were collected.

(C) For systems that serve fewer than 10,000 people and monitor for Cryptosporidium for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

(D) For systems with plants operating only part of the year that monitor fewer than 12 months per year under paragraph (b)(5), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of Cryptosporidium monitoring.

(E) If the monthly Cryptosporidium sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in subparagraphs (2)(A) through (D).

(3) Filtered systems must determine their initial bin classification from the following table and using the Cryptosporidium bin concentration calculated under paragraphs (1) and (2):

For systems that are...	With a Cryptosporidium concentration of...[1]	The bin classification is...
...required to monitor for Cryptosporidium under subsection (b).	Cryptosporidium <0.075 oocysts/L	Bin 1
	0.075 oocysts/L < Cryptosporidium <1.0 oocysts/L	Bin 2
	1.0 oocysts/L < Cryptosporidium <3.0 oocysts/L	Bin 3
	Cryptosporidium >3.0 oocysts/L	Bin 4

For systems that are...	With a Cryptosporidium concentration of...[1]	The bin classification is...
...serving fewer than 10,000 and NOT required to monitor for Cryptosporidium under subparagraph (b)(1)(D)	N/A	Bin 1

[1]Based on calculations in paragraphs (1) or (4), as applicable.

(4) Following completion of the second round of source water monitoring required under paragraph (b)(2), filtered systems must recalculate their Cryptosporidium bin concentration using the Cryptosporidium results reported under paragraph (b)(2) and following the procedures in subparagraphs (2)(A) through (D). Systems must then redetermine their bin classification using this bin concentration and the table in paragraph (3).

(5) Filtered systems must report their initial bin classification under paragraph (3) to the State for approval no later than 6 months after the system is required to complete initial source water monitoring based on the schedule in paragraph (b)(3). Systems must report their bin classification under paragraph (4) to the State for approval no later than 6 months after the system is required to complete the second round of source water monitoring based on the schedule in paragraph (b)(3). The bin classification report to the State must include a summary of source water monitoring data and the calculation procedure used to determine bin classification.

(6) Failure to comply with the conditions of paragraph (5) is a violation of the treatment technique requirement.

(l) Filtered system additional Cryptosporidium

treatment requirements.

(1) Filtered systems must provide the level of additional treatment for Cryptosporidium specified in this paragraph based on their bin classification as determined under subsection (k) and according to the schedule in subsection (n).

If the system bin classification is…	And the system uses the following filtration treatment in full compliance with sections 11-20-46 and 11-20-46.1 (as applicable), then the additional Cryptosporidium treatment requirements are . . .			
	Conventional filtration treatment (including softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies
Bin 1	No additional treatment	No additional treatment	No additional treatment	No additional treatment
Bin 2	1-log treatment	1.5-log treatment	1-log treatment	See footnote 1
Bin 3	2-log treatment	2.5-log treatment	2-log treatment	See footnote 2
Bin 4	2.5 log treatment	3-log treatment	2.5 log treatment	See footnote 3

[1]As determined by the State such that the total Cryptosporidium removal and inactivation is at least 4.0-log.

[2]As determined by the State such that the total Cryptosporidium removal and inactivation is at least 5.0-log.

[3]As determined by the State such that the total Cryptosporidium removal and inactivation is at least 5.5-log.

(2) Filtered systems must use one or more of the treatment and management options listed in subsection (p), termed the microbial toolbox, to comply with the additional Cryptosporidium treatment required in

paragraph (1). Systems classified in Bin 3 and Bin 4 must achieve at least 1-log of the additional Cryptosporidium treatment required under paragraph (1) using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in subsections (q) through (u).

(3) Failure by a system in any month to achieve treatment credit by meeting criteria in subsections (q) through (u) for microbial toolbox options that is at least equal to the level of treatment required in paragraph (1) is a violation of the treatment technique requirement.

(4) If the State determines during a sanitary survey or an equivalent source water assessment that after a system completed the monitoring conducted under paragraphs (b)(1) or (2), significant changes occurred in the system's watershed that could lead to increased contamination of the source water by Cryptosporidium, the system must take actions specified by the State to address the contamination. These actions may include additional source water monitoring and/or implementing microbial toolbox options listed in subsection (p).

(m) Unfiltered system Cryptosporidium treatment requirements.

(1) Determination of mean Cryptosporidium level.

(A) Following completion of the initial source water monitoring required under paragraph (b)(1), unfiltered systems must calculate the arithmetic mean of all Cryptosporidium sample concentrations reported under paragraph (b)(1). Systems must report this value to the State for approval no later than 6 months after the month the system is required to complete initial source water monitoring based on the schedule in paragraph (b)(3).

(B) Following completion of the second round of source water monitoring required under paragraph (b)(2), unfiltered systems must calculate the arithmetic mean of all Cryptosporidium sample concentrations reported

under paragraph (b)(2). Systems must report this value to the State for approval no later than 6 months after the month the system is required to complete the second round of source water monitoring based on the schedule in paragraph (b)(3).

(C) If the monthly Cryptosporidium sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the calculation of the mean Cryptosporidium level in subparagraphs (A) and (B).

(D) The report to the State of the mean Cryptosporidium levels calculated under subparagraphs (A) and (B) must include a summary of the source water monitoring data used for the calculation.

(E) Failure to comply with the conditions of paragraph (1) is a violation of the treatment technique requirement.

(2) Cryptosporidium inactivation requirements. Unfiltered systems must provide the level of inactivation for Cryptosporidium specified in this paragraph, based on their mean Cryptosporidium levels as determined under paragraph (1) and according to the schedule in subsection (n).

(A) Unfiltered systems with a mean Cryptosporidium level of 0.01 oocysts/L or less must provide at least 2-log Cryptosporidium inactivation.

(B) Unfiltered systems with a mean Cryptosporidium level of greater than 0.01 oocysts/L must provide at least 3-log Cryptosporidium inactivation.

(3) Inactivation treatment technology requirements. Unfiltered systems must use chlorine dioxide, ozone, or UV as described in subsection (u) to meet the Cryptosporidium inactivation requirements of this section.

(A) Systems that use chlorine dioxide or ozone and fail to achieve the Cryptosporidium

inactivation required in paragraph (2) on more than one day in the calendar month are in violation of the treatment technique requirement.

(B) Systems that use UV light and fail to achieve the Cryptosporidium inactivation required in paragraph (2) by meeting the criteria in clause (u)(4)(C)(ii) are in violation of the treatment technique requirement.

(4) Use of two disinfectants. Unfiltered systems must meet the combined Cryptosporidium inactivation requirements of this section and Giardia lamblia and virus inactivation requirements of 40 C.F.R. 141.72(a) using a minimum of two disinfectants, and each of two disinfectants must separately achieve the total inactivation required for either Cryptosporidium, Giardia lamblia, or viruses.

(n) Schedule for compliance with Cryptosporidium treatment requirements.

(1) Following initial bin classification under paragraph (k)(3), filtered systems must provide the level of treatment for Cryptosporidium required under subsection (l) according to the schedule in paragraph (3).

(2) Following initial determination of the mean Cryptosporidium level under subparagraph (m)(1)(A), unfiltered systems must provide the level of treatment for Cryptosporidium required under subparagraph (m) according to the schedule in paragraph (3).

(3) Cryptosporidium treatment compliance dates.

Cryptosporidium Treatment Compliance Dates Table

Systems that serve...	Must comply with Cryptosporidium treatment requirements no later than...[1]
At least 100,000 people	April 1, 2012
From 50,000 to 99,999 people	October 1, 2012
From 10,000 to 49,999 people	October 1, 2013
Fewer than 10,000 people	October 1, 2014

[1]States may allow up to an additional two years for complying with the treatment requirement for systems making capital improvements.

(4) If the bin classification for a filtered system changes following the second round of source water monitoring, as determined under paragraph (k)(4), the system must provide the level of treatment for Cryptosporidium required under subsection (l) on a schedule the State approves.

(5) If the mean Cryptosporidium level for an unfiltered system changes following the second round of monitoring, as determined under subparagraph (m)(1)(B), and if the system must provide a different level of Cryptosporidium treatment under subsection (m) due to this change, the system must meet this treatment requirement on a schedule the State approves.

(o) Requirements for uncovered finished water storage facilities.

(1) Systems using uncovered finished water storage facilities must comply with the conditions of this section.

(2) Systems must notify the State of the use of each uncovered finished water storage facility no later than April 1, 2008.

(3) Systems must meet the conditions of subparagraph (A) or (B) for each uncovered finished water storage facility or be in compliance with a State-approved schedule to meet these conditions no later than April 1, 2009.

(A) Systems must cover any uncovered finished water storage facility.

(B) Systems must treat the discharge from the uncovered finished water storage facility to the distribution system to achieve inactivation and/or removal of at least 4-log virus, 3-log Giardia lamblia, and 2-log Cryptosporidium using a protocol approved by the State.

