Sec. 19-13-B102. Standards for quality of public drinking water

(a) **Definitions.** As used in this section:

(1) "Action level" means the concentration of lead or copper in water specified in subsection (j)(6)(B) of this section which determines, in some cases, the treatment requirements contained in subsection (j)(6) of this section that a system is required to complete;

(2) "Active source of supply" means all springs, streams, watercourses, brooks, rivers, lakes, ponds, wells, or underground water from which water is taken on a regular or periodic basis for water supply purposes. A number of wells drawing water from a single aquifer or more than 1 surface water body or a combination of surface water and ground water sources connected to a common distribution system may be considered a single source of supply;

(3) "Annual average" means the arithmetic average of the quarterly averages of 4 consecutive quarters of monitoring;

(4) "Bag filters" means pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media and 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 the outside;

(5) "Bank filtration" means a water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s);

(6) "Cartridge filters" means pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media and 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;

(7) "CFR" means Code of Federal Regulations;

(8) "Certified distribution system operator" means an operator who has met the education, experience, and examination requirements specified in section 25-32-11 of the Regulations of Connecticut State Agencies and has been certified by the department;

(9) "Certified operator" means an operator who has met the education, experience, and examination requirements specified in sections 25-32-7a to 25-32-14, inclusive, of the Regulations of Connecticut State Agencies and has been certified by the department;

(10) "Certified water treatment plant operator" means an operator who has met the education, experience, and examination requirements of section 25-32-9 of the Regulations of Connecticut State Agencies and has been certified by the department;

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

(12) "Coliform" means a group of bacteria found in the intestines of warm-blooded animals (including humans) and found in plants, soil, air, and water;

(13) "Combined distribution system" means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive public water systems that receive finished water;

(14) "Community water system" or "CWS" means a public water system that serves at least 25 residents;

(15) "Compliance period" means a 3 calendar-year period within a compliance cycle. Each compliance cycle has 3 3-year compliance periods;

(16) "Compliance cycle" means the 9 calendar-year cycle during which public water systems shall monitor. Each compliance cycle consists of 3 3-year compliance periods. The first calendar year cycle began on January 1, 1993 and ended on December 31, 2001; the second began on January 1, 2002 and ended on December 31, 2010; the third began on January 1, 2011 and ends on December 31, 2019;

(17) "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 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 comprehensive performance evaluation shall comprise of a written report consisting of at least the following components:

(A) Assessment of plant performance;

(B) Evaluation of major unit processes;

(C) Identification and prioritization of performance limiting factors;

(D) Assessment of the applicability of comprehensive technical assistance;

(E) Identification of improvements selected by a public water system to enhance the treatment plant's capability to achieve compliance; and

(F) A schedule of dates for the implementation of the improvements;

(18) "Comprehensive technical assistance" means a performance improvement phase that is implemented using results from the comprehensive performance evaluation;

(19) "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;

(20) "Consecutive public water system" or "consecutive system" means a public water system that receives some or all of its finished water from 1 or more wholesale systems. Delivery may be through a direct connection or through the distribution system of 1 or more consecutive public water systems;

(21) "Consultation" means a telephone call, electronic mail exchange or meeting at which the public water system reports to the department the nature of the violation and the department, in turn, determines the action that shall be taken by the public water system;

(22) "Consumer" has the same meaning as provided in section 25-32a of the Connecticut General Statutes;

(23) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water;

(24) "Conventional filtration treatment" means a series of processes including coagulation, flocculation, sedimentation or dissolved air flotation, and filtration resulting in substantial particulate removal;

(25) "Corrosion inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials;

(26) "Cryptosporidium" means a protozoan found in the intestines of livestock and in

water contaminated by sewage or runoff containing animal waste;

(27) "CT" or "CTcalc" means the product of the "residual disinfectant concentration" (C) in milligrams per liter determined before or at the first consumer, and the corresponding "disinfectant contact time" (T) in minutes (i.e., "C" X "T"). If a public water system applies disinfectants at more than 1 point prior to the first consumer, it shall determine the CT of each disinfectant sequence before or at the first consumer to determine the total percent inactivation;

(28) "CT99.9" means the CT value required for 99.9 percent (3 log) inactivation of Giardia lamblia cysts;

(29) "Department" means the Department of Public Health;

(30) "Diatomaceous earth filtration" means a process resulting in substantial particulate removal in which a pre-coat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and while the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake;

(31) "Direct filtration" means a series of processes including coagulation and filtration, but excluding sedimentation, resulting in substantial particulate removal;

(32) "Direct integrity test" means a physical test applied to a membrane filtration unit in order to identify and isolate integrity breaches (i.e., 1 or more leaks that could result in contamination of the filtrate);

(33) "Disinfectant contact time" ("T" in CTcalc) 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;

(A) (A)Where only 1 "C" is measured (single application point), "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 which residual disinfectant concentration ("C") is measured;

(B) Where more than 1 "C" is measured (multiple application points), "T" is:

(i) For the first measurement of "C", the time in minutes that it takes for water to move from the first point of disinfectant application to a point before or at the point where the first "C" is measured; and

(ii) 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 subsequent "T" is being calculated;

(C) 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; and

(D) Disinfectant contact time within mixing basins, clearwells, and storage reservoirs shall be determined by tracer studies or an equivalent demonstration;

(34) "Disinfection" means a process which inactivates microbial pathogens in water by chemical oxidants or equivalent agents;

(35) "Disinfection profile" means a summary of daily giardia lamblia inactivation through the treatment plant;

(36) "Distribution system" means any combination of pipes, tanks, pumps, or similar

devices or mechanisms that deliver water from the sources, treatment facilities or storage facilities to the consumer;

(37) "Domestic or other non-distribution system plumbing problem" means a coliform contamination problem in a public water system with more than 1 service connection that is limited to the specific service connection from which the coliform-positive sample was taken;

(38) "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 Radiation Units and Measurements;

(39) "Drinking water" means water, treated or untreated, intended for human use and consumption, including, but not limited to, drinking, bathing, showering, cooking, dishwashing and maintaining oral hygiene;

(40) "Dual sample set" means a set of 2 samples collected at the same time and same location, with 1 sample analyzed for total trihalomethanes (TTHM) and the other sample analyzed for total haloacetic acids (HAA5);

(41) "EC medium plus MUG" means analytical tests for waterborne bacteria as specified in 40 CFR 141.21(f), as amended from time to time;

(42) "E. coli" or "Escherichia coli" means a species of fecal coliform that thrives at the body temperature of mammals;

(43) "End of the distribution system" means the last service connection on a dead-end water main;

(44) "Enhanced coagulation" means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment;

(45) "Enhanced softening" means the improved removal of disinfection byproduct precursors by precipitative softening;

(46) "EPA" means the United States Environmental Protection Agency;

(47) "Fecal coliform" means bacteria that grows in the colon of mammals and is transmitted through fecal material;

(48) "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;

(49) "Filtration" means a process for removing particulate matter from water by passage through porous media;

(50) "Finished water" means 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 is necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals);

(51) "First-draw sample" means a 1-liter sample of tap water, collected in accordance with subsection (e)(8)(B)(ii) of this section, that has been standing in plumbing pipes at least 6 hours and is collected without flushing the tap;

(52) "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;

(53) "Flowing stream" means a course of running water flowing in a definite channel;

(54) "GAC10" means granular activated carbon filter beds with an empty-bed contact time of 10 minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with the MCLs under subsection (e)(11)(B)(i) of this section is 120 days;

(55) "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;

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

(57) "Gross beta particle activity" means the total radioactivity due to beta particle emissions as inferred from measurements on a dry sample;

(58) "Ground water" means the supply of source water under the earth's surface that is not under the influence of surface water;

(59) "Ground water system" means a public water system that provides ground water, in whole or part, directly to consumers but does not include a public water system that combines ground water with surface water prior to treatment or ground water under the direct influence of surface water;

(60) "Ground water under the direct influence of surface water" or "GWUDI" means any water beneath the surface of the ground with either a significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as giardia lamblia or Cryptosporidium, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. The department determination of direct influence may be based on site-specific measurements of water quality or documentation of well construction characteristics and geology, or both, which may include a field evaluation;

(61) "Haloacetic acid 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 2 significant figures;

(62) "Hydrogeologic sensitivity assessment" or "HSA" means the department's act of making a determination of whether a ground water system obtains water from hydrogeologically sensitive settings taking into account information regarding the specific aquifer from which the system is drawing water, well construction records, characterization of the hydrogeology of the source aquifer, and whether the aquifer has a hydrogeologic barrier that would prevent the vertical movement of microbial pathogens from the surface into the aquifer;

(63) "Lake" means a natural or man-made basin or hollow on the earth's surface, including a reservoir, in which water collects or is stored that may or may not have a current or single direction of flow;

(64) "Large", when used in reference to a public water system, means serving more than 50,000 persons;

(65) "Lead service line" means a service line made of lead that connects the water main to a building inlet and any lead pigtail, gooseneck or other fitting connected to such lead line;

(66) "Legionella" means a genus of bacteria, some species of which have caused a type of pneumonia called legionnaires' disease;

(67) "Local director of health" means a city, town, borough, or district director of health or the director of health's authorized agent;

(68) "Locational running annual average" or "LRAA" means the average of sample analytical results for samples taken at a particular monitoring location during the previous 4 calendar quarters;

(69) "mg/l" means milligrams per liter;

(70) "Man-made beta particles and photon emitters" means all radionuclides emitting beta particles or photons, or both, listed in Maximum Permissible Body Burdens and Maximum Concentrations 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;

(71) "Maximum contaminant level" or "MCL" means the maximum permissible level of a contaminant in water that is delivered to any consumer of a public water system;

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

(73) "Maximum residual disinfectant level" or "MRDL" means a level of a disinfectant added for water treatment that shall not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDL is enforceable in the same manner as maximum contaminant level;

(74) "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. MRDLG is a non-enforceable health goal and does not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants;

(75) "Medium-size" means serving more than 3,300 and less than or equal to 50,000 persons;

(76) "Membrane filtration" means 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;

(77) "Method detection limit" or "MDL" means the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the true value is greater than 0;

(78) "Microbial pathogen" means a microorganism, such as a bacterium, virus or parasite, that can cause infection and illness in humans, including, but not limited to:

Echovirus, Coxsackie viruses, Hepatitis A and E, Rotavirus, Norovirus, E. coli, Salmonella species, Shigella species, and Vibrio cholerae;

(79) "Molecular Weight Cutoff" or "MWCO" means a measure of the removal characteristic of a membrane in terms of atomic weight or mass, as opposed to pore size, that is typically measured in terms of Daltons;

(80) "Near the first service connection" means at 1 of the 20 percent of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system;

(81) "Non-community water system" means a public water system that serves at least 25 persons at least 60 days out of the year and is not a community water system;

(82) "Non-transient non-community water system" or "NTNC" means a public water system that is not a community system and that regularly serves at least 25 of the same persons over 6 months per year;

(83) "Notification level" means the level of a contaminant that if exceeded shall require public notification by a public water system to its consumers;

(84) "Optimal corrosion control treatment" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while ensuring that the treatment does not cause the community water system or non-transient non-community water system to violate any drinking water statutes or regulations;

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

(86) "Physical parameters" means color, turbidity, pH, and odor;

(87) "Plant intake" means 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;

(88) "Point of disinfectant application" means the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water;

(89) "Point of entry" or "entry point" means a location on an active source of supply that is after any treatment and before the entrance to the distribution system;

(90) "Practical quantification level" or "PQL" means the lowest concentration that can be reliably measured within specific limits of precision and accuracy during routine laboratory operating conditions;

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

(92) "Public water system" or "system" means any water company supplying water to 15 or more consumers or 25 or more persons, based on the "Design Population" as defined in section 16-262m-8(a)(3) of the Regulations of Connecticut State Agencies, jointly administered by the department and the Public Utilities Regulatory Authority, daily at least 60 days of the year that does not meet all of the following conditions:

(A) Consists only of distribution and storage facilities;

(B) Does not have any treatment facilities, other than those for non-potable use;

(C) Obtains all of its water from, but is not owned or operated by, a public water system;

(D) Does not separately bill the consumers for water use or consumption; and

(E) Is not a carrier which conveys passengers in interstate commerce;

(93) "Raw water" means water in its natural state on the surface of the earth or underground;

(94) "Repeat sample" means a sample that is collected as a result of a total coliform-positive routine sample;

(95) "Reservoir" means a natural or man-made basin or hollow on the earth's surface, including a lake, in which water collects or is stored that may or may not have a current or single direction of flow;

(96) "Residual disinfectant concentration" or "RDC" ("C" in CTcalc) means the concentration of disinfectant measured in mg/l in a representative sample of water;

(97) "Routine sample" means a sample that is collected at a location and frequency as specified in the department-approved sample siting plan;

(98) "Sanitarian" means a person who is trained in environmental health and who is qualified to carry out educational and investigational duties in the fields of environmental health such as investigation of air, water, sewage, foodstuffs, housing and refuse by observing, sampling, testing and reporting; and who is licensed pursuant to section 20-361 of the Connecticut General Statutes;

(99) "Sanitary survey" means a review of a public water system by the department to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water;

(100) "Sedimentation" means a process for removal of solids before filtration by gravity or separation;

(101) "Self assessment" means an assessment which shall comprise a written report consisting of at least the following components:

(A) Assessment of filter performance;

(B) Development of a filter profile;

(C) Identification and prioritization of factors limiting filter performance;

(D) Assessment of the applicability of improvements;

(E) Identification of improvements selected by a public water system to enhance filtration and achieve compliance; and

(F) A schedule of dates for the implementation of the improvements;

(102) "Service line sample" means a 1 liter sample of water, collected in accordance with subsection (e)(8)(B)(iii) of this section, that has been standing for at least 6 hours in a service line;

(103) "Significant change to disinfection practice" means 1 of the following changes:

(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 department that has or may have a significant impact on disinfection practices or the effectiveness of such practices, or both;

(104) "Significant deficiency" means any situation, practice, or condition in a public water system with respect to design, operation, maintenance, or administration that the department determines to be causing, or has the potential for causing, risks to health or safety of the public served by the system. Significant deficiencies shall include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the

sources, treatment, including violations of subsection (j)(2) of this section, storage, or distribution system that the department determines to be causing, or has the potential for causing, the introduction of fecal contamination into the water delivered to consumers;

(105) "Single family structure" means a building constructed as a single-family residence that is currently used as either a residence or a place of business;

(106) "Slow sand filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.16 gallons per minute per square foot,) resulting in substantial particulate removal by physical and biological mechanisms;

(107) "Small" means serving 3,300 persons or fewer;

(108) "Source water" means raw water before any kind or type of treatment at the source of supply;

(109) "Special purpose sample" means a sample that is taken to determine whether disinfection practices are sufficient following routine maintenance work on the distribution system;

(110) "Subpart H system" means a public water system that is supplied by a surface water or ground water under the direct influence of surface water source, or both;

(111) "Surface water" means all water that is open to the atmosphere and subject to surface runoff;

(112) "SUVA" means specific ultraviolet absorption at 254 nanometers (nm), an indicator of the humic content of water. 1 nm is equal to 1 billionth (10-9) of a meter. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wavelength of 254 nm (UV254) (in m-1) by its concentration of dissolved organic carbon (DOC) in mg/l;

(113) "System with a single service connection" means a system that supplies drinking water to consumers via a single service line;

(114) "Tier 1 notice" means a notice that a public water system is required to provide for the following violations and other situations:

(A) Violation of the maximum contaminant level for total coliforms when fecal coliform or E. coli are present in the distribution system, or when the public water system fails to test for fecal coliforms or E. coli when any repeat sample tests positive for coliform;

(B) Violation of the maximum contaminant level for nitrate, nitrite, or total nitrate and nitrite, or when the public water system fails to take a confirmation sample not later than 24 hours after the public water system's receipt of the first sample showing an exceedance of the nitrate or nitrite maximum contaminant level;

(C) Violation of the maximum residual disinfectant level for chlorine dioxide when 1 or more samples taken in the distribution system the day following an exceedance of the maximum residual disinfectant level at the entrance of the distribution system exceed the maximum residual disinfectant level, or when the public water system does not take the required samples in the distribution system;

(D) Violation of the maximum contaminant level for turbidity as specified in subsections (e)(7)(H)(ii) and (j)(2)(D) of this section, where the department determines after consultation with the public water system that the violation of the maximum contaminant level for turbidity combined with other site-specific information indicate that potential pathogens may have passed the point of entry to the distribution system, or where the public water system does not consult with the department within 24 hours after the public water system

learns of the violation;

(E) Violation of the maximum contaminant level for turbidity as specified in subsection (j)(4) of this section, where the department determines after consultation with the public water system that the violation of the maximum contaminant level for turbidity combined with other site-specific information indicate that potential pathogens may have passed the point of entry to the distribution system, or where the public water system does not consult with the department within 24 hours after the public water system learns of the violation;

(F) Occurrence of a waterborne disease outbreak;

(G) Detection of any chemical listed in subsections (e)(2) through (e)(4), inclusive, of this section at a level that is determined by the department to have serious adverse effects on human health as a result of short-term exposure based on available scientific and epidemiological findings; or

(H) Detection of E. coli, enterococci, or coliphage in ground water source samples as specified in subsections (e)(12)(C) and (D) of this section.

(115) "Tier 2 notice" means a notice that a public water system is required to provide for the following violations and other situations:

(A) All violations of the maximum contaminant level, maximum residual disinfectant level or treatment technique requirements, except where a tier 1 notice is required or where a unit or value requirement under subsection (e)(1) of this section for color, turbidity, odor, or pH is exceeding;

(B) Violations of monitoring and testing procedure requirements for total coliforms, nitrate, nitrite, total nitrate and nitrite, or chlorine dioxide, except where a tier 1 notice is required;

(C) Failure to comply with the terms and conditions of any variance, order, consent order, consent agreement or exemption; or

(D) Failure to take corrective action or failure to maintain at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer under subsections (e)(7)(E)(vi) or (j)(14) of this section.

(116) "Tier 3 notice" means a notice that a public water system is required to provide for the following violations and other situations:

(A) Violation of a monitoring requirement, except where a tier 1 notice or a tier 2 notice is required;

(B) Failure to comply with a testing procedure requirement, except where a tier 1 notice or a tier 2 notice is required;

(C) Operation under an administrative order, variance, or an exemption;

(D) Failure to provide the notice of the availability of unregulated contaminant monitoring results, as required under 40 CFR 141.207, as amended from time to time; or

(E) Exceedance of the fluoride secondary maximum contaminant level, as required under 40 CFR 141.208, as amended from time to time.

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

(118) "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 to2 significant figures;

(119) "Total trihalomethanes" or "TTHM" means the sum of the concentrations in milligrams per liter of bromodichloromethane, dibromochloromethane, tribromoethane (bromoform) and trichloromethane (chloroform) rounded, to 2 significant figures;

(120) "Transient non-community water system" or "TNC" means a non-community water system that does not meet the definition of a non-transient noncommunity water system;

(121) "Treatment" means the process of altering the physical, chemical, biological or radiological quality of source water for use as drinking water;

(122) "Treatment technique" means a specific treatment method required by the department to control the level of contaminants in drinking water;

(123) "Two-stage lime softening" means a process in which chemical addition and hardness precipitation occur in each of 2 distinct unit clarification processes in series prior to filtration;

(124) "Uncovered finished water clearwell, tank or basin" means a container used to store water that shall undergo no further treatment to reduce microbial pathogens, except residual disinfection, and is directly open to the atmosphere;

(125) "Virus" means a microorganism of fecal origin which is infectious to humans by waterborne transmission;

(126) "Water company" has the same meaning as provided in section 25-32a of the Connecticut General Statutes;

(127) "Waterborne disease outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system as determined by the department;

(128) "Wholesale system" means 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 1 or more consecutive public water systems; and

(129) "Zone of influence" means the land area that directly overlies and has the same horizontal extent as the part of the water table or other potentiometric surface that is perceptibly lowered by the withdrawal of water. The zone of influence delineated by the use of modeling is that area of land in which the water table or potentiometric surface is lowered by at least 0.5 foot. In the event of inadequate information and data to delineate the zone of influence, a radius of 1 mile shall be utilized for unconsolidated aquifer ground water sources and a radius of ground water sources.

(b) **Watershed survey.** A public water system using surface water as an active source of supply shall make a sanitary survey of the watershed to the intake at least annually. A report on the survey shall be submitted to the Department by March 1 each year covering the preceding calendar year.

(c) **Standards for quality of untreated water prior to treatment**.

(1) All parameters in Table 1-C of this subdivision shall be tested for each surface water source at least annually, except bacteriological and physical tests which shall be done quarterly.

TABLE 1-C. MONITORING PARAMETERS FOR SURFACE WATER SOURCES

Parameter	*Degree of Treatment*	
	Disinfection and Chemical Treatment	*Filtration*
(A) Bacteriological.		
Coliform Organisms*	Not to exceed 100/100 ml monthly average, based on a running arithmetic average for the most recent twelve month period. No individual sample is to exceed 500/100 ml.	Not to exceed 20,000/100 ml as measured by a monthly geometric mean.

*If coliform organisms are demonstrated to be not associated with a fecal source on the basis of a sanitary survey and differential tests, an exception may be made.

(B) Physical.		
Color	Not to exceed 20 standard units in more than 10 percent of samples for most recent 12 month period.	Not to exceed 250 standard units as measured by a monthly geometric mean.
Turbidity	The turbidity level as specified in 40 CFR 141.74(a)(1), as amended from time to time, in a representative sample of the source water immediately prior to the first or only point of disinfection application shall not exceed 5 Nephelometric Turbidity Units (NTU).	Not to exceed 250 standard units as measured by a monthly geometric mean.

Parameter	*Degree of Treatment*	
	Disinfection and Chemical Treatment Level mg/l	*Filtration Level mg/l*
(C) Inorganic chemicals.		
Arsenic	.010	.010
Barium	1	1
Cadmium	.01	.01
Chloride	250	250
Chromium	.05	.05
Copper	.05	1.0
Cyanide	.01	0.2
Fluoride	2.0	2.0
Lead	.05	.05
MBAS (methylene	0.5	0.5

blue active substance)		
Mercury	.002	.005
Nitrate plus Nitrite as N	10	10
Selenium	.01	.01
Silver	.05	.05
(D) Pesticides.		All Degrees of Treatment Level mg/l
Endrin		0.002
Lindane		0.0002
Methoxychlor		0.04
Toxaphene		0.003
2,4-D		0.07
2,4,5-TP (silvex)		0.05

(2) (A) A system shall test a ground water source for the applicable contaminants listed in subsections (e)(1) through (e)(6), inclusive, of this section, if the department determines that reasonable grounds exist to suspect that any of the applicable contaminants may be present in the ground water source. For the purposes of this section, "reasonable grounds" means any information that is deemed to be credible by the department to indicate that the particular source is located on or in proximity to land on which the production, storage, use, or disposal of any of the contaminants listed in subsections (e)(1) through (e)(6), inclusive, of this section may have occurred.

(B) Testing for contaminants under subparagraph (A) of this subdivision shall be at a frequency and duration prescribed by the department. The department shall not require a system to test for contaminants under subparagraph (A) of this subdivision more frequently than once per quarter or for longer than a consecutive 4-quarter period unless a MCL is exceeded, the concentration of dieldrin exceeds 0.00003 mg/l, the concentration of methyl tertiary-butyl ether (MTBE) exceeds 0.07 mg/l, the concentration of 1,2,3-trichloropropane exceeds 0.0005 mg/l, the concentration of lead exceeds 0.015 mg/l, or the level of the contaminant or contaminants has increased when compared to previous results.

(d) **Facility location.** Such as but not limited to treatment plants, pumping stations, storage tanks, etc., but not including water intakes and connecting pipelines.

(1) New facilities are to be located: (A) Above the level of the one hundred year flood. (B) Where chlorine gas will not be stored or used within three hundred feet of any residence. (C) Where the facility is not likely to be subject to fires or other natural or manmade disasters.

(2) The state health department must be notified before entering into a financial commitment for a new public water system or increasing the capacity of an existing public water system, and the approval of the state health department must be obtained before any construction is begun. This includes construction of supply and treatment works,

transmission lines, storage tanks, pumping stations and other works of sanitary significance. It does not include the routine extension of laterals or tapping of new service connections.

(e) **Finished water.**

(1) Physical Tests.

(A) Color shall not exceed 15 standard units leaving the treatment plant nor at representative sampling points in the distribution system.

(B) Turbidity shall not exceed 5 standard units at representative sampling points in the distribution system.

(C) Odor shall not exceed a value of 2 in the treatment plant effluent on a scale of 0 to 5 as follows:

0-None 3-Distinct
1-Very Faint 4-Decided
2-Faint 5-Strong

(D) The pH value shall not be less than 6.4 nor exceed 10.0 at a point of entry to the distribution system or in the distribution system. A system conducting water quality parameter monitoring for pH in accordance with subsection (e)(9)(D) of this section shall comply with the pH requirements in subsection (j)(8)(G) of this section.

(2) Inorganic Chemicals

Community and non-transient non-community water systems shall test for inorganic chemicals specified below. Transient non-community water systems shall test for nitrate and nitrite only.

Inorganic chemicals[(a)] and their limits

Chemical	Maximum Contaminant Level mg/L
Antimony	0.006
Arsenic [(b)]	0.01
Asbestos	7 MFL [1]
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2
Fluoride	4.0
Mercury	0.002
Nickel	0.1
Nitrate nitrogen	10(as N)
Nitrite nitrogen	1(as N)
Nitrate nitrogen plus nitrite nitrogen	10(as N)
Selenium	0.05
Silver	0.05
Sulfate	**

Chloride	250
Thallium	0.002
Lead	***
Copper	***
Sodium	*

Notes

(a) The method detectionlimits for inorganic chemicals shall conform to those accepted and approved by EPA asdescribed in 40 CFR 141.23(a), as amended January 22, 2001.

(b) The MCL for arsenic iseffective January 23, 2006. Until then the MCL is 0.05 mg/L.

* Sodium has no MCL, but has a notificationlevel of 28 mg/L. See section 19-13-B102(i)(5)(B) of the Regulations of Connecticut StateAgencies for the notification requirements.

** MCL has not been established for thischemical.

*** See section 19-13-B102(j)(6) of theRegulations of Connecticut State Agencies. The MCLG for lead is zero (0) and for copper is1.3 mg/L.

[1] MFL = million fibers perliter longer than ten (10) micrometers.

(3) Pesticides, Herbicides and PCBs. Community and non-transient non-community water systems shall test for pesticides, herbicides and PCB specified below.

Pesticides, Herbicides, PCB, and their limits

Chemical[1]	*Maximum Contaminant Level (mg/l)*
Alachlor	0.002
Aldicarb	**
Aldicarb sulfoxide	**
Aldicarb sulfone	**
Aldrin	**
Atrazine	0.003
Benzo(A)pyrene	0.0002
Butachlor	**
Carbaryl	**
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalates	0.006
Dicamba	**
Dieldrin	**
Dinoseb	0.007

Diquat	0.02
Dibromochloropropane (DBCP)	0.0002
2,4-D	0.07
Ethylene dibromide (EDB)	0.00005
Endrin	0.002
Endothall	0.1
Glyphosate	0.7
Heptachlor	0.0004*
Heptachlor epoxide	0.0002*
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
3-Hydroxycarbofuran	**
Lindane	0.0002
Methoxychlor	0.04
Methomyl	**
Metolachlor	**
Metribuzin	**
Oxamyl (vydate)	0.2
Picloram	0.5
Propachlor	**
Simazine	0.004
2,3,7,8-TCDD (dioxin)	0.00000003
Polychlorinated biphenyls (PCB)	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2,4,5-TP (silvex)	0.05

Notes:

[1]The method detection limits for all pesticides, herbicides and PCB shall conform to those accepted and approved by EPA.

**MCL has not been established for this chemical.

*If monitoring results in detection of one (1) or more of these contaminants, then subsequent monitoring shall analyze for all these contaminants.

(4) Organic Chemicals.

CWSs and NTNCs shall test for the organic chemicals specified below in Table 4-E1 of this subdivision.

TABLE 4-E1. ORGANIC CHEMICALS[(a)] AND THEIR LIMITS

Chemical[(b)]	Maximum Contaminant Level (mg/l)
Benzene	0.005
Bromobenzene	**
Bromomethane	**
n-Butyl Benzene	**
Carbon Tetrachloride	0.005
Chlorobenzene	0.1
Chloroethane	**
Chloromethane	**
o-Chlorotoluene	**
p-Chlorotoluene	**
Dibromomethane	**
m-Dichlorobenzene	**
o-Dichlorobenzene	0.6
p-Dichlorobenzene	0.075
1, 1-Dichloroethane	**
1, 2-Dichloroethane (EDC)	0.005
1, 1-Dichloroethylene	0.007
cis-1, 2-Dichloroethylene	0.07
Trans-1, 2-Dichloroethylene	0.1
Dichloromethane (Methylene chloride)	0.005
1, 2-Dichloropropane	0.005
1, 3-Dichloropropane	**
2, 2-Dichloropropane	**
1, 1-Dichloropropene	**
1, 3-Dichloropropene	**
Ethylbenzene	0.7
Methyl Tert Butyl Ether (MTBE)	**
Naphthalene	**
n-Propyl Benzene	**
Styrene	0.1
1, 1, 1, 2-Tetrachloroethane	**
1, 1, 2, 2-Tetrachloroethane	**
Tetrachloroethylene	0.005
Toluene	1
Total Trihalomethanes (TTHM)	0.080

Bromodichloromethane	*
Bromoform	*
Chlorodibromomethane	*
Chloroform	*
1, 1, l-Trichloroethane	0.2
1, 1, 2-Trichloroethane	0.005
1, 2, 4-Trichlorobenzene	0.07
Trichloroethylene	0.005
1, 2, 3-Trichloropropane	**
1, 2, 4-Trimethylbenzene	**
1, 3, 5-Trimethylbenzene	**
Vinyl Chloride [(c)]	0.002
Xylenes (total)	10
m-Xylene	***
o-Xylene	***
p-Xylene	***

Notes:

*The MCL for Total Trihalomethanes (TTHM) is 0.080 mg/l, which is the sum of the 4 constituent Trihalomethanes.

**A MCL has not been established for this chemical.

***The MCL for Xylenes (total) is 10 mg/l, which is the sum of the 3 constituent Xylenes.

[(a)]The MDL for all organic chemicals is 0.0005 mg/l with the exception of MTBE which has an MDL of 0.002 mg/l.