(4) Failure to comply with the requirements of this section is a violation of the treatment technique requirement.

(p) Microbial toolbox options for meeting Cryptosporidium treatment requirements.

(1) Systems receive the treatment credits listed in the table in paragraph (2) by meeting the conditions for microbial toolbox options described in subsections (q) through (u). Systems apply these treatment credits to meet the treatment requirements in subsections (l) or (m), as applicable. Unfiltered systems are eligible for treatment credits for the microbial toolbox options described in subsection (u) only.

(2) The following table summarizes options in the microbial toolbox:

Microbial Toolbox Summary Table:
Options, Treatment Credits and Criteria

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Source Protection and Management Toolbox Options	
Watershed control program	0.5-log credit for State-approved program comprising required elements, annual program status report to State, and regular watershed survey. Unfiltered systems are not eligible for credit. Specific criteria are in paragraph (q)(1).
Alternative source/intake management	No prescribed credit. Systems may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. Specific criteria are in paragraph (q)(2).

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Pre Filtration Toolbox Options	
Presedimentation basin with coagulation	0.5-log credit during any month that presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative State-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through basins. Specific criteria are in paragraph (r)(1).
Two-stage lime softening	0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment. Specific criteria are in paragraph (r)(2).

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Bank filtration	0.5-log credit for 25-foot setback; 1.0-log credit for 50-foot setback; aquifer must be unconsolidated sand containing at least 10 percent fines; average turbidity in wells must be less than 1 NTU. Systems using wells followed by filtration when conducting source water monitoring must sample the well to determine bin classification and are not eligible for additional credit. Specific criteria are in paragraph (r)(3).
Treatment Performance Toolbox Options	
Combined filter performance	0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95 percent of measurements each month. Specific criteria are in paragraph (s)(1).
Individual filter performance	0.5-log credit (in addition to 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter. Specific criteria are in paragraph (s)(2).

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Demonstration of performance	Credit awarded to unit process or treatment train based on a demonstration to the State with a State-approved protocol. Specific criteria are in paragraph (s)(3).
Additional Filtration Toolbox Options	
Bag or cartridge filters (individual filters)	Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety. Specific criteria are in paragraph (t)(1).
Bag or cartridge filters (in series)	Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety. Specific criteria are in paragraph (t)(1).
Membrane filtration	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. Specific criteria are in paragraph (t)(2).
Second stage filtration	0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter. Specific criteria are in paragraph (t)(3).

Toolbox Option	Cryptosporidium treatment credit with design and implementation criteria
Slow sand filters	2.5-log credit as a secondary filtration step; 3.0-log credit as a primary filtration process. No prior chlorination for either option. Specific criteria are in paragraph (t)(4).
Inactivation Toolbox Options	
Chlorine dioxide	Log credit based on measured CT in relation to CT table. Specific criteria in paragraph (u)(2).
Ozone	Log credit based on measured CT in relation to CT table. Specific criteria in paragraph (u)(2).
UV	Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions. Specific criteria in paragraph (u)(4).

(q) Source toolbox components.

(1) Watershed control program. Systems receive 0.5-log Cryptosporidium treatment credit for implementing a watershed control program that meets the requirements of this section.

(A) Systems that intend to apply for the watershed control program credit must notify the State of this intent no later than two years prior to the treatment compliance date applicable to the system in subsection (n).

(B) Systems must submit to the State a proposed

watershed control plan no later than one year before the applicable treatment compliance date in subsection (n). The State must approve the watershed control plan for the system to receive watershed control program treatment credit. The watershed control plan must include the elements in clauses (i) through (iv).

(i) Identification of an ""area of influence"" outside of which the likelihood of Cryptosporidium or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under clause (1)(E)(ii).

(ii) Identification of both potential and actual sources of Cryptosporidium contamination and an assessment of the relative impact of these sources on the system's source water quality.

(iii) An analysis of the effectiveness and feasibility of control measures that could reduce Cryptosporidium loading from sources of contamination to the system's source water.

(iv) A statement of goals and specific actions the system will undertake to reduce source water Cryptosporidium levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(C) Systems with existing watershed control programs (i.e., programs in place on January 5, 2006) are eligible to seek this credit. Their watershed control plans must meet the criteria in subparagraph (1)(B) and must specify ongoing and future actions that will reduce source water Cryptosporidium levels.

(D) If the State does not respond to a system regarding approval of a watershed control plan submitted under this section and the system meets the other requirements of this section, the watershed control program will be considered approved and 0.5 log Cryptosporidium treatment credit will be awarded unless and until the State subsequently withdraws such approval.

(E) Systems must complete the actions in clauses (i) through (iii) to maintain the 0.5-log credit.

(i) Submit an annual watershed control program status report to the State. The annual watershed control program status report must describe the system's implementation of the approved plan and assess the adequacy of the plan to meet its goals. It must explain how the system is addressing any shortcomings in plan implementation, including those previously identified by the State or as the result of the watershed survey conducted under clause (ii). It must also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a system determines during implementation that making a significant change to its approved watershed control program is necessary, the system must notify the State prior to making any such changes. If any change is likely to reduce the level of source water protection, the system must also list in its notification the actions the system will take to mitigate this effect.

(ii) Undergo a watershed sanitary survey every three years for community water systems and every five years for noncommunity water systems and submit the survey report to the State. The survey must be conducted according to State guidelines and by persons the State approves. The

watershed sanitary survey must meet the following criteria: encompass the region identified in the State-approved watershed control plan as the area of influence; assess the implementation of actions to reduce source water Cryptosporidium levels; and identify any significant new sources of Cryptosporidium. If the State determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, systems must undergo another watershed sanitary survey by a date the State requires, which may be earlier than the regular date in this clause.

(iii) The system must make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The State may approve systems to withhold from the public portions of the annual status report, watershed control plan, and watershed sanitary survey based on water supply security considerations.

(F) If the State determines that a system is not carrying out the approved watershed control plan, the State may withdraw the watershed control program treatment credit.

(2) Alternative source.

(A) A system may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the State approves, a system may determine its bin classification under subsection (k) based on the alternative source monitoring results.

(B) If systems conduct alternative source monitoring under subparagraph (A), systems must also monitor their current plant intake concurrently as described in subsection (b).

(C) Alternative source monitoring under subparagraph (A) must meet the requirements for source monitoring to determine bin classification, as described in subsections (b) through (g). Systems must report the alternative source monitoring results to the State, along with supporting information documenting the operating conditions under which the samples were collected.

(D) If a system determines its bin classification under subsection (k) using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the system must relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in subsection (n).

(r) Pre-filtration treatment toolbox components.

(1) Presedimentation. Systems receive 0.5-log Cryptosporidium treatment credit for a presedimentation basin during any month the process meets the criteria in this paragraph.

(A) The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or GWUDI source.

(B) The system must continuously add a coagulant to the presedimentation basin.

(C) The presedimentation basin must achieve the performance criteria in clauses (i) or (ii).

(i) Demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction must be determined using daily turbidity measurements in the presedimentation process influent and effluent and must be calculated as follows: $\log_{10}$(monthly mean of daily

influent turbidity) - $\log_{10}$(monthly mean of daily effluent turbidity).

(ii) Complies with State-approved performance criteria that demonstrate at least 0.5-log mean removal of micron-sized particulate material through the presedimentation process.

(2) Two-stage lime softening. Systems receive an additional 0.5-log Cryptosporidium treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or GWUDI source.

(3) Bank filtration. Systems receive Cryptosporidium treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this paragraph. Systems using bank filtration when they begin source water monitoring under paragraph (b)(1) must collect samples as described in paragraph (d)(4) and are not eligible for this credit.

(A) Wells with a ground water flow path of at least 25 feet receive 0.5-log treatment credit; wells with a ground water flow path of at least 50 feet receive 1.0-log treatment credit. The ground water flow path must be determined as specified in subparagraph (D).

(B) Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A system must characterize the aquifer at the well site to determine aquifer properties. Systems must extract a core from the aquifer and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter constitute at least 10 percent of the core material.

(C) Only horizontal and vertical wells are eligible for treatment credit.

(D) For vertical wells, the ground water flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the ground water flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

(E) Systems must monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the system must report this result to the State and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the State determines that microbial removal has been compromised, the State may revoke treatment credit until the system implements corrective actions approved by the State to remediate the problem.

(F) Springs and infiltration galleries are not eligible for treatment credit under this section, but are eligible for credit under paragraph (s)(3).

(G) Bank filtration demonstration of performance. The State may approve Cryptosporidium treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this subparagraph. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in subparagraphs (A) through (E).

(i) The study must follow a State-approved protocol and must involve the collection of data on the removal of Cryptosporidium or a surrogate for Cryptosporidium and related hydrogeologic and water quality

parameters during the full range of operating conditions.

(ii) The study must include sampling both from the production well(s) and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well(s).