[(b)]The department may require the testing of other chemicals for which a MCLG has been proposed by EPA or which the department has reason to believe may be health threatening.

[(c)]Quarterly analysis for vinyl chloride is required for ground water systems only when 1 or more of the following compounds are detected: trichloroethylene, 1, 2, Tetrachloroethylene, 1, 2 Dichloroethane, 1, 1, 1 Trichloroethane, Cis 1,2 Dichloroethylene, Trans 1, 2 Dichloroethylene, or 1, 1 Dichloroethylene. If the first analysis does not detect vinyl chloride, the department may reduce the frequency of vinyl chloride monitoring to once every 3 years.

(5) Radioactivity.

(A) Analysis for the contaminants listed in the table in 40 CFR 141.25(a), as amended January 22, 2001, shall be conducted to determine compliance with section 19-13-B102(e)(5)(I) to (L), inclusive, of the Regulations of Connecticut State Agencies in accordance with the methods described in 40 CFR 141.25(a), as amended January 22, 2001, or their equivalent determined by EPA in accordance with 40 CFR 141.27, as amended August 27, 1980.

(B) When the identification and measurement of radionuclides other than those listed in 40 CFR 141.25(a), as amended January 22, 2001, is required, the references listed in 40

CFR 141.25(b)(1), as amended January 22, 2001, and 40 CFR 141.25(b)(2), as amended January 22, 2001, are to be used, except in cases where alternative methods have been approved in accordance with 40 CFR 141.27, as amended August 27, 1980.

(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 (1.96s where s is the standard deviation of the net counting rate of the sample).

(i) To determine compliance with section 19-13-B102(e)(5)(I) of the Regulations of Connecticut State Agencies, the detection limit shall not exceed the concentrations in Table 1.

TABLE 1.—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

(ii) To determine compliance with Section 19-13-B102(e)(5)(J) of the Regulations of Connecticut State Agencies, the detection limits shall not exceed the concentrations listed in Table 2.

TABLE 2—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 the applicable limit

(D) To judge compliance with the maximum contaminant levels listed in section 19-13-102(e)(5)(I) to (L), inclusive, of the Regulations of Connecticut State Agencies, 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 department may 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.

(i) Community water systems (CWS) shall conduct initial monitoring to determine compliance with section 19-13-B102(e)(5)(I) of the Regulations of Connecticut State Agencies 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 section 19-13-B102(e)(5)(C) of the Regulations of Connecticut State Agencies.

(I) Applicability and sampling location for existing community water systems or sources. All existing CWS using ground water, surface water or systems using both ground and surface water (for the purpose of this section hereafter referred to as systems) shall 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 shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source.

(II) Applicability and sampling location for new community water systems or sources. All new CWS or CWS that use a new source of water shall begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. CWS shall conduct more frequent monitoring when ordered by the department 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.

(ii) Initial monitoring: systems shall conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

(I) Systems shall collect four consecutive quarterly samples at all sampling points before December 31, 2007.

(II) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the department 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 specified in Table 1 of section 19-13-B102(e)(5)(C)(i) of the Regulations of Connecticut State Agencies.

(III) If the average of the initial monitoring results for a sampling point is above the MCL, the system shall 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 department.

(iii) Reduced monitoring: the department may grant permission to a community water system 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:

(I) 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 1, in section 19-13-B102(e)(5)(c)(i) of the Regulations of Connecticut State Agencies, the system shall collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

(II) 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 1/2 the MCL,

the system shall 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 shall 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 1/2 the MCL, the system shall collect and analyze for that contaminant using at least one sample at that sampling point every six years.

(III) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above 1/2 the MCL but at or below the MCL, the system shall collect and analyze at least one sample at that sampling point every three years. For combined radium-226 and radium-228, the analytical results shall be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above 1/2 the MCL but at or below the MCL, the system shall collect and analyze at least one sample at that sampling point every three years.

(IV) Systems shall 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 1/2 MCL, then the next monitoring period for that sampling point is three years).

(V) If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system shall 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 department.

(iv) 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% (1.65s, where s 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 shall 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, 1/2 the detection limit shall 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 Section 19-13-B102(e)(5)(J) of the Regulations of Connecticut State Agencies for beta particle and photon radioactivity, a system shall monitor at a frequency as follows:

(i) Community water systems (both surface and ground water) designated by the department as vulnerable shall sample for beta particle and photon radioactivity. Systems shall 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 department. Systems already designated by the department shall continue to sample until the department reviews and either reaffirms or removes the designation.

(I) If the gross beta particle activity, or 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 department may reduce the frequency of monitoring at that sampling point to once every 3 years. Systems shall collect all samples required in paragraph (G)(i) of this section during the reduced monitoring period.

(ii) Community water systems (both surface and ground water) designated by the department as utilizing waters contaminated by effluents from nuclear facilities shall sample for beta particle and photon radioactivity. Systems shall 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 department. Systems already designated by the department as systems using waters contaminated by effluents from nuclear facilities shall continue to sample until the department reviews and either reaffirms or removes the designation.

(I) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples. The quarterly result is an average of the three monthly results.

(II) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the department, and in consultation with the community water system, more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

(III) Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of four quarterly samples. The annual result is an average of the four quarterly results.

(IV) If the gross beta particle activity beta 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 department may reduce the frequency of monitoring at that sampling point to every 3 years. Systems shall collect all samples required in subparagraph (G)(ii) of this subdivision during the reduced monitoring period.

(iii) Community water systems designated by the department to monitor for beta particle and photon radioactivity may not apply to the Department for a waiver from the monitoring frequencies specified in Section 19-13-B102(e)(5)(G)(i) or (ii) of the Regulations of Connecticut State Agencies.

(iv) 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 may 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 shall be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(v) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample shall be performed to identify the major radioactive constituents present in the sample and the appropriate doses shall be calculated and summed to determine compliance with Section 19-13-B102(e)(5)(J) of the Regulations of Connecticut State Agencies, using the formula in 40 CFR 141.66(d)(2), as amended December 7, 2000. Doses shall also be calculated and combined for measured

levels of tritium and strontium to determine compliance.

(vi) Systems shall monitor monthly at the sampling point(s) which exceed the maximum contaminant level in Section 19-13-B102(e)(5)(J) of the Regulations of Connecticut State Agencies, beginning the month after the exceedance occurs. Systems shall 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 shall return to quarterly monitoring until they meet the requirements set forth in Section 19-13-B102(e)(5)(G)(i)(I) or section 19-13-B102(e)(5)(G)(ii)(I) of the Regulations of Connecticut State Agencies.

(H) General monitoring and compliance requirements for radionuclides.

(i) The Department may require more frequent monitoring than specified in Section 19-13-B102(e)(5)(F) or (G) of the Regulations of Connecticut State Agencies, or may require confirmation samples for positive and negative results when the department determines that the source of supply is vulnerable or subject to contamination. The results of the initial and confirmation samples shall be averaged for use in compliance determinations.

(ii) Each public water systems shall monitor at the time designated by the department during each compliance period.

(iii) Compliance: Compliance with Section 19-13-B102(e)(5)(I) and (J) of the Regulations of Connecticut State Agencies, shall 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.

(I) 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.

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

(III) Systems shall 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.

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

(V) If a sample result is less than the detection limit, zero shall 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, 1/2 the detection limit shall be used to calculate the annual average.

(iv) If the department determines there has been an error in the methods applied to the collection or analysis of the sample, the department shall invalidate the sample result.

(v) If the MCL for radioactivity set forth in Section 19-13-B102(e)(5)(I) and (J) of the Regulations of Connecticut State Agencies, is exceeded, the community water system shall give notice to the department pursuant to section 19-13-B102(h) and (i), of the Regulations of Connecticut State Agencies and shall conform to public notification and consumer confidence reporting requirements pursuant to section 19-13-B102(i) of the Regulations of

Connecticut State Agencies.

(I) MCL for uranium, combined radium-226 and radium–228, and gross alpha particle activity (excluding radon and uranium). The maximum contaminant levels for uranium, combined radium-226 and radium-228 and gross alpha particle activity (including radium-226 but excluding radon and uranium) are listed in Table 3.

Table 3

Contaminant	**Maximum Contaminant Level**
Combined radium-226 and radium-228	5 Picouries Per Liter (pCi/L)
Gross alpha particle activity (including radium-226 but excluding radon and uranium)	15 pCi/L
Uranium	30 µg/l (Micrograms/Liter)

NOTE: 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.

(J) MCL for beta particle and photon radioactivity. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year (mrem/yr), as listed in Table 4. Except for radionuclides listed in Table 5, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated as described in 40 CFR 141.66(d)(2), as amended December 7, 2000. 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/yr.

Table 4

Contaminant	**Maximum Contaminant Level**
Beta particle and photon radioactivity	Concentration shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 mrem/yr

TABLE 5 – average annual concentrations assumed to produce: a total body or organ dose of 4 mrem/yr

Contaminant	**Critical Organ**	**Level**
Tritium	Total body	20,000 pCi/L
Strontium-90	Bone Marrow	8 pCi/L

(K) Compliance dates. Compliance dates for combined radium-226 and –radium-228, gross alpha particle activity, gross beta particle and photon radioactivity, and uranium: Community water systems shall comply with theMCLS listed in paragraphs (I) and (J) of this section and compliance shall be determined in accordance with the requirements of paragraphs (A) to (H), inclusive, of this section. Compliance with reporting requirements for the radionuclides under section 19-13-B102(i) of the Regulations of Connecticut State Agencies is required.

(L) The best available technologies (BATS) for compliance with the MCLS for

radionuclides shall conform to those approved by the U.S. EPA and specified in 40 CFR 141.66, as amended December 7, 2000.

(6) Total coliforms.

(A) The MCLG for microbiological contaminants which includes E. coli and fecal coliforms is zero (0).

(B) The maximum contaminant level (MCL) is based on the presence or absence of total coliforms in a sample, rather than coliform density. Compliance shall be based on a monthly MCL for total coliforms.

(i) For a system which collects at least forty (40) samples per month, if more than five percent (5.0%) of the samples collected during a month are total coliformpositive, the system is in violation of the MCL for total coliforms.

(ii) For a system which collects fewer than forty (40) samples per month, if more than one (1) sample collected during a month is total coliform-positive, the system is in violation of the MCL for total coliforms.

(C) A system shall determine compliance with the MCL for total coliforms for each month in which it is required to monitor for total coliforms.

(D) Analytical methodology.

(i) Analytical methods for total coliform. The analysis for total coliform should be conducted using either the membrane filter (MF) technique, or the 10-tube multiple tube fermentation (MTF) technique (five (5) tubes may be utilized provided they collectively equal one hundred (100) ml), or the presence-absence (P-A) coliform test, or the colilert system as approved and specified in 40 CFR 141.21 (f). The standard sample volume required for total coliform analysis, regardless of analytical method used, is one hundred (100) ml.

(ii) Analytical methods for fecal coliforms. The use of EC medium for determining the presence of fecal coliform in a total coliform-positive culture is required. The procedure for fecal coliform analysis shall conform to those approved by EPA.

(iii) Analytical methods for E. Coli. The analysis for E. Coli shall be conducted using either the EC medium plus MUG (4-methylumbelliferyl-B-D-glucoronice), the nutrient agar plus MUG test or other testing methods which conform to those approved by EPA.

(7) Monitoring requirements

(A) The monitoring frequency for total coliforms and physical parameters for a community water system (CWS) and a consecutive public water system is based on the population served by the system, and the frequency is as follows:

Table 1

Population Served	Minimum Number Of Routine Samples Per Month
25 to 1,000	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

If a CWS serving twenty-five (25) to one-thousand (1,000) persons has no history of total coliform violation in its current configuration, and a sanitary survey conducted in the past five (5) years shows that the system is supplied solely by a protected ground water source, and is free of sanitary defects pursuant to sections 19-13-B51a through 19-13-B51m of the Regulations of Connecticut State Agencies; the department may, if it is satisfied that this water is safe for consumption, reduce the monitoring frequency specified to no less than one (1) sample per quarter. Department approval of the reduced monitoring frequency shall be in writing. Water samples shall be collected by technical personnel employed by an environmental laboratory approved by the department under section 25-40 of the Connecticut General Statutes, or a certified distribution system operator, or a certified treatment plant operator, or a sanitarian, or an employee of the department, or a person under the direct supervision of either a certified distribution system operator, or a certified treatment plant operator.

The residual disinfectant concentration shall be measured at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in this subparagraph and subparagraph (G) of this subdivision. The presence of a residual disinfectant concentration in a sample from a system that is not approved for continuous

chlorination shall invalidate the sample.

(B) The monitoring frequency for total coliforms and physical parameters for non-community water systems is as follows:

(i) A non-community water system using only ground water sources that are not under the direct influence of surface water and serving one thousand (1,000) persons or fewer shall monitor during each calendar quarter that the system provides water to the public, except that the department may reduce this monitoring frequency, in writing, to no less than once a year if a sanitary survey shows that the system is free of sanitary defects pursuant to sections 19-13-B51a through 19-13-B51m of the Regulations of Connecticut State Agencies.

(ii) A non-community water system using only ground water sources that are not under the direct influence of surface water and serving more than one thousand (1,000) persons shall monitor as specified in Table 1. Monitoring shall begin no later than December 31, 1990.

(iii) A non-community water system using surface water, in total or in part, shall monitor at the frequency specified in Table 1, regardless of the number of persons it serves. Monitoring shall begin no later than December 31, 1990.

(iv) A non-community water system using groundwater under the direct influence of surface water, shall monitor at the frequency specified in Table 1. Monitoring shall begin six (6) months after the department determines that the ground water is under direct influence of surface water.

(v) The residual disinfectant concentration shall be measured at the same point in the distribution system and at the same time as total coliforms are sampled, as specified in this subparagraph and subparagraph (G) of this subdivision. The presence of a residual disinfectant concentration in a sample from a system that is not approved for continuous chlorination shall invalidate the sample.

(C) CWSs and NTNCs shall conduct monitoring to determine compliance with the MCLs specified in subsections (e)(2), (e)(3) and (e)(4) of this section.

(i) Monitoring frequency for CWSs and NTNCs. CWSs and NTNCs shall monitor in accordance with the frequencies listed in Table 7-C1 of this clause.

TABLE 7-C1. MONITORING FREQUENCY FOR CWSs AND NTNCs

Contaminant	BASE SAMPLING REQUIREMENT		REDUCED SAMPLING REQUIREMENT [5]	
	Ground Water Systems	Surface Water Systems [4]	Ground Water Systems	Surface Water Systems
Asbestos	Every 9 years	Every 9 years	Not Applicable	Not Applicable
Nitrate [1] Nitrite [1]	Annually	Quarterly	Not Applicable	Annually [2]
Inorganic chemicals	Every 3 years	Annually	Not Applicable	Not Applicable
Organic chemicals	Quarterly [6]	Quarterly [6]	Annually* [3]	Annually [3]
Pesticides, her	Quarterly [6]	Quarterly [6]	Systems serving more than 3,300	

bicides and polychlorinated biphenyls	persons: 2 quarters per year every 3 years [3]. Systems serving 3,300 persons or less; every 3 years [3]

Notes:

[1]Each TNC shall monitor annually for nitrate and nitrite.

[2]Applicable only if all analytical results from 4 consecutive quarters are less than 50 percent of the MCL.

[3] Applicable only if no single contaminant is detected in the results of the 4 consecutive quarters of the base sampling requirement.

*Reduce to once every 3 years after 3 years of no detection of any contaminant in annual sampling.

[4]Or GWUDI systems.

[5]Applicable only if approved in writing by the department.

[6]See subsections (e)(7)(C)(x), (xiii) and (xiv) of this section for exception.

(ii) A system shall monitor quarterly beginning in the next quarter, if in any 1 sample an inorganic chemical, with the exception of nitrate and nitrite, exceeds the MCL; organic chemical, pesticide, herbicide or polychlorinated biphenyl is detected at a level exceeding the MDL; or nitrate or nitrite exceeds or equals 50 percent of the MCL.

(iii) The department may decrease the quarterly monitoring requirement of clause (ii) of this subparagraph for inorganic chemicals, with the exception of nitrate and nitrite, to the base sampling requirement and organic chemicals, along with pesticides, herbicides and polychlorinated biphenyls, to annual sampling provided the department has determined that the system is reliably and consistently below the MCL for a minimum of 2 consecutive quarters for a ground water system and a minimum of 4 consecutive quarters for a surface water system. The department may decrease the quarterly monitoring requirement for systems which violated the MCL for organic chemicals, pesticides, herbicides and polychlorinated biphenyls to annual sampling provided that the system is reliably and consistently below the MCL for a minimum of 4 consecutive quarters. The department may decrease the quarterly monitoring requirement for systems which exceeded the MDL for a contaminant that does not have an established MCL to the reduced sampling requirement.

(iv) After 3 consecutive annual samples as required in clause (iii) of this subparagraph are less than the MDL, the department may allow a system to reduce the sampling frequency for organic chemicals, pesticides, herbicides and polychlorinated biphenyls to the reduced sampling requirement.

(v) After 4 consecutive quarterly samples as required in clause (ii) of this subparagraph are reliably and consistently less than the MCL for a ground water system and less than 50 percent of the MCL for a surface water system, the department may allow a system to reduce the sampling frequency for nitrate and nitrite to annually.

(vi) After the initial round of quarterly sampling is completed, a system that is monitoring annually shall take subsequent samples during the quarter(s) that resulted in the highest analytical result.

(vii) The department may increase the required monitoring frequency to detect variations within the system.

(viii) Each system shall monitor at the time designated by the department within each compliance period.

(ix) The department may determine compliance or initiate enforcement action based upon analytical results or other information compiled by the department.

(x) With the exception of nitrate, nitrite and TTHM, the department may allow the use of monitoring data collected after January 1, 1990 to satisfy the base sampling requirement provided the data is generally consistent with subsection (e) of this section for pesticides, herbicides, polychlorinated biphenyls, organic chemicals and inorganic chemicals. Systems which use grandfathered samples of organic chemicals and did not detect any contaminant listed in subsection (e)(4) of this section shall monitor annually.

(xi) The department may grant a system a waiver from monitoring for dioxin if the department determines that the watershed or zone of influence has not been or is not being used for any of the following land uses: pesticides and herbicides manufacturer, pulp and paper manufacturer, plastics manufacturer, wood preservative manufacturer, landfill and domestic waste transfer station, or hazardous waste disposal facility, and that the system has no water quality history indicating the presence of dioxin. The waiver shall be in writing and is subject to renewal for each compliance period. To request a waiver from monitoring, the system shall submit an application to the department in accordance with subsection (t) of this section. Such application shall include documentation that the watershed or zone of influence has not been or is not being used for pesticides and herbicides manufacturer, pulp and paper manufacturer, plastics manufacturer, wood preservative manufacturer, a landfill and domestic waste transfer station, or a hazardous waste disposal facility and that the system has no water quality history indicating the presence of dioxin. If the department grants the waiver, the system is not required to monitor for the compliance period for which the waiver is granted.

(xii) The department may grant a system a waiver from monitoring for endothall if the department determines that within the past year endothall has not been applied to any body of water, or to turf on sod farms or golf courses within the watershed or zone of influence of the source of supply. The waiver shall be in writing and is subject to renewal for each compliance period. To request a waiver from monitoring, the system shall submit an application to the department in accordance with subsection (t) of this section. Such application shall include documentation that within the past year endothall has not been applied to any body of water or to turf on sod farms or golf courses within the watershed or zone of influence of the source of supply. If the department grants the waiver, the system is not required to monitor for the compliance period for which the waiver is granted.

(xiii) The department may grant a system a waiver from the monitoring requirement for pesticides, herbicides and polychlorinated biphenyls if the department determines that the system's previous analytical results, collected from the source of supply and analyzed in accordance with the EPA's approved testing techniques and methodologies, showed no detectable limit of the contaminant to be waived and the source of supply is constructed and protected pursuant to sections 19-13-B32 and 19-13-B51d of the Regulations of Connecticut State Agencies. The waiver shall be in writing and is subject to renewal for each compliance period. To request a waiver from monitoring, the system shall submit an application to the department in accordance with subsection (t) of this section. Such

application shall include documentation that the system's previous analytical results, collected from the source of supply and analyzed in accordance with the EPA's approved testing techniques and methodologies, showed no detectable limit of the contaminant and that the source of supply is constructed and protected pursuant to sections 19-13-B32 and 19-13-B51d of the Regulations of Connecticut State Agencies. If the department grants the waiver, the system is not required to monitor for the compliance period for which the waiver is granted.

(xiv) The department may grant a system a waiver from the monitoring requirement for organic chemicals (VOCs) if the department determines that the contaminant has not been previously used within the watershed or zone of influence and that the system's initial monitoring results showed no detectable limit of the contaminant to be waived. The waiver shall be in writing and is subject to renewal for each compliance period. To request a waiver from monitoring, the system shall submit an application to the department in accordance with subsection (t) of this section. Such application shall include documentation that the contaminant has not been previously used within the watershed or zone of influence and the system's initial monitoring results showed no detectable limit of the contaminant. If the department grants the waiver, the system is not required to monitor for the compliance period for which the waiver is granted. As a condition of the waiver, the system shall take 1 sample at each sampling point during the time the waiver is effective.

(xv) All systems that use a new source of water that began operation after January 22, 2004, shall demonstrate compliance with the MCL for inorganic chemicals, organic chemicals, pesticides, herbicides, and polychlorinated biphenyls. The system shall also comply with the initial sampling frequencies specified by the department to ensure a system can demonstrate compliance with the MCL. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this section.

(D) Sampling sites.

(i) Systems shall collect total coliform and physical samples at sites that are representative of water throughout the distribution system, according to that system's written sample siting plan. These plans are subject to department review, revision and approval. Systems shall collect the monthly samples at regular intervals throughout the month, except that a system that uses ground water sources that are not under the direct influence of surface water and serves one thousand (1,000) persons or fewer, may collect all required samples on a single day if they are taken from different sites. The siting plan is to be reviewed as necessary and is subject to approval by the department, usually in conjunction with the sanitary surveys.

(ii) Samples for organic chemicals, inorganic chemicals, pesticides, herbicides and PCB shall be collected after treatment, if any, at every entry point to the distribution system which is representative of each active source of supply. If the system draws water from more than one active source of supply and the sources are blended before distribution, and the system elects to sample the blended water, the system shall then sample at an entry point to the system during periods when water representative of these sources is being used. The department may designate additional sampling points within the distribution system or at consumers' taps, which more accurately determine consumer exposure. All samples shall be taken at the same sampling point unless the department determines that conditions make

another sampling point more representative of each source, treatment plant or the distribution system. If a source is not active, it shall be tested when activated and subject to approval by the department prior to being put into service.

(iii) Systems shall collect the asbestos sample(s) from the distribution system at a location that is representative of each entry point. When applicable, the sample(s) shall be collected from a tap served by an asbestos cement pipe and under conditions where asbestos contamination is most likely to occur.

(iv) The department may reduce the total number of samples a system shall analyze for asbestos, organic chemicals, pesticides, herbicides and PCB by allowing the use of compositing. Composite samples from a maximum of five (5) sampling points within a single system for all public water systems and from different systems for systems serving three thousand three hundred (3,300) persons or less are allowed, provided that the method detection limit (MDL) used for analysis multiplied by the number of composite samples is less than the MCL (e.g., MDL multiplied by the number of samples is less than the MCL). Compositing of samples shall be done in a state approved laboratory and analyzed within fourteen (14) days of sample collection. If the concentration in the composite sample is greater than or equal to the method detection limit of any contaminant listed in subsections (e)(2) through (e)(4) of this section, then a follow-up sample shall be taken and analyzed within fourteen (14) days from each sampling point included in the composite. These samples shall be analyzed for the contaminants that were detected in the composite sample. If duplicates of the original sample taken from each sampling point used in the composite are available, then the system may use these instead of resampling. The duplicates shall be analyzed and the results reported to the department within fourteen (14) days of collection.

(E) Sanitary surveys.

(i) General requirements.

(I) A sanitary survey shall include, but not be limited to, an onsite inspection by the department of the system's water source or sources, facilities, operations, maintenance, and monitoring compliance program.

(II) Only the department or an agent approved by the department may conduct a sanitary survey. The department shall review the sanitary survey results to determine the adequacy of the system, including the existing monitoring frequency. The system is responsible for ensuring that the survey takes place.

(III) Systems shall provide to the department, at the department's request, any information that will enable the department to conduct a sanitary survey including, but not limited to information necessary to perform a HSA.

(IV) In conducting a sanitary survey of a system using ground water, information on sources of contamination within the delineated wellhead protection area shall be considered. If such information had been collected since the last sanitary survey, a special study to collect new information is not necessary.

(V) The department, during a sanitary survey, shall identify sources of contamination using the results of source water assessments or other relevant information.

(VI) The system's certified operator shall be present at the sanitary survey.

(ii) Sanitary survey frequency.

(I) A sanitary survey shall be completed no less frequently than every 3 years for CWSs

and every 5 years for non-community water systems. The department may conduct more frequent sanitary surveys for any system.

(1) The initial sanitary survey for each CWS shall be conducted by December 31, 2012, unless the CWS provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log inactivation and removal before or at the first consumer for all of the system's ground water sources, in which case the initial sanitary survey shall be conducted by December 31, 2014.

(2) The initial sanitary survey for each non-community water system shall be conducted by December 31, 2014.

(II) The department may conduct sanitary surveys once every 5 years for a CWS that uses only ground water sources if the CWS provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log inactivation and removal before or at the first consumer for all of the CWS's ground water sources.

(III) The department may use a phased review process to meet the requirements of this clause if all the applicable components of the sanitary survey under clause (iii) of this subparagraph are evaluated within the required interval.

(iii) Sanitary survey components.

A sanitary survey is composed of, but not limited to, an evaluation of the following 8 components:

(I) Source;

(II) Treatment;

(III) Distribution system;

(IV) Finished water storage;

(V) Pumps, pump facilities, and controls;

(VI) Monitoring, reporting, and data verification;

(VII) System management and operation; and

(VIII) Compliance by the system with the requirements in sections 25-32-7a through 25-32-14, inclusive, of the Regulations of Connecticut State Agencies.

(iv) Response to significant deficiencies or violations of the Regulations of Connecticut State Agencies in the sanitary survey report or other written notification.

(I) If the department identifies significant deficiencies or violations of the Regulations of Connecticut State Agencies adopted under Titles 19a or 25 of the Connecticut General Statutes that relate to the sanitary survey components in clause (iii) of this subparagraph at a system, then the department shall issue a sanitary survey report or other written notification to the system containing the system's significant deficiencies or violations, or both, and may require the system to implement a specific corrective action as set forth in subclause (VI) of this clause or a specific interim measure as set forth in subclause (VII) of this clause, or both.

(II) Unless the department in the sanitary survey report or other written notification requires a system to implement a specific corrective action for a significant deficiency, a system shall consult with the department regarding appropriate corrective action and a schedule for implementing corrective action not later than 30 days after receiving the sanitary survey report or other written notification. The department may require a system to comply with department-specified interim measures as set forth in subclause (VII) of

this clause pending completion of corrective action.

(III) Not later than 45 days after receiving the sanitary survey report or other written notification, or earlier if directed by the department:

(1) The system shall, unless the department in the sanitary survey report or other written notification requires a system to implement a specific corrective action for a significant deficiency, submit an application to the department requesting approval of the corrective actions the system will take to address the significant deficiencies, and the proposed schedule for completing such actions. Such application shall be submitted in accordance with subsection (t) of this section. If the department approves such application, such application shall constitute the department-approved corrective action plan and schedule.

(2) If the department in the sanitary survey report or other written notification requires the system to implement a specific corrective action for a significant deficiency, the system shall notify the department that the system will complete, or has completed, the specified corrective action by a date certain. Such response shall be submitted in accordance with subsection (t) of this section.

(3) If the department in the sanitary survey report or other written notification identifies a violation or violations of the Regulations of Connecticut State Agencies, the system shall submit to the department an application requesting approval of the actions the system will take, or has taken, to address the violation or violations and the proposed schedule for completing such actions. Such application shall be submitted in accordance with subsection (t) of this section.

(IV) Not later than 120 days after receiving the sanitary survey report or other written notification, or earlier if directed by the department, a system with a significant deficiency or deficiencies shall:

(1) Have either completed the corrective action and any interim measures required by the department in the sanitary survey report or other written notification or have completed corrective action and any interim measures in accordance with a department-approved corrective action plan and schedule; or

(2) Be in compliance with a department-approved corrective action plan and schedule unless the system has applied for and the department granted a modification. A system may seek to modify the department-approved corrective action plan and schedule by submitting an application to the department requesting approval of the proposed modification or modifications to the department-approved corrective action plan and schedule in accordance with subsection (t) of this section. Such application shall contain the proposed modification or modifications to the department-approved corrective action plan and schedule. The system is required to comply with the department-approved corrective action plan and schedule until such modification or modifications are approved.

(V) When a significant deficiency is identified at a Subpart H system, the Subpart H system shall comply with the provisions of this clause, except in cases where the department determines that the significant deficiency is located in a portion of the distribution system that is served solely by a surface water or GWUDI source. If the significant deficiency is located in a portion of the distribution system that is served solely by a surface water or GWUDI source, the department may choose not to require the Subpart H system to implement 1 or more of the corrective actions in subclauses (VI)(1) through (3), inclusive,

of this clause.

(VI) The department shall require in a sanitary survey report or other written notification or a department-approved corrective action plan a ground water system with a significant deficiency or deficiencies to implement 1 or more of the following corrective actions in subclauses (VI)(1) through (4), inclusive, of this clause and a Subpart H system with a significant deficiency or deficiencies to implement 1 or more of the corrective actions in subclauses (VI)(1) through (3), inclusive, of this clause.

(1) Correct all significant deficiencies;

(2) Provide an alternate source of water;

(3) Eliminate the source of contamination; or

(4) Provide treatment that reliably achieves at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the ground water source.

(VII) Interim measures include, but are not limited to the following:

(1) Provision of an alternate source of water;

(2) Notice to consumers to boil all water to be used for consumption;

(3) Temporary disinfection of water in a manner prescribed by the department; and

(4) Inactivation of a water source or sources.

(v) Regardless of whether the system is a CWS or a NTNC, if such system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer, such system shall have an operator who is certified pursuant to subsection 25-32-9 of the Regulations of Connecticut State Agencies.