(s) Treatment performance toolbox components.

(1) Combined filter performance. Systems using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log Cryptosporidium treatment credit during any month the system meets the criteria in this paragraph. Combined filter effluent (CFE) turbidity must be less than or equal to 0.15 NTU in at least 95 percent of the measurements. Turbidity must be measured as described in paragraphs 11-20-46(d)(1) and (2).

(2) Individual filter performance. Systems using conventional filtration treatment or direct filtration treatment receive 0.5-log Cryptosporidium treatment credit, which can be in addition to the 0.5-log credit under paragraph (1), during any month the system meets the criteria in this paragraph. Compliance with these criteria must be based on individual filter turbidity monitoring as described in subsection 11-20-46.1(d), as applicable.

(A) The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

(B) No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

(C) Any system that has received treatment credit for individual filter performance and fails to meet the requirements of subparagraph (A) or (B) during any month does not receive a treatment technique violation under paragraph (1)(3) if the State determines the following:

(i) The failure was due to unusual and

short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

(ii) The system has experienced no more than two such failures in any calendar year.

(3) Demonstration of performance. The State may approve Cryptosporidium treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this paragraph. This treatment credit may be greater than or less than the prescribed treatment credits in subsection (l) or subsections (r) through (u) and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

(A) Systems cannot receive the prescribed treatment credit for any toolbox box option in subsections (r) through (u) if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this paragraph.

(B) The demonstration of performance study must follow a State-approved protocol and must demonstrate the level of Cryptosporidium reduction the treatment process will achieve under the full range of expected operating conditions for the system.

(C) Approval by the State must be in writing and may include monitoring and treatment performance criteria that the system must demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The State may designate such criteria where necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

(t) Additional filtration toolbox components.

(1) Bag and cartridge filters. Systems receive Cryptosporidium treatment credit of up to 2.0-log for individual bag or cartridge filters and up to 2.5-log for bag or cartridge filters operated in series by

meeting the criteria in subparagraphs (A) through (J). To be eligible for this credit, systems must report the results of challenge testing that meets the requirements of subparagraphs (B) through (I) to the State. The filters must treat the entire plant flow taken from a subpart H source.

(A) The Cryptosporidium treatment credit awarded to bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in subparagraphs (B) through (I). A factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing results to determine removal credit. Systems may use results from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria specified in subparagraphs (B) through (I).

(B) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of Cryptosporidium. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(C) Challenge testing must be conducted using Cryptosporidium or a surrogate that is removed no more efficiently than Cryptosporidium. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test; gross measurements such as turbidity may not be used.

(D) The maximum feed water concentration that can

be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

Maximum Feed Concentration = $1 \times 10^{4} \times$ (Filtrate Detection Limit)

(E) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(F) Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure drop, which establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this section.

(G) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$

Where:

LRV = log removal value demonstrated during challenge testing; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. In applying this equation, the same units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term C_p must be set equal to the detection limit.

(H) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the

terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRV_{filter}) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

(I) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest LRV_{filter} among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the 10th percentile of the set of LRV_{filter} values for the various filters tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

(J) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the State.

(2) Membrane filtration.

(A) Systems receive Cryptosporidium treatment credit for membrane filtration that meets the criteria of this paragraph. Membrane cartridge filters that meet the definition of membrane filtration in subsection 11-20-2 are eligible for this credit. The level of treatment credit a system receives is equal to the lower of the values determined under clauses (i) and (ii).

(i) The removal efficiency demonstrated during challenge testing conducted under the conditions in subparagraph (B).

(ii) The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in subparagraph (C).

(B) Challenge Testing. The membrane used by the system must undergo challenge testing to

evaluate removal efficiency, and the system must report the results of challenge testing to the State. Challenge testing must be conducted according to the criteria in clauses (i) through (vii). Systems may use data from challenge testing conducted prior to January 5, 2006 if the prior testing was consistent with the criteria in clauses (i) through (vii).

(i) Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system's treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

(ii) Challenge testing must be conducted using Cryptosporidium oocysts or a surrogate that is removed no more efficiently than Cryptosporidium oocysts. The organism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

(iii) The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

$$\text{Maximum Feed Concentration} = 3.16 \times 10^{6} \times (\text{Filtrate Detection Limit})$$

(iv) Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

(v) Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$$

Where:

LRV = log removal value demonstrated during the challenge test; C_f = the feed concentration measured during the challenge test; and C_p = the filtrate concentration measured during the challenge test. Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p is set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

(vi) The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value (LRVC-Test). If fewer than 20 modules are tested, then LRVC-Test

is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then LRVC-Test is equal to the 10th percentile of the representative LRVs among the modules tested. The percentile is defined by (i/(n+1)) where i is the rank of n individual data points ordered lowest to highest. If necessary, the 10th percentile may be calculated using linear interpolation.

(vii) The challenge test must establish a quality control release value (QCRV) for a non-destructive performance test that demonstrates the Cryptosporidium removal capability of the membrane filtration module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify Cryptosporidium removal capability. Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

(viii) If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the non-destructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of, and determine a new QCRV for, the modified membrane must be conducted and submitted to the State.

(C) Direct integrity testing. Systems must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded to the membrane filtration process and meets the requirements described in clauses (i) through (vi). A direct integrity test is defined as a

physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate).

(i) The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

(ii) The direct integrity method must have a resolution of 3 micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

(iii) The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded to the membrane filtration process by the State, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the approach in this clause as applicable to the type of direct integrity test the system uses. For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10} (Q_p / (VCF \times\times Q_{breach}))$$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test; Q_p = total design filtrate flow from the membrane unit; Q_{breach} = flow of water from an integrity breach associated with the

smallest integrity test response that can be reliably measured, and VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = LOG_{10}(C_f) - LOG_{10}(C_p)$$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test; C_f = the typical feed concentration of the marker used in the test; and C_p = the filtrate concentration of the marker from an integral membrane unit.

(iv) Systems must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the State.

(v) If the result of a direct integrity test exceeds the control limit established under clause (iv), the system must remove the membrane unit from service. Systems must conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

(vi) Systems must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day

that the membrane unit is in operation. The State may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for Cryptosporidium, or reliable process safeguards.

(D) Indirect integrity monitoring. Systems must conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in clauses (i) through (v). Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A system that implements continuous direct integrity testing of membrane units in accordance with the criteria in clauses (2)(C)(i) through (v) is not subject to the requirements for continuous indirect integrity monitoring. Systems must submit a monthly report to the State summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

(i) Unless the State approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

(ii) Continuous monitoring must be conducted at a frequency of no less than once every 15 minutes.

(iii) Continuous monitoring must be separately conducted on each membrane unit.

(iv) If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit as specified in clauses (2)(C)(i) through (v).

(v) If indirect integrity monitoring includes

a State-approved alternative parameter and if the alternative parameter exceeds a State-approved control limit for a period greater than 15 minutes, direct integrity testing must immediately be performed on the associated membrane units as specified in clauses (2)(C)(i) through (v).

(3) Second stage filtration. Systems receive 0.5-log Cryptosporidium treatment credit for a separate second stage of filtration that consists of sand, dual media, GAC, or other fine grain media following granular media filtration if the State approves. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or GWUDI source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The State must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

(4) Slow sand filtration (as secondary filter). Systems are eligible to receive 2.5-log Cryptosporidium treatment credit for a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or GWUDI source and no disinfectant residual is present in the influent water to the slow sand filtration process. The State must approve the treatment credit based on an assessment of the design characteristics of the filtration process. This paragraph does not apply to treatment credit awarded to slow sand filtration used as a primary filtration process.

(u) Inactivation toolbox components.

(1) Calculation of CT values.

(A) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Systems with treatment credit for chlorine dioxide or ozone under paragraph (2) or (3) must calculate CT at least once each day, with both

C and T measured during peak hourly flow as specified in 40 C.F.R. 141.74(a) through (b).

(B) Systems with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Under this approach, systems must add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.

(2) CT values for chlorine dioxide and ozone.

(A) Systems receive the Cryptosporidium treatment credit listed in the table referenced at 40 C.F.R. 141.720(b)(1) by meeting the corresponding chlorine dioxide CT value for the applicable water temperature, as described in paragraph (1).

(B) Systems receive the Cryptosporidium treatment credit listed in the table referenced at 40 C.F.R. 141.720(b)(2) by meeting the corresponding ozone CT values for the applicable water temperature, as described in paragraph (1).

(3) Site-specific study. The State may approve alternative chlorine dioxide or ozone CT values to those listed in paragraph (2) on a site-specific basis. The State must base this approval on a site-specific study a system conducts that follows a State-approved protocol.

(4) Ultraviolet light. Systems receive Cryptosporidium, Giardia lamblia, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in subparagraph (A). Systems must validate and monitor UV reactors as described in subparagraphs (B) and (C) to demonstrate that they are achieving a particular UV dose value for treatment credit.