(vi) Treatment technique violations.

(I) A system with a significant deficiency is in violation of a treatment technique requirement if, not later than 120 days after receiving the sanitary survey report or other written notification, or earlier if directed by the department, the system:

(1) Does not complete corrective action in accordance with the sanitary survey report or other written notification, if the department in the sanitary survey report or other written notification requires the system to implement a specific corrective action or a specific interim measure, or both, or, if the system has a department-approved corrective action plan, in accordance with the department-approved corrective action plan and schedule, including department-specified interim measures, if any; or

(2) Is not in compliance with a department-approved corrective action plan and schedule.

(II) Systems shall give public notification under subsection (i)(2) of this section for the treatment technique violations specified in subclause (I) of this clause.

(F) Invalidation of total coliform-positive samples. The department may invalidate a total coliform-positive sample only if:

(i) The department approved laboratory establishes and verifies in writing that improper sample analysis caused the total coliform-positive result.

(ii) The system determines that the contamination is a domestic or other non-distribution system plumbing problem on the basis that one (1) or more repeat sample(s) taken at the same tap as the original total coliform-positive sample is total coliform-positive, but all repeat samples at nearby sampling locations are total coliform-negative. (The department

cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative, or if the system has only one (1) service connection.)

(iii) The department has substantial grounds to believe that a total coliform-positive result is due to some circumstance or condition that does not reflect water quality in the distribution system, if the basis for this determination with the rationale for the decision is documented in writing, this document is signed and approved by the supervisor of the department official who makes this determination, and the documentation is made available to EPA and the public. In this case, the system shall still collect all repeat samples as required in subparagraph (G) of subsection 19-13-B102(e)(7) of the regulations of Connecticut State Agencies. The department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(G) Repeat monitoring/additional routine samples:

(i) If a routine sample is confirmed total coliform-positive, the system shall collect a set of repeat samples within twenty-four (24) hours of the confirmed positive result according to Table 2.

Table 2 - Monitoring Requirements Following A Total Coliform-Positive Routine Sample:

Routine Samples/Mo	*Repeat Samples*[1]	*Routine Samples* Next Month[2]
1/Mo. or fewer	4	5/Mo.
2/Mo.	3	5/Mo.
3/Mo.	3	5/Mo.
4/Mo.	3	5/Mo.
5/Mo. or more	3	Table 1[3]

[1] Number of repeat samples in the same month for each total coliform-positive routine sample.

[2] Except where the department has invalidated the original routine sample.

[3] System need not take any additional samples beyond those it is required to take according to Table 1.

The department shall extend the twenty-four (24) hour limit to no more than ninety-six (96) hours provided the system verifies that their contract laboratory is closed for the weekend or holidays or their sample sites are unavailable. (Waiver shall be requested and granted before the original twenty-four(24) hour period elapses.)

(ii) The system shall collect at least one (1) repeat sample from the sampling tap where the original total coliform-positive sample was taken and at least one (1) repeat sample at a tap within five (5) service connections upstream and at least one repeat sample at a tap within five (5) service connections downstream of the original sampling site. For those systems that shall collect four (4) repeat samples, the fourth repeat sample can be collected from any distribution sampling point within the system. If a total coliform-positive sample is at the end or at the beginning of the distribution system, the system shall collect one (1) repeat sample at the original sampling point and the other required repeat samples at

sampling points within five (5) service connections upstream or downstream from the original sampling point.

(iii) The system shall collect all repeat samples on the same day, except that the department may allow a system with a single service connection to collect the required set of repeat samples over a four-day period or to collect a larger volume repeat sample(s) in one (1) or more sample containers of any size, as long as the total volume collected is at least 400 ml (300 ml for systems that collect more than one (1) routine sample/month) provided four (4) separate sampling locations are not available.

(iv) If 1 or more samples in the set of repeat samples is confirmed total coliform-positive, the system shall collect an additional set of repeat samples. The system shall collect the additional samples not later than 24 hours after the confirmed positive result, unless the department extends the 24-hour limit under clause (i) of this subparagraph. The system shall repeat this process until either total coliforms are not detected in 1 complete set of repeat samples or the system determines that the MCL for total coliforms has been exceeded and notifies the department.

(v) If after a system collects a routine sample and before it learns the results of the analysis of that sample, it collects another routine sample(s) from within five (5) adjacent service connections of the initial sample, and the initial sample after analysis is found to contain total coliforms; then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(vi) If one (1) or more repeat samples in the set is confirmed total coliform-positive, the system shall collect an additional set of repeat samples. The system shall collect the additional samples within twenty-four (24) hours of the confirmed positive result, unless the department extends the limit as noted in subparagraph (7)(G)(i) of this subsection. The system shall repeat this process until either total coliforms are not detected in one (1) complete set of repeat samples or the system determines that the MCL for total coliforms has been exceeded and notifies the department.

(vii) Results of all routine and repeat samples not invalidated by the department shall be included in determining compliance with the MCL for total coliforms. Special purpose samples shall not be used to determine compliance with the MCL for total coliforms.

(H) A system that uses a groundwater source under the direct influence of surface water, and that does not provide and operate treatment pursuant to section 19-13- B102 (j)(2) of the Regulations of Connecticut State Agencies, shall collect and test for total coliform and turbidity levels as specified in the following subclauses:

(i) The system shall collect at least one (1) total coliform sample which shall be collected near the first service connection each day the turbidity level of the source water exceeds one (1) nephelometric turbidity unit (NTU). The system shall collect this coliform sample within twenty-four (24) hours of the first exceedance of one (1) NTU, unless the department waives this requirement as noted in subparagraph (7)(G)(i) of this subsection. Sample results from this coliform monitoring shall be included along with the results of all acceptable, as determined by the department, routine and repeat samples in determining compliance with the MCL for total coliforms.

(ii) The system shall perform tests for turbidity on samples collected, at least daily, at a point or points representative of water entering the distribution system. The system shall

conduct such tests in accordance with the method as specified in 40 CFR 141.74(a)(1). When the turbidity of any such sample exceeds one (1) nephelometric turbidity unit (NTU), the sampling shall be repeated and a new test made for turbidity within one hour of the original test or as soon as practical. If the repeat test also exceeds the turbidity limit of one (1) NTU, this shall be reported to the department within twenty-four (24) hours. If the monthly average exceeds one (1) NTU, or if the average of two (2) samples taken on consecutive days exceeds five (5) NTU, it shall be reported to the department within twenty-four (24) hours.

(I) Fecal coliform and E. coli requirements.

(i) If any routine or repeat sample is total coliform-positive, the system shall analyze that total coliform-positive culture medium to determine if fecal coliforms or E. coli are present. The system shall notify the department by the end of the day on which the system is notified of the positive test result but not later than 96 hours after the time of sample collection. If the department's office is closed at that time, notification shall be made before the end of the next business day.

(ii) If any repeat sample is fecal coliform-positive or E. coli-positive, or if a fecal coliform-positive or E. coli-positive routine sample is followed by a total coliform-positive repeat sample and the repeat sample is not invalidated, the system is in violation of the MCL for total coliforms. This is an acute risk violation of the MCL for total coliforms.

(J) Heterotrophic bacteria interference (HBI).

(i) A laboratory analysis shall be conducted by an environmental laboratory issued a certificate of approval by the department pursuant to section 19a-29a of the Connecticut General Statutes.

(ii) A laboratory shall invalidate any total coliform sample which produces: a turbid culture in the absence of gas production using the multiple tube fermentation (MTF) technique, or a turbid culture in the absence of an acid reaction using the presence-absence (P-A) coliform test, or confluent growth or a colony number that is "too numerous to count" using the membrane filter (MF) technique (unless total coliforms are detected).

(iii) If a laboratory invalidates a total coliform sample under clause (ii) of this subparagraph, the system shall collect another sample from the same location not later than 24 hours after notification from the laboratory that such sample is invalidated, and have the sample analyzed for total coliforms. If HBI occurs in the replacement sample, the system shall continue to resample at the same location not later than 24 hours after notification of the laboratory until a sample in which HBI does not occur is obtained. The results of the sample in which HBI does not occur shall be included in compliance calculations.

(K) Sampling protocol.

(i) Where a different schedule is prescribed pursuant to federal regulations, as they may be amended from time to time, the more stringent testing schedule shall apply.

(ii) Laboratory analyses shall be conducted using EPA sampling and testing methods and by an environmental laboratory approved by the department under section 19a-29a of the Connecticut General Statutes.

(iii) Water samples shall be collected by technical personnel employed by an environmental laboratory issued a certificate of approval by the department under section 19a-29a of the Connecticut General Statutes, or a certified distribution system operator, or

a certified treatment plant operator, or a sanitarian, or an employee of the department, or a person under the direct supervision of either a certified laboratory, a certified distribution system operator or a certified treatment plant operator.

(iv) Analytical methods for all inorganic chemicals, organic chemicals, pesticides, herbicides and polychlorinated biphenyls shall conform to those approved by EPA and described in 40 CFR 141.23(k), as amended from time to time, and 40 CFR 141.24(e), as amended from time to time. Analyses for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature shall be conducted pursuant to 40 CFR 141.89, as amended from time to time.

(v) Inorganic samples shall be collected and handled in accordance with 40 CFR 141.23(k)(2), as amended from time to time.

(vi) Arsenic sampling results shall be reported to the nearest 0.001mg/l.

(L) Where the fluoride content is artificially adjusted, tests for fluoride shall be made on each source so adjusted at least daily. The fluoride content of such supplies shall be maintained between 0.8 mg/l and 1.2 mg/l. If the monthly average of the daily tests does not fall within these limits it shall be reported as a failure to comply with this subparagraph. If warranted by conditions that may be detrimental to the health of consumers, samples from each fluoridated source shall be submitted to the department for testing.

(M) Where the water is chlorinated, at least daily tests shall be made for residual chlorine. A system that uses a GWUDI source and does not provide and operate treatment pursuant to subsection (j)(2) of this section shall disinfect in accordance with subsection (j)(3)(B) of this section.

(N) pH and phosphate monitoring.

(i) Where the pH value is artificially adjusted, tests for pH value shall be made of the treated water daily, or as required by the department.

(ii) Where phosphate or other corrosion control chemicals are used, tests shall be made for the phosphate level or for other chemicals involved in the corrosion control treatment at least once every two weeks, or as required by the department. The tests shall be done at a location(s) approved by the department.

(O) In cases where a consecutive public water system receives all of the system's water from 1 or more wholesale systems, tests for inorganic chemicals, organic chemicals, pesticides, herbicides, polychlorinated biphenyls and radioactive substances need not be made by the consecutive public water system except for lead, copper and asbestos which shall be tested in both systems according to subparagraph (C) of this subdivision and subsection (e)(8) of this section. Bacteriological and physical tests shall be performed at the required frequencies by both systems. The department may waive asbestos testing for a consecutive public water system that receives all of the system's water from 1 or more wholesale systems, if the system can verify that it does not have any asbestos cement pipes in its distribution system.

(P) Confirmation samples.

(i) Where the results of sampling for inorganic chemicals, organic chemicals, pesticides, herbicides and PCB, with the exception of nitrate, nitrite and TTHM exceed the MCL, the department may require that one additional sample be collected no later than two (2) weeks after the first sample is taken. The confirmation sample shall be collected at the same

sampling point as the first sample.

(ii) Where nitrate or nitrite sampling results exceed the MCL, the system shall take a confirmation sample within twenty-four (24) hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the twenty-four (24) hour sampling requirement shall immediately notify the consumers in accordance with subsection 19-13-B102(i) of the regulations of Connecticut State Agencies. Systems exercising this option shall take and analyze a confirmation sample within two (2) weeks of notification of the analytical results of the first sample.

(iii) 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 subparagraph (Q) of this subsection. The department has the discretion to delete results of obvious sampling errors.

(iv) The department may require more frequent monitoring than specified or may require confirmation samples for positive and negative results when the department determines that the source of supply is vulnerable and subject to contamination.

(Q) Compliance.

(i) For systems that are conducting monitoring at a frequency greater than annual compliance with the MCL, with the exception of THHM, nitrate and nitrite shall be determined based on the results of a running annual average of quarterly sampling for each sampling location. If more than one (1) sample is collected at a location during a quarter, the results of the samples shall be averaged to obtain a single result of that quarter. If one (1) location's running annual average is greater than the MCL, then the system shall be deemed to be out of compliance. A system deemed out of compliance shall be subject to a departmental enforcement action. If any one (1) positive sample result would cause the annual average to be exceeded, then the system shall be deemed to be out of compliance immediately. The department may also require a resample of a negative result when the validity of the results, as determined by the department, may be inaccurate. All sample results shall be compiled in determining compliance. When calculating results for compliance, any chemical result that is reported as being below the MDL for that chemical shall be counted as a zero (0). If a system fails to collect the required number of samples, compliance shall be based on the average concentration of the total number of samples collected. The system shall not be considered in violation of the MCL until it has completed one year of quarterly sampling. If a confirmation sample is required by the department the determination of compliance shall be based on the average of the two (2) samples.

(ii) If any sample exceeds the MCL for nitrate or nitrite, the system shall take a confirmation sample. The compliance determination is based on the average of the results of the initial and confirmation samples of each sampling point.

(iii) If a system has a distribution system that is physically or hydraulically isolated from other parts of the distribution system, only that part of the system that exceeds an MCL shall be deemed out of compliance. The department shall apply the public notice requirement to that portion of the system, which is out of compliance. Public notice shall be effected pursuant to subsection 19-13-B102(i) of the Regulations of Connecticut State Agencies.

(iv) The best available technologies for compliance with the MCL shall conform to those

approved by EPA and specified in 40 CFR 141.61(b), 40 CFR 141.62(c), as amended June 29, 2004, and 40 CFR 141.64(c). Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels is identified as the best means available for achieving compliance with maximum residual disinfectant levels. For surface water and GWUDI systems using conventional treatment, enhanced coagulation or enhanced softening are identified as treatment techniques for controlling disinfection byproduct precursors in drinking water treatment and distribution systems.

(R) Monitoring requirements for systems with a groundwater source under the direct influence of surface water. For a groundwater source under the direct influence of surface water that is required to provide and operate treatment pursuant to section 19-13-B102(j)(2) of the Regulations of Connecticut State Agencies, the department shall be guided by its document entitled, ''Determination Of Groundwater Under The Direct Influence Of Surface Water.'' Interim monitoring requirements shall be required prior to installation of filtration. Specific requirements shall be determined pursuant to subsections (j)(2)(D), (j)(3)(A), (e)(7)(H), and(e)(7)(M) of this section.

(S) Monitoring requirements for systems that use a surface water source or a groundwater source under the direct influence of surface water, and that provide and operate treatment pursuant to section 19-13-B102(j)(2) of the Regulations of Connecticut State Agencies.

(i) Turbidity measurements as required by section 19-13-B102(j)(4) of the Regulations of Connecticut State agencies shall be performed on representative samples of the system's combined filtered water at a point prior to entering a distribution system using a continuous turbidimeter for the time period the filter(s) contribute(s) water to the system, and the system shall record a turbidity result at least every four (4) hours.

Additionally, if a system serves 10,000 or more persons and uses conventional or direct filtration, the system shall perform turbidity measurements on samples representative of effluent water from each individual filter, using a continuous turbidimeter during the time period the filter contributes water to the combined filter water or serves water to the public. The system shall record the turbidity result at least every fifteen (15) minutes during this period.