(A) UV dose table. The treatment credits listed in the table referenced at 40 C.F.R. 141.720(d)(1) are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp.

To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing, as described in subparagraph (B). The UV dose values in this table are applicable only to post-filter applications of UV in filtered systems and to unfiltered systems.

(B) Reactor validation testing. Systems must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in subparagraph (A) (i.e., validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

(i) When determining validated operating conditions, systems must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.

(ii) Validation testing must include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

(iii) The State may approve an alternative approach to validation testing.

(C) Reactor monitoring.

(i) Systems must monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under subparagraph (B). This monitoring must include UV intensity as measured by a UV sensor, flow rate, lamp status, and other parameters the State

designates based on UV reactor operation. Systems must verify the calibration of UV sensors and must recalibrate sensors in accordance with a protocol the State approves.

(ii) To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose, as described in subparagraphs (A) and (B). Systems must demonstrate compliance with this condition by the monitoring required under clause (C)(i).

(v) Reporting requirements.

(1) Systems must report sampling schedules under subsection (c) and source water monitoring results under subsection (g) unless they notify the State that they will not conduct source water monitoring due to meeting the criteria of paragraph (b)(4).

(2) Systems must report the use of uncovered finished water storage facilities to the State as described in subsection (o).

(3) Filtered systems must report their Cryptosporidium bin classification as described in subsection (k).

(4) Unfiltered systems must report their mean source water Cryptosporidium level as described in subsection (m).

(5) Systems must report disinfection profiles and benchmarks to the State as described in subsection (i) through (j) prior to making a significant change in disinfection practice.

(6) Systems must report to the State in accordance with the table referenced at 40 C.F.R. 141.721(f) for any microbial toolbox options used to comply with treatment requirements under subsection (l) or (m). Alternatively, the State may approve a system to certify operation within required parameters for treatment credit rather than reporting monthly operational data for toolbox options.

(w) Recordkeeping requirements.

(1) Systems must keep results from the initial round of

source water monitoring under paragraph (b)(1) and the second round of source water monitoring under paragraph (b)(2) until 3 years after bin classification under subsection (k) for filtered systems or determination of the mean Cryptosporidium level under subsection (k) for unfiltered systems for the particular round of monitoring.

(2) Systems must keep any notification to the State that they will not conduct source water monitoring due to meeting the criteria of paragraph (b)(4) for 3 years.

(3) Systems must keep the results of treatment monitoring associated with microbial toolbox options under subsection (q) through (u) and with uncovered finished water reservoirs under subsection (o), as applicable, for 3 years.

(x) Requirements to respond to significant deficiencies identified in sanitary surveys performed by EPA.

(1) A sanitary survey is an onsite review of the water source (identifying sources of contamination by using results of source water assessments where available), facilities, equipment, operation, maintenance, and monitoring compliance of a PWS to evaluate the adequacy of the PWS, its sources and operations, and the distribution of safe drinking water.

(2) For the purposes of this section, a significant deficiency includes a defect in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that EPA determines to be causing, or has the potential for causing the introduction of contamination into the water delivered to consumers.

(3) For sanitary surveys performed by EPA, systems must respond in writing to significant deficiencies identified in sanitary survey reports no later than 45 days after receipt of the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey.

(4) Systems must correct significant deficiencies identified in sanitary survey reports according to the schedule approved by EPA, or if there is no approved schedule, according to the schedule

reported under paragraph (3) if such deficiencies are within the control of the system. [Eff and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2,340E-9; 42 U.S.C. §§300f, 300g-1, 300g-2, 300g-3, 300g-4, 300g-5, 300g-6, 300j-4, 300j-9, 300j-11; 40 C.F.R. §141.700 through §141.723)

§11-20-47 Treatment techniques for acrylamide and epichlorohydrin. Each public water system must certify annually in writing to the director (using third party or manufacturer's certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide	=	0.05 per cent dosed at 1 ppm (or equivalent);
Epichlorohydrin	=	0.01 per cent dosed at 20 ppm (or equivalent).

Certifications can rely on manufacturers or third parties, as approved by the director. [Eff and comp 1/2/93; am and comp 12/15/94; comp 10/13/97; comp 9/7/99; comp 11/30/02; comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141 and 142, §§141.111)

§11-20-48 Adoption of the national primary drinking water regulations for lead and copper. The national primary drinking water regulations for lead and copper, adopted under the Safe Drinking Water Act, and appearing at 40 C.F.R. Part 141, Subpart I, §§141.80, 141.81, 141.82, 141.83, 141.84, 141.85, 141.86, 141.87, 141.88, 141.89, 141.90, and 141.91 are made a part of this chapter. For this chapter, "State" as used in these federal regulations means "state" or "director" as used in this chapter. [Eff and comp 12/15/94; am and comp 10/13/97; am and comp 9/7/99; am and comp 11/30/02; comp 12/16/05; am and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40

C.F.R. Parts 141 and 142, §§141.80, 141.81, 141.82, 141.83, 141.84, 141.85, 141.86, 141.87, 141.88, 141.89, 141.90, and 141.91)

§11-20-48.5 Consumer confidence reports. (a) The national primary drinking water regulations for consumer confidence reports, adopted under the Safe Drinking Water Act, and appearing at 40 C.F.R. Part 141, Subpart O, §§141.151(a)-(d), (f), 141.152(b)-(d), 141.153, 141.154, and 141.155(a)-(f), (h), are made a part of this chapter. For this chapter, "State" as used in these federal regulations means "state" or "director" as used in this chapter.

(b) In accordance with 40 C.F.R. §141.155(g), the governor may waive the mailing requirement of 40 C.F.R. §141.155(a), and if the governor does so, the requirements of 40 C.F.R. §141.155(g)(1) or (2) apply as appropriate. [Eff and comp 9/7/99; am and comp 11/30/02; am and comp 12/16/05; comp NOV 28 2011] (Auth: HRS §§340E-6, 340E-9) (Imp: HRS §§340E-6, 340E-9; 42 U.S.C. §§300g-3(c)(4); 40 C.F.R. Part 141, §§141.151, 141.152, 141.153, 141.154, and 141.155)

§11-20-49 REPEALED [R NOV 28 2011]

§11-20-50 to §11-20-99 (Reserved)

§11-20-100 Severability clause. If any provision of this chapter, or the application thereof to any person or circumstance, is held invalid, the invalidity does not affect other provisions of applications of this chapter which can be given effect without the invalid provision or application, and to this end the provisions of this chapter are severable." [Eff and comp NOV 28 2011] (Auth: HRS §§340E-2, 340E-9) (Imp: HRS §§340E-2, 340E-9; 42 U.S.C. §§300g-1, 300g-2; 40 C.F.R. Parts 141, 142, §142.10)

Amendments to and compilation of chapter 20 title 11, Hawaii Administrative Rules, on the Summary Page dated September 20, 2011 were adopted on SEP 20 2011 following a public hearing held on November 17, 2010, after public notice was given statewide in the Honolulu Star Advertiser, Maui News, Hawaii Tribune-Herald, West Hawaii Today and The Garden Island on October 14, 2010.

The rules shall take effect ten days after filing with the Office of the Lieutenant Governor.

LORETTA J. FUDDY, A.C.S.W., M.P.H.
Director of Health

NEIL ABERCROMBIE
Governor
State of Hawaii

Dated: 11-10-11

Filed

'11 NOV 17 A7:1

LIEUTENANT GOVERNOR'S OFFICE

APPROVED AS TO FORM:

Deputy Attorney General

20-289

APPENDIX A

STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
National Primary Drinking Water Regulations (NPDWR) A. Microbiological Contaminants			
1a. Total Coliform	Zero	See footnote[3]	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful, bacteria may be present. Coliforms were found in more samples than allowed and this was a warning of potential problems.
1b. Fecal Coliform/E. coli	Zero	Zero	Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems
2a. Turbidity (MCL)[4]	None	1 NTU[5]/5 NTU	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

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APPENDIX A
STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
2b. Turbidity (SWTR TT)[6]	None	TT[7]	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
2c. Turbidity (IESWTR TT and LT1ESWTR)[8]	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

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APPENDIX A
STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
B. Surface Water Treatment Rule (SWTR), Interim Enhanced Surface Water Treatment Rule (IESWTR) and Filter Backwash Recycling Rule (FBRR) violations			
3. Giardia Lamblia (SWTR/IESWTR/LT1ESWTR) 4. Viruses (SWTR/IESWTR/LT1ESWTR) 5. Heterotrophic plate count (HPC) bacteria[9] (SWTR/IESWTR/LT1ESWTR) 6. Legionella (SWTR/IESWTR/LT1ESWTR) 7. Cryptosporidium (IESWTR/FBRR/LT1ESWTR)	Zero	TT[10]	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
C. Inorganic Chemicals (IOCs)			
8. Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
9. Arsenic[11]	None	0.010	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
10. Asbestos (10μm)	7 MFL[12]	7 MFL	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
11. Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
12. Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
13. Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
14. Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
15. Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
16. Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
17. Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
18. Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
19. Nitrite	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
			Infants below the age of six months who

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
20. Total Nitrate and Nitrite	10	10	drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
21. Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
22. Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.