Additionally, beginning on January 1, 2005, if a system serves fewer than 10,000 persons and uses conventional or direct filtration, the system shall perform turbidity measurements on samples representative of effluent water from each individual filter, using a continuous turbidimeter during the time period the filter contributes water to the combined filter water or serves water to the public. The system shall record the turbidity result at least every fifteen (15) minutes during this period. If the system only consists of two or fewer filters, the system may conduct continuous monitoring of combined filter effluent turbidity in lieu of individual filter effluent turbidity monitoring. Combined filter effluent turbidity monitoring shall meet the same requirements set forth in this subclause.

If there is a failure in the continuous monitoring equipment, grab sampling every four (4) hours shall be conducted in lieu of continuous monitoring, but for no more than five (5) working days following the failure of the equipment for systems serving 10,000 or more persons and for no more than 14 calendar days for systems serving fewer than 10,000 people. A system shall validate the continuous measurement on a daily basis using the

appropriate procedure in the latest edition of ''Standard Methods For The Examination Of Water And Wastewater'' and shall calibrate the turbidimeters using a procedure specified by the equipment manufacturer. A copy of this publication can be obtained by request to the American Public Health Association in Washington, DC. The system shall conduct all turbidity measurements in accordance with a method specified in 40 CFR 141.74(a)(1).

(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 (4) hours may be conducted in lieu of continuous monitoring, but for no more than five (5) working days following the failure of the equipment.

(iii) The residual disinfectant concentration 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 19-13-B102(e)(7) of the Regulations of Connecticut State Agencies. Heterotrophic bacteria, measured as heterotrophic plate count (HPC) as specified in 40 CFR 141.74 (a)(1), may additionally be measured and used in conjunction with the measurement for residual disinfectant concentration when determining compliance pursuant to section 19-13-B102(j)(3)(B)(iii) of the Regulations of Connecticut State Agencies.

(iv) A system serving 10,000 or more persons, having a TTHM annual average of greater than or equal to 0.064 mg/L or a HAA5 annual average of greater than or equal to 0.048 mg/L, shall develop a disinfection profile in accordance with 40 CFR 141.172(b) and submit the disinfection profile pursuant to section 19-13- B102(h)(6)(B)(iv) of the Regulations of Connecticut State Agencies. TTHM and HAA5 annual averages under this subclause, as defined in subsection (a) of this section, shall be based on the monitoring requirement of 40 CFR 141.172(a)(1) through (5) for each respective treatment plant with a surface water source or a groundwater source under the direct influence of surface water. A system shall monitor and calculate logs of inactivation in accordance with 40 CFR 141.172(b) when developing a disinfection profile, and inactivation values achieved by various disinfectants for giardia lamblia cysts and viruses.

(v) A system serving fewer than 10,000 persons, having a TTHM annual average of greater than or equal to 0.064 mg/L or a HAA5 annual average of greater than or equal to 0.048 mg/L, shall develop a disinfection profile in accordance with 40 CFR 141.532, as amended January 14, 2002, 40 CFR 141.533, as amended January 14, 2002, 40 CFR 141.534, as amended January 14, 2002, 40 CFR 141.535, as amended January 14, 2002 and 40 CFR 141.536, as amended January 14, 2002, and submit the disinfection profile pursuant to section 19-13-B102(h)(6)(B)(iv) of the Regulations of Connecticut State Agencies.

TTHM and HAA5 annual averages under this subclause, as defined in subparagraph (a) of this section, shall be based on samples collected, during the month of the warmest water temperature and at the point of maximum residence time in the distribution system for each respective treatment plant with a surface water source or a groundwater source under the direct influence of surface water. A system shall monitor and calculate logs of inactivation in accordance with 40 CFR 141.532, as amended January 14, 2002, 40 CFR 141.533, as amended January 14, 2002, 40 CFR 141.534, as amended January 14, 2002, 40 CFR 141.535, as amended January 14, 2002, and 40 CFR 141.536, as amended January 14, 2002, when developing a disinfection profile, and inactivation values achieved by various

disinfectants for giardia lamblia cysts and viruses.

(T) Enhanced treatment for Cryptosporidium.

(i) General Requirements.

(I) General requirements.

This subparagraph and subsections (h)(9), (i)(5), (j)(12), and (j)(13) of this section establish or extend treatment technique requirements in lieu of MCLs for Cryptosporidium. These requirements are in addition to the requirements for filtration and disinfection in subparagraphs (H), (R), and (S) of this subdivision, subsection (h)(6), and subsections (j)(2) through (j)(4) of this section.

(II) Applicability.

(1) This subparagraph applies to all Subpart H systems.

(2) Wholesale systems shall comply with the requirements of this subparagraph and subsections (h)(9), (i)(5), (j)(12), and (j)(13) of this section based on the population of the largest system in the combined distribution system.

(3)This subparagraph and subsections (h)(9), (i)(5), (j)(12), and (j)(13) of this section apply to systems required by this section to provide filtration treatment, whether or not the system is currently operating a filtration system.

(III) Requirements.

(1) Subpart H systems subject to this subparagraph and subsections (h)(9), (i)(5), (j)(12), and (j)(13) of this section shall comply with the following requirements:

(A) Subpart H systems shall conduct a second round of source water monitoring for each plant that treats a surface water or GWUDI source, or both. This monitoring may include sampling for Cryptosporidium, E. coli, and turbidity as described in clauses (ii) through (vi), inclusive, of this subparagraph and subsection (h)(9) of this section, to determine what level, if any, of additional Cryptosporidium treatment the system shall provide.

(B) Subpart H systems that plan to make a significant change to disinfection practice shall develop disinfection profiles and calculate disinfection benchmarks, as described in clauses (vii) through (viii), inclusive, of this subparagraph.

(C) Subpart H systems shall determine their Cryptosporidium treatment bin classification as described in subsection (j)(12)(A) of this section and provide additional treatment for Cryptosporidium, if required, as described in subsection (j)(12)(B) of this section. Subpart H systems shall implement Cryptosporidium treatment according to the schedule in subsection (j)(12)(C) of this section.

(D) Subpart H systems required to provide additional treatment for Cryptosporidium shall implement microbial toolbox options that are designed and operated as described in subsections (j)(13)(A) through (F) of this section.

(E) Subpart H systems shall comply with the applicable recordkeeping and reporting requirements described in subsections (h)(9)(B) through (E) and (l)(1)(R) through (T) of this section.

(F) Subpart H systems shall address significant deficiencies identified in sanitary surveys performed by the department as described in subparagraph (E) of this subdivision.

(ii) Source water monitoring requirements.

(I) Second round of source water monitoring. A Subpart H system shall conduct a second round of source water monitoring that meets the requirements for monitoring parameters,

frequency, and duration described in 40 CFR 141.701(a), as amended from time to time, unless the Subpart H system meets the monitoring exemption criteria in subclause (III) of this clause. A Subpart H system shall conduct this monitoring on the schedule in subclause (II) of this clause.

(II) Monitoring schedule. A Subpart H system shall commence the second round of monitoring required in subclause (I) of this clause not later than the month beginning with the date listed in Table 7-T1 of this subclause:

TABLE 7-T1. SOURCE WATER MONITORING STARTING DATES

Subpart H systems that serve…	Shall begin the second round of source water monitoring required under subsection (e)(7)(T)(ii)(I) of this section not later than the month beginning…
(1) At least 100,000 people…	April 1, 2015
(2) From 50,000 to 99,999 people…	October 1, 2015
(3) From 10,000 to 49,999 people…	October 1, 2016
(4) Fewer than 10,000 and monitor for E. coli…	October 1, 2017
(5) Fewer than 10,000 and monitor for Cryptosporidium[1] …	April 1, 2019

[1] Applies to Subpart H systems that meet the conditions of 40 CFR 141.701(a)(4), as amended from time to time.

(III) Monitoring avoidance.

(1) A Subpart H system is not required to conduct source water monitoring under this subparagraph if it 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 (j)(12)(B) of this section, and obtains a monitoring exemption from the department. In order to obtain a monitoring exemption, the Subpart H system shall submit an application to the department requesting such exemption in accordance with subsection (t) of this section and shall include with the application documentation demonstrating that it 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 (j)(12)(B) of this section. Such application shall be submitted to the department not later than the date on which the Subpart H system is required to submit a sampling schedule for monitoring under clause (iii) of this subparagraph.

(2) Alternatively, a Subpart H system may stop sampling at any point after it has initiated monitoring if the Subpart H system submits an application to the department requesting approval to provide a total of at least 5.5-log of treatment for Cryptosporidium, equivalent to meeting the treatment requirements of Bin 4 in subsection (j)(12)(B) of this section by the applicable treatment compliance date in subsection (j)(12)(C) of this section, and the department grants such approval. Such application shall be submitted in accordance with subsection (t) of this section and shall include with the application documentation demonstrating that the Subpart H system will install and operate technologies to provide this level of treatment by the applicable compliance date in subsection (j)(12)(C) of this

section. Subpart H systems shall install and operate technologies to provide this level of treatment by the applicable treatment compliance date in subsection (j)(12)(C) of this section.

(IV) Plants operating only part of the year. A Subpart H system with a surface water or GWUDI treatment plant that operates for only part of the year shall conduct source water monitoring in accordance with this subparagraph, but with the modifications in subclauses (IV)(1) and (2) of this clause. For purposes of this subclause, a Subpart H system operates for only part of the year if the Subpart H system is in operation for less than 12 months out of a year.

(1) A Subpart H system shall sample its source water only during the months that the plant operates unless the department specifies in writing another monitoring period based on plant operating practices.

(2) A Subpart H system with a surface water or GWUDI treatment plant that operates less than 6 months per year and that monitors for Cryptosporidium shall collect at least 6 Cryptosporidium samples per year during each of 2 years of monitoring. Samples shall be evenly spaced throughout the period the plant operates.

(V) New sources.

(1) A Subpart H system that begins using a new source of surface water or GWUDI shall monitor the new source on a schedule approved by the department. Source water monitoring shall meet the requirements of this subparagraph. The Subpart H system shall also meet the bin classification and Cryptosporidium treatment requirements of subsections (j)(12)(A) and (B) of this section for the new source on a schedule approved by the department. To request approval of the new source's monitoring schedules, the Subpart H system shall submit an application to the department requesting approval of the schedules on which it shall monitor its new source and meet the bin classification and Cryptosporidium treatment requirements for the new source. Such application shall be submitted in accordance with subsection (t) of this section.

(2) The Subpart H system shall begin a second round of source water monitoring not later than 6 years after initial bin classification under subsection (j)(12)(A) of this section.

(VI) Failure to collect any source water sample required under this clause in accordance with the sampling schedule, sampling location, analytical method, approved laboratory, and reporting requirements of clauses (iii) through (vi), inclusive, of this subparagraph is a monitoring violation.

(iii) Sampling Schedules.

(I) A Subpart H system that is required to conduct source water monitoring under clause (ii) of this subparagraph shall submit an application to the department requesting approval of the sampling schedule that specifies the calendar dates when they will collect each required sample. Such application shall be submitted in accordance with subsection (t) of this section.

(II) A Subpart H system shall submit sampling schedules not later than 3 months prior to the applicable date in clause (ii)(II) of this subparagraph for the second round of sampling.

(III) A Subpart H system shall collect samples within 2 days before or 2 days after the dates indicated in the department-approved sampling schedule (i.e., within a 5-day period around the schedule date) unless 1 of the following conditions applies:

(1)If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided and causes the Subpart H system to be unable to sample in the scheduled 5-day period, the Subpart H system shall sample as close to the scheduled date as is feasible unless the department approves an alternate sampling date. If the Subpart H system samples as close to the sampled date as is feasible, it shall submit an explanation for the delayed sample to the department concurrent with the shipment of the sample to the laboratory. If, instead, the Subpart H system wants to use an alternate sampling date, it shall submit an application to the department not later than 2 calendar days after the date on which it was required to collect the sample requesting approval of an alternative sampling date. Such application shall include the reason or reasons for requesting the alternative sampling date, including the reason or reasons for the delay in sampling, and shall be submitted in accordance with subsection (t) of this section.

(2)(A) If a Subpart H 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 clause (v) of this subparagraph, or the failure of an approved laboratory to analyze the sample, then the Subpart H system shall collect a replacement sample.

(B) The Subpart H system shall collect the replacement sample not later than 21 days after receiving information that an analytical result cannot be reported for the scheduled date unless it demonstrates that collecting a replacement sample within this time frame is not feasible or the department approves an alternate sampling date. If it is not feasible for the Subpart H system to collect a replacement sample within the required timeframe, then the Subpart H system shall submit an explanation for the delayed sampling date to the department concurrent with the shipment of the sample to the laboratory. If instead the Subpart H system wants to use an alternate sampling date, then the Subpart H system shall submit an application to the department requesting approval of an alternative sampling date not later than 2 calendar days after the date by which it was required to collect the sample. Such application shall include the reason or reasons for requesting the alternative sampling date, including the reason or reasons for the delay in sampling, and shall be submitted in accordance with subsection (t) of this section.

(IV) A Subpart H system that fails to meet the criteria of subclause (III) of this clause for any source water sample required under clause (ii) of this subparagraph shall revise the Subpart H system's sampling schedules to add dates for collecting all missed samples. The Subpart H system shall submit an application to the department requesting approval of the revised schedule. Such application shall include the reason or reasons for requesting to use the revised schedule and shall be submitted in accordance with subsection (t) of this section. The application shall be submitted to the department prior to the time the Subpart H system begins collecting the missed samples.

(iv) Sampling locations.

(I) A Subpart H system that is required to conduct source water monitoring under clause (ii) of this subparagraph shall 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 department may approve 1 set of monitoring results to be used to satisfy the requirements of clause (ii) of this subparagraph for all plants. To receive such

approval, the Subpart H system shall submit an application to the department requesting approval of the use of 1 set of monitoring results to be used to satisfy the requirements of clause (ii) of this subparagraph for all plants. Such application shall include the reason or reasons for requesting approval of 1 set of monitoring results, including documentation demonstrating that the plants draw water from the same influent, and shall be submitted in accordance with subsection (t) of this section.

(II) A Subpart H system shall collect source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants, unless the department approves a Subpart H system to collect a source water sample after chemical treatment. To request such approval, the Subpart H system shall submit an application to the department in accordance with subsection (t) of this section. Such application shall include the reason or reasons for requesting to collect a sample after chemical treatment instead of before chemical treatment, including documentation demonstrating that the collection of a sample prior to chemical treatment is not feasible for the Subpart H system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample. The department shall not grant an approval unless the department determines that the collecting of a sample prior to chemical treatment is not feasible for the Subpart H system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

(III) A Subpart H system that recycles filter backwash water shall collect source water samples prior to the point of the filter backwash water addition.

(IV) Bank filtration.

(1) Systems supplied by a surface water source that receive Cryptosporidium treatment credit for bank filtration under subsection (j)(4)(D) of this section shall collect source water samples in the surface water prior to bank filtration.

(2) Systems supplied by a GWUDI source that use bank filtration as pretreatment to a filtration plant shall collect source water samples from the well (i.e., after bank filtration). Use of bank filtration during monitoring shall be consistent with routine operational practice. Subpart H systems collecting samples after a bank filtration process shall not receive treatment credit for the bank filtration under subsection (j)(13)(C)(iii) of this section.

(V) Multiple sources. Subpart H systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and ground water sources, shall collect samples as specified in subclause (V)(1) or (2) of this clause. The use of multiple sources during monitoring shall be consistent with routine operational practice.

(1) If a sampling tap is available where the sources are combined prior to treatment, Subpart H systems shall collect samples from the tap.

(2) If a sampling tap where the sources are combined prior to treatment is not available, Subpart H systems shall collect samples at each source near the intake on the same day and shall follow the requirements in either subclause (V)(2)(A) or (B) of this clause for sample analysis.

(A) Subpart H systems may composite samples from each source into 1 sample prior to analysis. The volume of sample from each source shall be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

(B) Subpart H systems may analyze samples from each source separately and calculate a weighted average of the analysis results for each sampling date. The weighted average

shall 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.

(VI) Additional Requirements. A Subpart H system shall submit an application to the department in accordance with subsection (t) of this section requesting approval of its sampling locations. The Subpart H system shall provide with its application a description of the sampling location, and the position of the sampling location in relation to its water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle. Such application shall be submitted to the department at the same time as the sampling schedule required under clause (iii) of this subparagraph. The Subpart H system shall not sample at the locations reported in the application until it receives approval from the department to do so.

(v) Analytical methods.

(I) Cryptosporidium. Subpart H systems shall analyze for Cryptosporidium using analytical methods approved by EPA in 40 CFR 141.704(a), as amended from time to time.

(II) E. coli. Subpart H systems shall use the methods for enumeration of E. coli in source water approved by EPA in 40 CFR 141.704(b), as amended from time to time.

(III) Turbidity. Subpart H systems shall use methods for turbidity measurement approved by EPA in 40 CFR 141.704(c), as amended from time to time.

(vi) Approved laboratories.

(I) Cryptosporidium. Subpart H systems shall have Cryptosporidium samples analyzed by a laboratory that is approved under the EPA's Laboratory Quality Assurance Evaluation Program for Analysis of Cryptosporidium in Water or a laboratory approved by the department pursuant to section 19a-29a of the Connecticut General Statutes for Cryptosporidium analysis.

(II) E. coli. Any laboratory certified by the EPA or the National Environmental Laboratory Accreditation Conference, or approved by the department pursuant to section 19a-29a of the Connecticut General Statutes, for total coliform or fecal coliform analysis, is approved for E. coli analysis under this subparagraph and subsections (h)(9), (i)(5), (j)(12), and (j)(13) of this section when the laboratory uses the same technique for E. coli that the laboratory uses for 40 CFR 141.74, as amended from time to time.

(III) Turbidity. Measurements of turbidity shall be made by a laboratory that has a certificate of approval issued by the department pursuant to section 19a-29a of the Connecticut General Statutes.

(vii) Requirements when making a significant change in disinfection practice. Subpart H systems that plan to make a significant change to disinfection practice shall develop disinfection profiles and calculate disinfection benchmarks for Giardia lamblia and viruses as described in clause (viii) of this subparagraph. Prior to making a significant change to disinfection practice, the Subpart H system shall submit an application to the department requesting approval to make a significant change to disinfection practice. Such application shall be submitted in accordance with subsection (t) of this section. The application shall include the following information:

(I) A completed disinfection profile and disinfection benchmark for Giardia lamblia and viruses as described in clause (viii) of this subparagraph.

(II) A description of the proposed significant change to disinfection practice.

(III) An analysis of how the proposed significant change to disinfection practice will affect the current level of disinfection.

(viii) Developing the disinfection profile and benchmark.

(I) Subpart H systems required to develop disinfection profiles under clause (vii) of this subparagraph shall follow the requirements of this clause. Subpart H systems shall monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for Giardia lamblia and viruses. If Subpart H systems monitor more frequently, the monitoring frequency shall be evenly spaced. Subpart H systems that operate for fewer than 12 months per year shall monitor weekly during the period of operation. Subpart H systems shall determine log inactivation for Giardia lamblia through the entire plant, based on CT99.9 values in Tables 1.1 through 1.6, 2.1 and 3.1 of 40 CFR 141.74(b), as amended from time to time, as applicable. Subpart H systems shall determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the department under subclause (IV)(4) of this clause.

(II) Subpart H systems with a single point of disinfectant application prior to the entrance to the distribution system shall conduct the monitoring in subclauses (II)(1) through (4), inclusive, of this clause. Subpart H systems with more than 1 point of disinfectant application shall conduct the monitoring in subclauses (II)(1) through (4), inclusive, of this clause for each disinfection segment. Subpart H systems shall monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in 40 CFR 141.74(a), as amended from time to time.

(1) For Subpart H systems using a disinfectant other than UV, the temperature of the disinfected water shall be measured at each RDC sampling point during peak hourly flow or at an alternative location approved by the department. To request approval to measure the temperature of the disinfected water at an alternative location, the Subpart H system shall submit an application to the department requesting approval of such alternative location in accordance with subsection (t) of this section.

(2) For Subpart H systems using chlorine, the pH of the disinfected water shall be measured at each chlorine RDC sampling point during peak hourly flow or at an alternative location approved by the department. To request approval to measure the pH of the disinfected water at an alternative location, the Subpart H system shall submit an application to the department requesting approval of such alternative location in accordance with subsection (t) of this section.

(3) The disinfectant contact time(s) shall be determined during peak hourly flow.

(4) The RDC(s) of the water before or at the first consumer and prior to each additional point of disinfectant application shall be measured during peak hourly flow.

(III) In lieu of conducting new monitoring under subclause (II) of this clause, Subpart H systems may elect to meet the requirements of subclause (III)(1) or (2) of this clause. The Subpart H system shall submit an application to the department requesting approval to meet the requirements of subclause (III)(1) or (2) of this clause in lieu of conducting new monitoring under subclause (II) of this clause in accordance with subsection (t) of this section.

(1) A Subpart H system that has at least 1 year of existing data that are substantially

equivalent to data collected under the provisions of subclause (II) of this clause may use these data to develop disinfection profiles as specified in subclause (III) of this clause if the Subpart H system has neither made a significant change to the Subpart H system's treatment practice nor changed sources since the data were collected. A Subpart H system may develop disinfection profiles using up to 3 years of existing data.

(2) A Subpart H system may use disinfection profile(s) developed under subparagraphs (S)(iv) and (v) of this subdivision in lieu of developing a new profile if the Subpart H system has neither made a significant change to the treatment practice of the Subpart H system, nor changed sources since the profile was developed. A Subpart H system that has not developed a disinfection profile under subparagraph (S)(iv) or (v) of this subdivision shall develop a disinfection profile using the same monitoring data on which the Giardia lamblia profile is based.

(IV) Subpart H systems shall calculate the total inactivation ratio for Giardia lamblia as specified in subclauses (IV)(1) through (3), inclusive, of this clause.

(1) Subpart H systems using only 1 point of disinfectant application may determine the total inactivation ratio for the disinfection segment based on the following methods.

(A) Determine 1 inactivation ratio (CTcalc/CT99.9) before or at the first consumer during peak hourly flow; or

(B) Determine successive CTcalc/CT99.9 values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first consumer during peak hourly flow. The Subpart H system shall calculate the total inactivation ratio by determining (CTcalc/CT99.9) for each sequence and then adding the (CTcalc/CT99.9) values together to determine (Σ (CTcalc/CT99.9)).

(2) Subpart H systems using more than 1 point of disinfectant application before the first consumer shall 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 consumer, during peak hourly flow. The (CTcalc/CT99.9) value of each segment and (Σ (CTcalc/CT99.9)) shall be calculated using the method in subclause (IV)(1)(B) of this clause.

(3) Subpart H systems shall determine the total logs of inactivation by multiplying the value calculated in subclause (IV)(1)(A) or (B) of this clause by 3.0.

(4) Subpart H systems shall calculate the log of inactivation for viruses using a protocol approved by the department. To request approval of a protocol, a Subpart H system shall submit an application to the department in accordance with subsection (t) of this section. The application shall include the proposed protocol that the Subpart H system will use to calculate the total logs of inactivation.

(V) Subpart H systems shall use the procedures specified in subclauses (V)(1) and (2) of this clause to calculate a disinfection benchmark.

(1) For each year of profiling data collected and calculated under subclauses (I) through (IV), inclusive, of this clause, Subpart H systems shall determine the lowest mean monthly level of both Giardia lamblia and virus inactivation. Subpart H systems shall 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.

(2) The disinfection benchmark is the lowest monthly mean value (for Subpart H systems with 1 year of profiling data) or the mean of the lowest monthly mean values (for Subpart H systems with more than 1 year of profiling data) of Giardia lamblia and virus log inactivation in each year of profiling data.

(8) Monitoring requirements for lead and copper in tap water. Unless otherwise indicated, the provisions of this subdivision shall apply to CWSs and NTNCs.

(A) Sample site location.

(i) Each CWS or NTNC shall complete a materials evaluation of the CWS's or NTNC's distribution system in order to identify a pool of targeted sampling sites that meets the requirements of this subdivision, and that is sufficiently large to ensure that the CWS or NTNC can collect the number of lead and copper tap water samples required in subparagraph (C) of this subdivision. All sites from which first-draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites shall not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(ii) A CWS or NTNC shall use the information on lead, copper, and galvanized steel that the CWS or NTNC is required to collect under 40 CFR 141.42(d) (special monitoring for corrosivity characteristics), as amended from time to time, when conducting a materials evaluation. When an evaluation of the information collected pursuant to 40 CFR 141.42(d), as amended from time to time, is insufficient to locate the requisite number of lead and copper sampling sites to meet the targeting criteria of this subparagraph, the CWS or NTNC shall review the sources of information listed in subclauses (I) through (III), inclusive, of this clause in order to identify a sufficient number of sampling sites. In addition, the CWS or NTNC shall collect such information where possible in the course of the CWS's or NTNC's normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities):

(I) All plumbing codes, permits, and records in the files of the building department(s) that indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system;

(II) All inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and

(III) All existing water quality information, which includes the results of all prior analyses of the CWS or NTNC or individual structures connected to the CWS or NTNC, indicating locations that may be particularly susceptible to high lead or copper concentrations.

(iii) The sampling sites selected for a CWS's sampling pool (tier 1 sampling sites) shall consist of single family structures that:

(I) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) Are served by a lead service line. When multiple-family residences comprise at least 20 percent of the structures served by a CWS, the CWS may include this type of structure in the CWS's sampling pool.

(iv) Any CWS with insufficient tier 1 sampling sites shall complete the CWS's sampling pool with tier 2 sampling sites, consisting of buildings, including multiple-family residences

that:

(I) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) Are served by a lead service line.

(v) Any CWS with insufficient tier 1 and tier 2 sampling sites shall complete the CWS's sampling pool with tier 3 sampling sites, consisting of single family structures that contain copper pipes with lead solder installed before 1983. A CWS with insufficient tier 1, tier 2, and tier 3 sampling sites shall complete the CWS's sampling pool with representative sites throughout the distribution system. For the purpose of this subclause, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the CWS.

(vi) The sampling sites selected for a NTNC (tier 1 sampling sites) shall consist of buildings that:

(I) Contain copper pipes with lead solder installed after 1982 or contain lead pipes; or

(II) Are served by a lead service line; or

(III) Contain copper pipes with lead solder installed after 1982 or contain lead pipes and are served by a lead service line.

(vii) A NTNC with insufficient tier 1 sites to meet the targeting criteria in clause (vi) of this subparagraph shall complete the NTNC's sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the NTNC shall use representative sites throughout the distribution system. For the purpose of this subclause, a representative site is a site in which the plumbing materials used at that site would be commonly found at other sites served by the NTNC.

(viii) Any CWS or NTNC having a distribution system containing lead service lines shall draw 50 percent of the samples the CWS or NTNC collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of those samples from sites served by a lead service line. A CWS or NTNC that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first-draw samples from all of the sites identified as being served by such lines.

(B) Sample collection methods.

(i) All tap water samples for lead and copper collected in accordance with this subdivision, with the exception of lead service line samples collected under clauses (iii) and (v) of this subparagraph, shall be first-draw samples.

(ii) Each first-draw tap water sample for lead and copper shall be 1 liter in volume and have stood motionless in the plumbing system of each sampling site for at least 6 hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a non-residential building shall be 1 liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to clause (v) of this subparagraph shall be 1 liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the CWS or NTNC or the CWS or NTNC may allow residents to collect first-draw samples after instructing the residents of the sampling procedures specified in this subparagraph. To avoid problems of residents handling nitric acid, acidification of first-

draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample shall stand in the original container for the time specified in the approved EPA method, pursuant to subdivision (7)(K) of this subsection, before the sample is analyzed. If a CWS or NTNC allows a resident to perform sampling, the CWS or NTNC may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

(iii) Each service line sample shall be 1 liter in volume and have stood motionless in the lead service line for at least 6 hours. Lead service line samples shall be collected in 1 of the following 3 ways:

(I) At the tap after flushing the volume of water between the tap and the lead service line (the volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line);

(II) Tapping directly into the lead service line; or

(III) If the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

(iv) A CWS or NTNC shall collect each first-draw tap water sample from the same sampling site from which the CWS or NTNC collected a previous sample. If the CWS or NTNC cannot gain entry to a sampling site in order to collect a follow-up tap water sample, the CWS or NTNC may collect the follow-up tap water sample from another sampling site in the CWS's or NTNC's sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

(v) A NTNC, or a CWS whose operation mandates continuous daily flow, such as a prison or hospital, that does not have enough taps that can supply first-draw samples, as defined in subsection (a) of this section, shall notify the department in writing when the CWS or NTNC substitutes non-first-draw samples pursuant to subsection (h)(5)(A)(vii) of this section. Such CWSs and NTNCs shall collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites.

(C) Number of lead and copper tap water samples. CWSs and NTNCs shall collect at least 1 sample during each monitoring period specified in subparagraph (D) of this subdivision from the number of sites listed in the second column ("Standard Monitoring") in Table 8-C1 of this subparagraph. A CWS or NTNC conducting reduced monitoring under subparagraph (D)(iv) of this subdivision shall collect at least 1 sample from the number of sites specified in the third column ("Reduced Monitoring") in Table 8-C1 of this subparagraph during each monitoring period specified in subparagraph (D)(iv) of this subdivision. Such reduced monitoring sites shall be representative of the sites required for standard monitoring.

TABLE 8-C1. LEAD AND COPPER MONITORING SAMPLING SITES

CWS or NTNC Size (Number of People Served)	Number of Sites (Standard Monitoring)	Number of Sites (Reduced Monitoring)
Greater than 100,000	100	50

10,001-100,000	60	30
3,301 to 10,000	40	20
501 to 3,300	20	10
101 to 500	10	5
Less than or equal to 100	5	5

(i) A CWS or NTNC that has fewer than 5 drinking water taps that can be used for human consumption meeting the sample site criteria of subparagraph (A) of this subdivision to reach the required number of sample sites listed in subparagraph (C) of this subdivision, shall collect at least 1 sample from each tap and then shall collect additional samples from those taps on different days during the monitoring period to meet the required number of sites.

(ii) Alternatively, the CWS or NTNC may submit to the department an application requesting that the department approve the CWS or NTNC to collect a number of samples less than the number of sites specified in Table 8-C1 of this subparagraph provided that 100 percent of all taps that can be used for human consumption are sampled. Such application shall include the reason or reasons that the CWS or NTNC is requesting to collect a number of samples less than the number of sites specified in Table 8-C1 of this subparagraph and shall be submitted in accordance with subsection (t) of this section.