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STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
D. Lead and Copper Rule			
23. Lead	Zero	TT[13]	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
24. Copper	1.3	TT[14]	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
E. Synthetic Organic Chemicals (SOCs)			
25. 2,4-D	0.07	0.07	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
26. 2,4,5-TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
27. Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
28. Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
29. Benzo(a)pyrene (PAHs)	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
30. Carbofuran	0.04	0.04	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
31. Chlordane	Zero	0.002	Some people who drink water containing

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
32. Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
33. Di (2-ethylhexyl) adipate	0.4	0.4	Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience general toxic effects or reproductive difficulties.
34. Di (2-ethylhexyl) phthalate	Zero	0.006	Some people who drink water containing di (2-ethylhexyl) phthalate in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
35. Dibromochloropropane (DBCP)	Zero	0.00004	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
36. Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
37. Dioxin	Zero	3×10^{-8}	Some people who drink water containing

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STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
(2,3,7,8-TCDD)			dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
38. Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
39. Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
40. Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
41. Ethylene dibromide	Zero	0.00004	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
42. Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
43. Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
44. Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL

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STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION (MAY 4, 2000)

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			over many years could experience liver damage, and may have an increased risk of getting cancer.
45. Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
46. Hexachlorocyclo -pentadiene	0.05	0.05	Some people who drink water containing hexachlorocyclo-pentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
47. Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
48. Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
49. Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
50. Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
51. Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
52. Polychlorinated biphenyls (PCBs)	Zero	0.0005	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
53. Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
54. Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, and may have an increased risk of getting cancer.
55. 1,2,3-Trichloro propane		0.0006	Some people who drink water containing TCP in excess of the MCL over many years could experience problems with their nervous system, respiratory system, reproductive system, liver and may have an increased risk of getting cancer.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
F. Volatile Organic Chemicals (VOCs)			
56. Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
57. Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
58. Chlorobenzene (monochloro-benzene)	0.1	0.1	Some people who drink water containing Chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
59. *o*-Dichlorobenzene	0.6	0.6	Some people who drink water containing *o*-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
60. *p*-Dichlorobenzene	0.075	0.075	Some people who drink water containing *p*-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
61. 1,2-Dichloroethane	Zero	0.005	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
62. 1,1-Dichloro ethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
63. *cis*-1,2-Dichloro ethylene	0.07	0.07	Some people who drink water containing *cis*-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
64. *trans*-1,2-Dichloro ethylene	0.1	0.1	Some people who drink water containing *trans*-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
65. Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
66. 1,2-Dichloro propane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
67. Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
68. Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
69. Tetrachloro ethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			their liver, and may have an increased risk of getting cancer.
70. Toluene	1	1	Some people who drink water containing toluene in excess of the MCL over many years could have problems with their nervous system, kidneys or liver.
71. 1,2,4-Trichloro benzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
72. 1,1,1-Trichloro ethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
73. 1,1,2-Trichloro ethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
74. Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
75. Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
76. Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
G. Radioactive Contaminants			
77. Beta/photon emitters	Zero	4 mrem/yr[15]	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.
78. Alpha emitters	Zero	15 pCi/L[16]	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
79. Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
80. Uranium[17]	Zero	30 µg/L	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
H. Disinfection Byproducts (DBPs), Byproduct Precursors, and Disifectant Residuals: Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs)[18]			
81. Total trihalomethanes (TTHMs)	N/A	0.080[19, 20]	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
82. Haloacetic Acids (HAA)	N/A	0.060[21]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
83. Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
84. Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
85. Chlorine	4 (MRDLG)[22]	4.0 (MRDL)[23]	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink

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Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
86. Chloramines	4 (MRDLG)	4.0 (MRDL)	water containing chlorine well in excess of the MRDL could experience stomach discomfort. Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
87a. Chlorine dioxide, where any 2 consecutive daily samples taken at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* the chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
87b. Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. *Add for public notification only:* The chlorine dioxide violations reported today include exceedances of the EPA standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure
88. Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system

Contaminant	MCLG[1] mg/L	MCL[2] mg/L	Standard Health Effects Language for Public Notification
			effects, and may lead to an increased risk of getting cancer.
I. Other Treatment Techniques			
89. Acrylamide	Zero	TT	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
90. Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.

Footnotes to Appendix A

1. MCLG - Maximum contaminant level goal.
2. MCL - Maximum contaminant level.
3. For water systems analyzing at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. For systems analyzing fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.
4. There are various regulations that set turbidity standards for different types of systems, including 40 C.F.R. 141.13, and the 1989 Surface Treatment Rule, the 1998 Interim Enhanced Surface Water Treatment Rule and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule. The MCL for the monthly turbidity average is 1 NTU; the MCL for the 2-day average is 5 NTU for systems that are required to filter but have not yet installed filtration (40 C.F.R. 141.13).
5. NTU - Nephelometric turbidity unit.
6. There are various regulations that set turbidity standards for different types of systems, including 40 C.F.R. 141.13, the 1989 Surface Water Treatment Rule, the 1998 Interim Enhanced Surface Water Treatment Rule, and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule. Systems subject to the Surface Water Treatment Rule (both filtered and unfiltered) may not exceed 5 NTU. In addition,

in filtered systems, 95 percent of samples each month must not exceed 0.5 NTU in systems using conventional or direct filtration and must not exceed 1 NTU in systems using slow sand or diatomaceous earth filtration or other filtration technologies approved by the state.

7. TT - Treatment technique.
8. There are various regulations that set turbidity standards for different types of systems, including 40 C.F.R. 141.13, the 1989 Surface Water Treatment Rule (SWTR), the 1998 Interim Enhanced Surface Water Treatment Rule (IESWTR), and the 2002 Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR). For systems subject to the IESWTR (systems serving at least 10,000 people, using surface water or ground water under the direct influence of surface water), that use conventional filtration or direct filtration, after January 1, 2002, the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of monthly measurements, and the turbidity level of a systems's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the IESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the state. For systems subject to the LT1ESWTR (systems serving fewer than 10,000 people, using surface water or ground water under the direct influence of surface water) that use conventional filtration or direct filtration, after January 14, 2005 the turbidity level of a system's combined filter effluent may not exceed 0.3 NTU in at least 95 percent of the monthly measurements, and the turbidity level of a system's combined filter effluent must not exceed 1 NTU at any time. Systems subject to the LT1ESWTR using technologies other than conventional, direct, slow sand, or diatomaceous earth filtration must meet turbidity limits set by the State.
9. The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfectant in the distribution system.
10. SWTR, IESWTR, and LT1ESWTR treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.
11. These arsenic values are effective January 23, 2006. Until then, the MCL is 0.05 mg/L and there is no MCLG
12. Millions fibers per liter.
13. Action Level = 0.015 mg/L.
14. Action Level = 1.3 mg/L.
15. Millirems per years.
16. Picocuries per liter.
17. The uranium MCL is effective December 8, 2003 for all community water systems.
18. Surface water systems and ground water systems under the direct influence of surface water are regulated under Subpart H of 40 C.F.R. 141. Subpart H community and non-transient non-community systems serving $\geq$ 10,000 must comply with section 11-20-45.1 DBP MCLs and disinfectant maximum residual disinfectant levels (MRDLs) beginning January 1, 2002. All other community and

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non-transient non-community systems must comply with section 11-20-45.1 DBP MCLs and disinfectant MRDLs beginning January 1, 2004. Subpart H transient non-community systems serving 10,000 or more persons that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Subpart H transient non-community systems serving fewer than 10,000 persons and systems using only ground water not under the direct influence of surface water that use chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.

19. Community and non-transient non-community systems must comply with Stage 2 Disinfection Byproduct TTHM and HAA5 MCLs of 0.080 mg/L and 0.060 mg/L, respectively (with compliance calculated as a locational running annual average) on the schedule in paragraph 11-20-45.3(a)(3).
20. The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.
21. The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.
22. MRDLG - Maximum residual disinfectant level goal.
23. MRDL - Maximum residual disinfectant level.

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APPENDIX B

ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (HAR §11-20-45.1(c)(2)(A))

Type of System	Minimum Monitoring Frequency	Sample Location in the distribution system
Subpart H system serving at least 10,000 persons.	Four water samples per quarter per treatment plant.	At least 25 per-cent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods[1].
Subpart H system serving from 500 to 9,999 persons.	One water sample per quarter per treatment plant.	Locations representing maximum residence time[1].

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ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (HAR §11-20-45.1(c)(2)(A))

Type of System	Minimum Monitoring Frequency	Sample Location in the distribution system
Subpart H system serving fewer than 500 persons.	One sample per year per treatment plant during month of warmest water temperature.	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in HAR §11-20-45.1(c)(2)(A)(iv).
System using only ground water not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	One water sample per quarter per treatment plant[2].	Locations representing maximum residence time[1].

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ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5 (HAR §11-20-45.1(c)(2)(A))

Type of System	Minimum Monitoring Frequency	Sample Location in the distribution system
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	One sample per year per treatment plant[2] during month of warmest water temperature	Locations representing maximum residence time[1]. If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets criteria in HAR §11-20-45.1(c)(2)(A)(iv).

[1]If a system elects to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

[2]Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with State approval in accordance with criteria developed under HAR §11-20-45.1(c)(1)(B).

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APPENDIX C

REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5 (HAR §11-20-45.1(c)(2)(A))

If you are a...	You may reduce monitoring if you have monitored at least one year and your...	To this level
Subpart H system serving at least 10,000 persons which has a source water annual average TOC level, before any treatment, of <4.0 mg/L.	TTHM annual average <0.040 mg/L and HAA5 annual average <0.030 mg/L.	One sample per treatment plant per quarter at distribution system location reflecting maximum residence time.
Subpart H system serving from 500 to 9,999 persons which has a source water annual average TOC level, before any treatment, of <4.0 mg/L.	TTHM annual average <0.040 mg/L and HAA5 annual average <0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. NOTE: Any Subpart H system serving fewer than 500 persons may not reduce its monitoring to less than one sample per treatment plant per year.

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APPENDIX C

REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5 (HAR §11-20-45.1(c)(2)(A))

If you are a...	You may reduce monitoring if you have monitored at least one year and your...	To this level
System using only groundwater not under direct influence of surface water using chemical disinfectant and serving at least 10,000 persons.	TTHM annual average <0.040 mg/L and HAA5 annual average <0.030 mg/L.	One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature.
System using only ground water not under direct influence of surface water using chemical disinfectant and serving fewer than 10,000 persons.	TTHM annual average <0.040 mg/L and HAA5 annual average <0.030 mg/L for two consecutive years OR TTHM annual average <0.020 mg/L and HAA5 annual average <0.015 mg/L for one year.	One sample per treatment plant per three year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring.

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APPENDIX D

REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCTS (HAR §11-20-45.1(e)(2))

If you are a ...	You must report...[1]
1. System monitoring for TTHM and HAA5 under the requirements of §11-20-45.1(c)(2) on a quarterly or more frequent basis.	I. The number of samples taken during the last quarter. II. The location, date and result of each sample taken during the last quarter. III. The arithmetic average of all samples taken in the last quarter. IV. The annual arithmetic average of the quarterly arithmetic averages of this section for the last four quarters. V. Whether, based on HAR §11-20-45.1(d)(2)(A), the MCL was violated.
2. System monitoring for TTHM and HAA5 under the requirements of §11-20-45.1(c)(2) less frequently than quarterly (but at least annually).	I. The number of samples taken during the last year. II. The location, date and result of each sample taken during the last monitoring period. III. The arithmetic average of all samples taken over the last year. IV. Whether, based on HAR §11-20-45.1(d)(2)(A), the MCL was exceeded.

APPENDIX D

REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCTS (HAR §11-20-45.1(e)(2))

3. System monitoring for TTHM and HAA5 under the requirements of §11-20-45.1(c)(2) less frequently than annually.	I. The location, date and result of the last sample taken. II. Whether, based on HAR §11-20-45.1(d)(2)(A), the MCL was violated.
4. System monitoring for chlorite under the requirements of §11-20-45.1(c)(2).	I. The number of entry point samples taken each month for the last 3 months. II. The location, date and result of each sample (both entry point and distribution system) taken during the last quarter. III. For each month in the reporting period, the arithmetic average of all samples taken in each 3-samples set taken in the distribution system. IV. Whether, based on HAR §11-20-45.1(d)(2)(C), the MCL was violated, and how many times it was violated each month.

APPENDIX D

REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCTS (HAR §11-20-45.1(e)(2))

5. System monitoring for bromate under the requirements of §11-20-45.1(c)(2).	I. The number of samples taken during the last quarter. II. The location, date and result of each sample taken during the last quarter. III. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. IV. Whether, based on HAR §11-20-45.1(d)(2)(B) the MCL was violated.

[1]The State may choose to perform calculations and determine whether the MCL was exceeded, in lieu of having the system report that information.

APPENDIX E

REPORTING REQUIREMENTS FOR DISINFECTANT RESIDUALS (HAR §11-20-45.1(e)(3))

If you are a ...	You must report...[1]
1. System monitoring for chlorine or chloramines under the requirements of §11-20-45.1(c)(3).	I. The number of samples taken during each month of the last quarter. II. The monthly arithmetic average of all samples taken in each month for the last 12 months. III. The arithmetic average of the monthly averages for the last 12 months. IV. Whether, based on §11-20-45.1(d)(3)(A), the MRDL was violated.
2. System monitoring for chlorine dioxide under the requirements of §11-20-45.1(c)(3).	I. The dates, result, and locations of samples taken during the last quarter. II. Whether, based on §11-20-45.1(d)(3)(B), the MRDL was violated. III. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute.

[1]The State may choose to perform calculations and determine whether the MRDL was exceeded, in lieu of having the system report that information.

APPENDIX F
REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCT PRECURSORS AND ENHANCED COAGULATION OR ENHANCED SOFTENING (HAR §11-20-45.1(e)(4))

If you are a ...	You must report...[1]
1. System monitoring monthly or quarterly for TOC under the requirements of §11-20-45.1(c)(4) and required to meet the enhanced coagulation or enhanced softening requirements in §11-20-45.1(f)(2)(B) or (C).	I. The number of paired (source water and treated water) samples taken during the last quarter. II. The location, date and results of each paired sample and associated alkalinity taken during the last quarter. III. For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. IV. Calculations for determining compliance with the TOC percent removal requirements, as provided in §11-20-45.1(f)(3)(A). V. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in §11-20-45.1(f)(2) for the last four quarters.

APPENDIX F
REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCT PRECURSORS AND ENHANCED COAGULATION OR ENHANCED SOFTENING (HAR §11-20-45.1(e)(4))

2. System monitoring monthly or quarterly for TOC under the requirements of §11-20-45.1(c)(4) and meeting one or more of the alternative compliance criteria in §11-20-45.1(f)(1)(B) or (C).	I. The alternative compliance criterion that the system is using. II. The number of paired samples taken during the last quarter. III. The location, date and result of each paired sample and associated alkalinity taken during the last quarter. IV. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in §11-20-45.1(f)(1)(B)(i) or (iii) or of treated water TOC for systems meeting the criterion in §11-20-45.1(f)(1)(B)(ii). V. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in §11-20-45.1(f)(1)(B)(v) or of treated water SUVA for systems meeting the criterion in §11-20-45.1(f)(1)(B)(vi).

APPENDIX F
REPORTING REQUIREMENTS FOR DISINFECTION BYPRODUCT PRECURSORS AND ENHANCED COAGULATION OR ENHANCED SOFTENING (HAR §11-20-45.1(e)(4))

	VI. The running annual average of source water alkalinity for systems meeting the criterion in §11-20-45.1(f)(1)(B)(iii) and of treated water alkalinity for systems meeting the criterion in §11-20-45.1(f)(1)(C)(i). VII. The running annual average for both TTHM and HAA5 for systems meeting the criterion in §11-20-45.1(f)(1)(B)(iii) or (iv). VIII. The running annual average of the amount of magnesium hardness removal (as $CaCo_3$ in mg/L) for systems meeting the criterion in §11-20-45.1(f)(1)(C)(ii). IX. Whether the system is in compliance with the particular alternative compliance criterion in §11-20-45.1(f)(1)(B) or (C).

[1]The State may choose to perform calculations and determine whether the treatment technique was met, in lieu of having the system report that information.

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
I. Violations of National Primary Drinking Water Regulations (NPDWR)[3]				
A. Microbiological Contaminants				
1. Total coliform	2	141.63(a)	3	141.21 (a)-(e)
2. Fecal coliform/ E. coli	1	141.63(b)	[4]1, 3	141.21(e)
3. Turbidity MCL	2	141.13(a)	3	141.22
4. Turbidity MCL (average of 2 days' samples >5NTU	[5]2, 1	141.13(b)	3	141.22
5. Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	[6]2, 1	141.71(a)(2), 141.71(c)(2)(i), 141.73(a)(2), 141.73(b)(2), 141.73(c)(2), 141.73(d), 141.173(a)(2), 141.173(b) 141.551(b)	3	141.74(a)(1), 141.74(b)(2), 141.74(c)(1), 141.174 141.560(a)-(c) 141.561

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
6. Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. allowable turbidity level (TT)	2	141.70-141.73	3	141.74
7. Interim Enhanced Surface Water Treatment Rule violations, other than violations resulting from single exceedance of max. turbidity level (TT)	2	[7]141.170-141.173 141.500-141.553	3	141.172, 141.174 141.530-141.544 141.560-141.564
8. Filter Backwash Recycling Rule violations	2	141.76(c)	3	141.76(b),(d)
9. Long Term 1 Enhanced Surface Water Treatment Rule violations	2	141.500-141.553	3	141.530-141.544, 141.560-141.564

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
10. LT2ESWTR violations	2	141.710-141.720	[22]2,3	141.701-141.705 and 141.708-141.709
B. Inorganic Chemicals (IOC's)				
1. Antimony	2	141.62(b)	3	141.23(a), (c)
2. Arsenic	2	[8]141.11(b)	3	[9]141.23(a), (c)
3. Asbestos (fibers >10 μm)	2	141.62(b)	3	141.23(a)-(b)
4. Barium	2	141.62(b)	3	141.23(a), (c)
5. Beryllium	2	141.62(b)	3	141.23(a), (c)
6. Cadmium	2	141.62(b)	3	141.23(a), (c)
7. Chromium (total)	2	141.62(b)	3	141.23(a), (c)
8. Cyanide	2	141.62(b)	3	141.23(a), (c)
9. Fluoride	2	141.62(b)	3	141.23(a), (c)
10. Mercury (inorganic)	2	141.62(b)	3	141.23(a), (c)
11. Nitrate	1	141.62(b)	[10]1, 3	141.23(a), (d), 141.23(f)(2)
12. Nitrite	1	141.62(b)	[10]1, 3	141.23(a), (e), 141.23(f)(2)
13. Total Nitrate and Nitrite	1	141.62(b)	3	141.23(a)
14. Selenium	2	141.62(b)	3	141.23(a), (c)
15. Thallium	2	141.62(b)	3	141.23(a), (c)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
C. Lead and Copper Rule (Action Level for lead is 0.015 mg/L, for copper is 1.3 mg/L)				
1. Lead and Copper Rule (TT)	2	141.80-141.85	3	141.86-141.89
D. Synthetic Organic Chemicals (SOCs)				
1. 2,4-D	2	141.61(c)	3	141.24(h)
2. 2,4,5-TP (Silvex)	2	141.61(c)	3	141.24(h)
3. Alachlor	2	141.61(c)	3	141.24(h)
4. Atrazine	2	141.61(c)	3	141.24(h)
5. Benzo(a)pyrene (PAHs)	2	141.61(c)	3	141.24(h)
6. Carbofuran	2	141.61(c)	3	141.24(h)
7. Chlordane	2	141.61(c)	3	141.24(h)
8. Dalapon	2	141.61(c)	3	141.24(h)
9. Di (2-ethylhexyl) adipate	2	141.61(c)	3	141.24(h)
10. Di (2-ethylhexyl) phthalate	2	141.61(c)	3	141.24(h)
11. Dibromochloropropane	2	141.61(c)	3	141.24(h)
12. Dinoseb	2	141.61(c)	3	141.24(h)
13. Dioxin (2,3,7,8-TCDD)	2	141.61(c)	3	141.24(h)
14. Diquat	2	141.61(c)	3	141.24(h)
15. Endothall	2	141.61(c)	3	141.24(h)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
16. Endrin	2	141.61(c)	3	141.24(h)
17. Ethylene dibromide	2	141.61(c)	3	141.24(h)
18. Glyphosate	2	141.61(c)	3	141.24(h)
19. Heptachlor	2	141.61(c)	3	141.24(h)
20. Heptachlor epoxide	2	141.61(c)	3	141.24(h)
21. Hexachlorobenzene	2	141.61(c)	3	141.24(h)
22. Hexachlorocyclo-pentadiene	2	141.61(c)	3	141.24(h)
23. Lindane	2	141.61(c)	3	141.24(h)
24. Methoxychlor	2	141.61(c)	3	141.24(h)
25. Oxamyl (Vydate)	2	141.61(c)	3	141.24(h)
26. Pentachlorophenol	2	141.61(c)	3	141.24(h)
27. Picloram	2	141.61(c)	3	141.24(h)
28. Polychlorinated biphenyls (PCBs)	2	141.61(c)	3	141.24(h)
29. Simazine	2	141.61(c)	3	141.24(h)
30. Toxaphene	2	141.61(c)	3	141.24(h)
31. 1,2,3-Trichloropropane	2	11-20-4(d)	3	11-20-12(e)
E. Volatile Organic Chemicals (VOCs)				
1. Benzene	2	141.61(a)	3	141.24(f)
2. Carbon tetrachloride	2	141.61(a)	3	141.24(f)
3. Chlorobenzene (monochlorobenzene)	2	141.61(a)	3	141.24(f)
4. o-Dichlorobenzene	2	141.61(a)	3	141.24(f)
5. p-Dichlorobenzene	2	141.61(a)	3	141.24(f)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
6. 1,2-Dichloroethane	2	141.61(a)	3	141.24(f)
7. 1,1-Dichloroethylene	2	141.61(a)	3	141.24(f)
8. cis-1,2-Dichloroethylene	2	141.61(a)	3	141.24(f)
9. trans-1,2-Dichloroethylene	2	141.61(a)	3	141.24(f)
10. Dichloromethane	2	141.61(a)	3	141.24(f)
11. 1,2-Dichloropropane	2	141.61(a)	3	141.24(f)
12. Ethylbenzene	2	141.61(a)	3	141.24(f)
13. Styrene	2	141.61(a)	3	141.24(f)
14. Tetrachloroethylene	2	141.61(a)	3	141.24(f)
15. Toluene	2	141.61(a)	3	141.24(f)
16. 1,2,4-Trichlorobenzene	2	141.61(a)	3	141.24(f)
17. 1,1,1-Trichloroethane	2	141.61(a)	3	141.24(f)
18. 1,1,2-Trichloroethane	2	141.61(a)	3	141.24(f)
19. Trichloroethylene	2	141.61(a)	3	141.24(f)
20. Vinyl chloride	2	141.61(a)	3	141.24(f)
21. Xylenes (total)	2	141.61(a)	3	141.24(f)
F. Radioactive Contaminants				
1. Beta/photon emitters	2	141.66(d)	3	141.25(a), 141.26(b)
2. Alpha emitters	2	141.66(c)	3	141.25(a), 141.26(a)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
3. Combined radium (226 & 228)	2	141.66(b)	3	141.25(a), 141.26(a)
4. Uranium	[11]2	141.66(e)	[12]3	141.25(a), 141.26(a)
G. Disinfection Byproducts (DBPs), Byproduct Precursors, Disinfectant Residuals. Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). EPA sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).[13]				
1. Total trihalomethanes (TTHMs)	2	[14]141.64(b)	3	141.600-141.605, 141.620-141.629 141.132(a)-(b)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
2. Haloacetic Acids (HAA5)	2	141.64(b)	3	141.600-141.605, 141.620-141.629 141.132(a)-(b)
3. Bromate	2	141.64(a)	3	141.132(a)-(b)
4. Chlorite	2	141.64(a)	3	141.132(a)-(b)
5. Chlorine (MRDL)	2	141.65(a)	3	141.132.(a)-(c)
6. Chloramine (MRDL)	2	141.65(a)	3	141.132(a)-(c)
7. Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	141.65(a) 141.133(c)(3)	[15]2, 3	141.132(a), (c), 141.133(c)(2)
8. Chlorine dioxide (MRDL), where samples(s) in distribution system the next day are also above MRDL	[16]1	141.65(a), 141.133(c)(3)	1	141.132(a), (c), 141.133(c)(2)
9. Control of DBP precursors- TOC (TT)	2	141.135(a)-(b)	3	141.132(a), (d)

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
10. Bench marking and disinfection profiling	N/A	N/A	3	141.172 141.530-141.544
11. Development of monitoring plan	N/A	N/A	3	141.132(f)
H. Other Treatment Techniques				
1. Acrylamide (TT)	2	141.111	N/A	N/A
2. Epichlorohydrin (TT)	2	141.111	N/A	N/A
II. Unregulated Contaminant Monitoring[17]:				
A. Unregulated contaminants	N/A	N/A	3	141.40
B. Nickel	N/A	N/A	3	141.23(c), (k)
III. Public Notification for Variances and Exemptions:				
A. Operation under a variance or exemption	3	[18]1415, 1416	N/A	N/A
B. Violation of conditions of a variance or exemption	2	1415, 1416, [19]142.307	N/A	N/A
IV. Other Situations Requiring Public Notification:				
A. Fluoride secondary maximum contaminant level (SMCL) exceedance	3	143.3	N/A	N/A

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NPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE (MAY 4, 2000)[1]

Contaminant	MCL/MRDL/TT Violations[2]		Monitoring & Testing Procedure Violations	
	Tier of Public Notice Required	Citation	Tier of Public Notice Required	Citation
B. Exceedance of nitrate MCL for non-community systems, as allowed by State	1	141.11(d)	N/A	N/A
C. Availability of unregulated contaminant monitoring data	3	141.40	N/A	N/A
D. Waterborne disease outbreak	1	141.2, 141.71(c)(2)(ii)	N/A	N/A
E. Other waterborne emergency[20]	1	N/A	N/A	N/A
F. Other situations as determined by the State	[21]1, 2, 3	N/A	N/A	N/A

APPENDIX G - FOOTNOTES

1. Violations and other situations not listed in this table (e.g. failure to prepare Consumer Confidence Reports), do not require notice, unless otherwise determined by the state. States may, at their option, also require a more stringent public notice tier (e.g. Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations listed in this Appendix, as authorized under § 141.202(a) and §141.203(a).
2. MCL-Maximum contaminant level, MRDL-Maximum residual disinfectant level, TT-Treatment technique. The term Violations of National Primary Drinking Water Regulations (NPDWR) is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.
3. Failure to test for fecal coliform or E. coli is a Tier 1 violation if testing is not done after any repeat sample tests positive for coliform. All other total coliform monitoring and testing procedure violations are Tier 3.
4. Systems that violate the turbidity MCL of 5 NTU based on an average of measurements over two consecutive days must consult with the state within 24 hours after learning of the violation. Based on this consultation, the state may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the state in the 24-hour period, the violation is automatically elevated to Tier 1.
5. Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment rule (IESWTR) or the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) are required to consult with the state within 24 hours after learning of the violation. Based on this consultation, the state may subsequently decide to elevate the violation to Tier 1. If a system is unable to make contact with the state in the 24-hour period, the violation is automatically elevated to Tier 1.
6. Most of the requirements of the Interim Enhanced Surface Water Treatment Rule (63FR69477) (40C.F.R.§§141.170-141.171, 141.173-141.174) become effective January 1, 2002 for Subpart H systems (surface water systems and ground water systems under the direct influence of surface water) serving at least 10,000 persons. However, 40C.F.R.§141.172 has some requirements that become effective as early as April 16, 1999. The Surface Water Treatment Rule remains in effect for systems serving at least 10,000 persons even after 2002; the Interim Enhanced Surface Water Treatment Rule adds additional requirements and does not in many cases supercede the SWTR.
7. The arsenic MCL citations are effective January 23, 2006. Until then, the citations are §141.11 (b) and §141.23 (n).
8. The arsenic Tier 3 violation MCL citations are effective January 23, 2006. Until then, the citations are §141.23 (a), (l).
9. Failure to take a confirmation sample within 24 hours for nitrate or nitrite after an initial sample exceeds the MCL is a Tier 1 violation. Other monitoring violations for nitrate are Tier 3.

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10. The uranium MCL, Tier 2 violation citations are effective December 8, 2003 for all community water systems.
11. The uranium Tier 3 violation citations are effective December 8, 2000 for all community water systems.
12. Subpart H community and non-transient non-community systems serving > 10,000 must comply with new DBP MCLs, disinfectant MRDLs, and related monitoring requirements beginning January 1, 2002. All other community and non-transient non-community systems must meet the MCLs and MRDLs beginning January 1, 2004. Subpart H transient non-community systems serving 10,000 or more persons and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2002. Subpart H transient non-community systems serving fewer than 10,000 persons and using only ground water not under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with the chlorine dioxide MRDL beginning January 1, 2004.
13. §141.64(b)(1) and §141.132(a)-(b) apply until §§141.620-141.630 take effect under the schedule in §141.620(c).
14. Failure to monitor for chlorine dioxide at the entrance to the distribution system the day after exceeding the MRDL at the entrance to the distribution system is a Tier 2 violation.
15. If any daily sample taken at the entrance to the distribution system exceeds the MRDL for chlorine dioxide and one or more samples taken in the distribution system the next day exceed the MRDL, Tier 1 notification is required. Failure to take the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 notification.
16. Some water systems must monitor for certain unregulated contaminants listed in 40 C.F.R. §141.40.
17. This citation refers to §§1415 and 1416 of the Safe Drinking Water Act. §§1415 and 1416 require that "a schedule prescribed...for a public water system granted a variance (or exemption) shall require compliance by the system..."
18. In addition to §§1415 and 1416 of the Safe Drinking Water Act, 40 C.F.R. 142.307 specifies the items and schedule milestones that must be included in a variance for small systems.
19. Other waterborne emergencies require a Tier 1 public notice under §141.202(a) for situations that do not meet the definition of a waterborne disease outbreak given in 40 C.F.R. 141.2 but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.
20. States may place other situations in any tier they believe appropriate, based on threat to public health.
21. Failure to collect three or more samples for *Cryptosporidium* analysis is a Tier 2 violation requiring special notice as specified in §141.211. All other monitoring and testing procedure violations are a Tier 3.

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APPENDIX H

LIST OF ACRONYMS USED IN PUBLIC NOTIFICATION REGULATION

CCR	Consumer Confidence Report
CWS	Community Water System
DBP	Disinfection Byproduct
EPA	Environmental Protection Agency
HPC	Heterotrophic Plate Count
IESWTR	Interim Enhanced Surface Water Treatment Rule
IOC	Inorganic Chemical
LCR	Lead and Copper Rule
LT1ESWTR	Long Term 1 Enhanced Surface Water Treatment Rule
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MRDL	Maximum Residual Disinfectant Level
MRDLG	Maximum Residual Disinfectant Level Goal
NCWS	Non-Community Water System
NPDWR	National Primary Drinking Water Regulation
NTNCWS	Non-Transient Non-Community Water System
NTU	Nephelometric Turbidity Unit
OGWDW	Office of Ground Water and Drinking Water
OW	Office of Water
PN	Public Notification
PWS	Public Water System
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
SOC	Synthetic Organic Chemical
SWTR	Surface Water Treatment Rule
TCR	Total Coliform Rule
TT	Treatment Technique
TWS	Transient Non-Community Water System
VOC	Volatile Organic Chemical

APPENDIX I

Table C - List of Small Systems Compliance Technologies for Radionuclides And Limitations to Use

Unit technologies	Limitations (see foot-notes)	Operator skill level required[1]	Raw water quality range and considerations[1]
1. Ion exchange (IE)	(a)	Intermediate	All ground waters
2. Point of Use (POU)[2] (IE)	(b)	Basic	All ground waters
3. Reverse osmosis (RO)	(c)	Advanced	Surface waters usually require prefiltration
4. POU[2] (RO)	(b)	Basic	Surface waters usually require prefiltration
5. Lime softening	(d)	Advanced	All waters
6. Green sand filtration	(e)	Basic	
7. Co-precipitation with Barium sulfate	(f)	Intermediate to Advanced	Ground water with suitable water quality
8. Electroidalysis/electrodialysis reversal		Basic to intermediate	All ground waters
9. Pre-formed hydrous Manganese oxide filtration	(g)	Intermediate	All ground waters
10. Activated alumina	(a), (h)	Advanced	All ground waters, competing anion concentrations may affect regeneration frequency
11. Enhanced coagulation/filtration	(i)	Advanced	Can treat a wide range of water qualities

1. National Research Council (NRC), Safe Water from Every Tap: Improving Water Service to Small Communities. National Academy Press, Washington, D.C. 1997
2. A POU, or "point-of-use" technology is a treatment device installed at a single tap used for the purpose of reducing contaminants in drinking water at that one tap. POU devices are typically installed at the kitchen tap. See the April 21, 2000 NODA for more details.

Limitations Footnotes: Technologies for Radionuclides

a The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.
b When POU devices are used for compliance, programs for long-term operation, maintenance, and monitoring must be provided by water utility to ensure proper performance.
c Reject water disposal options should be carefully considered before choosing the technology. See other RO limitations described in the SWTR Compliance Technologies Table.
d The combination of variable source water quality and the complexity of the water chemistry involved may make this technology too complex for small surface water systems.
e Removal efficiencies can vary depending on water quality.
f The technology may be very limited in application to small systems. Since the process requires static mixing, detention basins, and filtration, it is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.
g This technology is most applicable to small systems that already have filtration in place.
h Handling of chemicals required during regeneration and pH adjustment may be too difficult for small systems without an adequately trained operator.
i Assumes modification to a coagulation/filtration process already in place.

APPENDIX J

Table D - Compliance Technologies by System Size Category for Radionuclide NPDWR's

Contaminant	Compliance technologies[1] for system size categories (population served)		
	25 - 500	501 - 3,300	3,300 - 10,000
1. Combined radium-226 and radium-228	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,9
2. Gross alpha particle activity	3,4	3,4	3,4
3. Beta particle activity and photon activity	1,2,3,4	1,2,3,4	1,2,3,4
4. Uranium	1,2,4,10, 11	1,2,3,4,5,10,11	1,2,3,4,5,10,11

Note: [1]Numbers correspond to those technologies found listed in the table C of Appendix I.