(iii) The department may specify sampling locations when a CWS or NTNC is conducting reduced monitoring.

(D) Timing of monitoring.

(i) Initial tap water sampling.

(I) All large CWSs and NTNCs shall monitor during 2 consecutive 6 month periods.

(II) All small and medium-size CWSs and NTNCs shall monitor during each 6 month monitoring period until:

(1) The CWS or NTNC exceeds the lead or copper action level and is therefore required to implement the corrosion control treatment requirements under subsection (j)(7) of this section, in which case the CWS or NTNC shall continue monitoring in accordance with clause (ii) of this subparagraph, or

(2) The CWS or NTNC meets the lead and copper action levels during 2 consecutive 6 month monitoring periods, in which case the CWS or NTNC may reduce monitoring in accordance with clause (iv) of this subparagraph.

(ii) Monitoring after installation of corrosion control and source water treatment.

(I) Any CWS or NTNC that installs optimal corrosion control treatment pursuant to subsection (j)(7)(D)(v) of this section shall monitor during 2 consecutive 6 month monitoring periods in accordance with the time period described in subsection (j)(7)(D)(vi) of this section.

(II) Any CWS or NTNC that installs source water treatment pursuant to subsection (j)(9)(A)(iii) of this section shall monitor during 2 consecutive 6 month monitoring periods in accordance with the time period described in subsection (j)(9)(A)(iv) of this section.

(iii) Monitoring after the department specifies water quality parameter values for optimal corrosion control. After the department specifies the values for water quality control

parameters under subsection (j)(8)(F) of this section, the CWS or NTNC shall monitor during each subsequent 6 month monitoring period, with the first monitoring period to begin on the date the department specifies the optimal values under subsection (j)(8)(F) of this section.

(iv) Reduced monitoring.

(I) A small or medium-size CWS or NTNC that meets the lead and copper action levels during each of 2 consecutive 6 month monitoring periods may reduce the number of samples in accordance with subparagraph (C) of this subdivision, and reduce the frequency of sampling to once per year. A small or medium CWS or NTNC collecting fewer than 5 samples as specified in subparagraph (C)(i) of this subdivision that meets the lead and copper action levels during each of 2 consecutive 6 month monitoring periods may reduce the frequency of sampling to once per year. In no case shall the CWS or NTNC reduce the number of samples required below the minimum of 1 sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive 6 month monitoring period.

(II) Any CWS or NTNC that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under subsection (j)(8)(F) of this section during each of 2 consecutive 6 month monitoring periods may reduce the frequency of monitoring to once per year and reduce the number of lead and copper samples in accordance with subparagraph (C) of this subdivision if the CWS or NTNC submits to the department an application requesting approval to do so and receives such approval in writing from the department. Such application shall include the reason or reasons that the CWS or NTNC is requesting to reduce the frequency of monitoring and the number of lead and copper samples and shall be submitted in accordance with subsection (t) of this section. This sampling shall begin during the calendar year immediately following the end of the second consecutive 6 month monitoring period after the department's approval of such application. The department shall review monitoring, treatment and other relevant information submitted by the CWS or NTNC in accordance with subsection (h)(5) of this section and shall notify the CWS or NTNC in writing when the department determines the CWS or NTNC is eligible to commence reduced monitoring pursuant to this subclause. The department shall review, and where appropriate, revise the department's determination when the CWS or NTNC submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap water sampling becomes available.

(III) A small or medium-size CWS or NTNC that meets the lead and copper action levels during 3 consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every 3 years. Any CWS or NTNC that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under subsection (j)(8)(F) of this section during 3 consecutive years of monitoring may reduce the frequency of monitoring from annually to once every 3 years if the CWS or NTNC submits to the department an application requesting approval to do so and receives such approval in writing from the department. Such application shall include the reason or reasons that the CWS or NTNC is requesting to reduce the frequency of monitoring and shall be submitted in

accordance with subsection (t) of this section. Samples collected once every 3 years shall be collected not later than every third calendar year after the department's approval of such application. The department shall review monitoring, treatment, and other relevant information submitted by the CWS or NTNC in accordance with subsection (h)(5) of this section, and shall notify the CWS or NTNC in writing when the department determines the CWS or NTNC is eligible to reduce the frequency of monitoring to once every 3 years. The department shall review, and where appropriate, revise the department's determination when the CWS or NTNC submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap water sampling becomes available.

(IV) A CWS or NTNC that reduces the number and frequency of sampling shall collect these samples from representative sites included in the pool of targeted sampling sites identified in subparagraph (A) of this subdivision. CWSs and NTNCs sampling annually or less frequently shall conduct the lead and copper tap water sampling during the months of June, July, August, or September unless the department has approved a different sampling period in accordance with this clause.

(1) The department may approve a different period for conducting the lead and copper tap water sampling for CWSs and NTNCs collecting a reduced number of samples. Such a period shall be no longer than 4 consecutive months and shall represent a time of normal operation when the highest levels of lead are most likely to occur. For a NTNC that does not operate during the months of June through September, and for which the period of normal operation when the highest levels of lead are most likely to occur is not known, the department shall designate, in writing, a period that represents a time of normal operation for the NTNC. This sampling shall begin during the period designated by the department in the calendar year immediately following the end of the second consecutive 6 month monitoring period for CWSs and NTNCs initiating annual monitoring and during the 3 year period following the end of the third consecutive calendar year of annual monitoring for CWSs and NTNCs initiating triennial monitoring.

(2) CWSs and NTNCs monitoring annually, that have been collecting samples during the months of June through September and that receive department approval to alter the CWS's or NTNC's sample collection period under this clause, shall collect the CWS's or NTNC's next round of samples during a time period that ends not later than 21 months after the previous round of sampling. CWSs and NTNCs monitoring once every 3 calendar years that have been collecting samples during the months of June through September, and that receive department approval to alter the CWS's or NTNC's sampling collection period under this clause, shall collect the CWS's or NTNC's next round of samples during a time period that ends not later than 45 months after the previous round of sampling. Subsequent rounds of sampling shall be collected annually or once every 3 calendar years, as required by this subdivision.

(V) Any CWS or NTNC that demonstrates for 2 consecutive 6 month monitoring periods that the tap water lead level computed under subsection (j)(6)(B)(iii) of this section is less than or equal to 0.005 mg/l and the tap water copper level computed under subsection (j)(6)(B)(iii) of this section is less than or equal to 0.65 mg/l may reduce the number of samples in accordance with subparagraph (C) of this subdivision and reduce the frequency of sampling to once every 3 calendar years.

(VI)

(1) A small or medium-size CWS or NTNC subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling in accordance with clause (iii) of this subparagraph and collect the number of samples specified for standard monitoring under subparagraph (C) of this subdivision. Such CWS or NTNC shall also conduct water quality parameter monitoring in accordance with subdivision (9)(B), (C) or (D) of this subsection (as appropriate) during the designated 4 consecutive month monitoring period in which the CWS or NTNC exceeded the action level. Any such CWS or NTNC may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subparagraph (C) of this subdivision after the CWS or NTNC has completed 2 subsequent consecutive 6 month rounds of monitoring that meet the criteria of subclause (I) of this clause and may resume monitoring once every 3 calendar years for lead and copper at the reduced number of sites after the CWS or NTNC demonstrates through subsequent rounds of monitoring that the CWS or NTNC meets the criteria of either subclause (III) or (V) of this clause.

(2) Any CWS or NTNC subject to the reduced monitoring frequency that fails to meet the lead action level during any 4 consecutive month monitoring period or that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the department under subsection (j)(8)(F) of this section for more than 9 days in any 6 month period specified in subdivision (9)(D) of this subsection shall conduct tap water sampling for lead and copper at the frequency specified in clause (iii) of this subparagraph, collect the number of samples specified for standard monitoring subparagraph (C) of this subdivision, and shall resume monitoring for water quality parameters within the distribution system in accordance with subdivision (9)(D) of this subsection. This standard tap water sampling shall begin not later than the 6 month period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion. Such a CWS or NTNC may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions in subclause (VI)(2)(A), (B) and (C) of this clause:

(A) The CWS or NTNC may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in subparagraph (C) of this subdivision after the CWS or NTNC has completed 2 subsequent 6 month rounds of monitoring that meet the criteria of subclause (II) of this clause and the CWS or NTNC has received written approval from the department that it is appropriate to resume reduced monitoring on an annual frequency. Sampling shall begin during the calendar year immediately following the end of the second consecutive 6 month monitoring period.

(B) The CWS or NTNC may resume monitoring once every 3 calendar years for lead and copper at the tap at the reduced number of sites after the CWS or NTNC demonstrates through subsequent rounds of monitoring that the CWS or NTNC meets the criteria of either subclause (III) or (V) of this clause and the CWS or NTNC has received written approval from the department that it is appropriate to resume monitoring once every 3 calendar years.

(C) The CWS or NTNC may reduce the number of water quality parameter tap water samples required in accordance with subdivision (9)(E)(i) of this subsection and the frequency with which the CWS or NTNC collects such samples in accordance with

subdivision (9)(E)(ii) of this subsection. Such a CWS or NTNC shall not resume monitoring once every 3 calendar years for water quality parameters at the tap until the CWS or NTNC demonstrates, in accordance with the requirements of subdivision (9)(E)(ii) of this subsection, that the CWS or NTNC has re-qualified for monitoring once every 3 calendar years.

(VII) Any CWS or NTNC subject to a reduced monitoring frequency under this clause shall obtain approval from the department in writing in accordance with subsection (h)(5)(A)(iii) of this section of any upcoming long-term change in treatment or the addition of a new source as described in subsection (h)(5)(A)(iii) of this section. The department shall review and approve such long-term change in treatment or addition of a new source under subsection (h)(5)(A)(iii) of this section before the CWS or NTNC may implement it. The department may require the CWS or NTNC to resume routine sampling in accordance with clause (iii) of this subparagraph and collect the number of samples specified for standard monitoring under subparagraph (C) of this subdivision or take other appropriate steps, such as increased water quality parameter monitoring or re-evaluation of the CWS's or NTNC's corrosion control treatment given the potentially different water quality considerations.

(E) Additional monitoring by CWSs and NTNCs. The results of any monitoring conducted in addition to the minimum requirements of this subdivision shall be considered by the CWS or NTNC and the department in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subdivision and subsections (e)(7)(K), (e)(9) and (e)(10), (h)(5), (i)(6), (j)(6) through (j)(10), and (l)(1) of this section.

(F) Invalidation of lead or copper tap water samples. A sample invalidated under this subparagraph does not count toward determining lead or copper 90th percentile levels under subsection (j)(6)(B)(iii) of this section or toward meeting the minimum monitoring requirements of subparagraph (C) of this subdivision.

(i) The department may invalidate a lead or copper tap water sample if at least 1 of the following conditions is met:

(I) The laboratory establishes that improper sample analysis caused erroneous results;

(II) The department determines that the sample was taken from a site that did not meet the site selection criteria of this subdivision;

(III) The sample container was damaged in transit; or

(IV) There is substantial reason to believe that the sample was subject to tampering.

(ii) The CWS or NTNC shall report the results of all samples to the department and all supporting documentation for samples the CWS or NTNC believes should be invalidated.

(iii) To invalidate a sample under this subparagraph, the department shall document, in writing, the department's decision and the rationale for the decision. The department shall not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

(iv) The CWS or NTNC shall collect replacement samples for any samples invalidated under this subparagraph if, after the invalidation of 1 or more samples, the CWS or NTNC has too few samples to meet the minimum requirements of subparagraph (C) of this subdivision. Any such replacement samples shall be taken as soon as possible, but not later than 20 days after the date the department invalidates the sample or by the end of the

applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

(G) Supplemental monitoring and notification of results. A CWS or NTNC that fails to meet the lead action level on the basis of tap water samples collected in accordance with this subdivision shall offer to sample the tap water of any consumer who requests it. The CWS or NTNC is not required to pay for collecting or analyzing the lead tap water sample, nor is the CWS or NTNC required to collect and analyze the sample itself.

(9) Monitoring requirements for water quality parameters. All large CWSs and NTNCs and all small and medium-size CWSs and NTNCs that exceed the lead or copper action level shall monitor water quality parameters in addition to lead and copper in accordance with this subdivision. The requirements of this subdivision are summarized in Table 9-E3 of this subdivision. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) General requirements.

(i) Sample collection methods. Tap water samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the CWS or NTNC, and seasonal variability. Tap water sampling under this subdivision is not required to be conducted at taps targeted for lead and copper sampling under subdivision (8)(A)(i) of this subsection. Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a CWS or NTNC draws water from more than 1 source and the sources are combined before distribution, the CWS or NTNC shall 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).

(ii) Number of samples. CWSs and NTNCs shall collect 2 tap water samples for applicable water quality parameters during each monitoring period specified under subparagraphs (B) through (E), inclusive, of this subdivision from the following number of sites in Table 9-E1 of this clause.

TABLE 9-E1. NUMBER OF WATER QUALITY PARAMETER SAMPLES FOR LEAD AND COPPER

Size of CWS or NTNC(Number of People Served)	*Number of Sites for Water Quality Parameters*
Greater than 100,000	25
10,001 to 100,000	10
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
Less than or equal to 100	1

CWSs and NTNCs shall collect 2 samples for each applicable water quality parameter at

each entry point to the distribution system during each monitoring period specified in subparagraph (B) of this subdivision. During each monitoring period specified in subparagraphs (C) through (E), inclusive, of this subdivision, CWSs and NTNCs shall collect 1 sample for each applicable water quality parameter at each entry point to the distribution system.

(B) Initial sampling. All large CWSs and NTNCs shall measure the applicable water quality parameters as specified in this subparagraph at taps and at each entry point to the distribution system during each 6 month monitoring period specified in subdivision (8)(D) of this subsection. All small and medium-size CWSs and NTNCs shall measure the applicable water quality parameters at the locations specified in this subparagraph during each 6 month monitoring period specified in subdivision (8)(D) of this subsection during which the CWS or NTNC exceeds the lead or copper action level.

(i) Monitoring at taps shall include:

(I) pH;

(II) Alkalinity;

(III) Orthophosphate, when an orthophosphate compound is used;

(IV) Orthophosphate and hydrolyzable phosphate, when a condensed or blended phosphate is used;

(V) Silica, when a silicate compound is used;

(VI) Calcium;

(VII) Conductivity; and

(VIII) Water temperature.

(ii) At each entry point to the distribution system all of the applicable parameters listed in clause (i) of this subparagraph.

(C) Monitoring after installation of corrosion control. Any large CWS or NTNC that installs optimal corrosion control treatment pursuant to subsection (j)(7)(D)(v) of this section shall measure the water quality parameters at the locations and frequencies specified in this subparagraph during each 6 month monitoring period specified in subdivision (8)(D)(ii)(I) of this subsection. Any small or medium-size CWS or NTNC that installs optimal corrosion control treatment shall conduct such monitoring during each 6 month monitoring period specified in subdivision (8)(D)(ii)(II) of this subsection in which the CWS or NTNC exceeds the lead or copper action level.

(i) Monitoring at taps, 2 samples for:

(I) pH;

(II) Alkalinity;

(III) Orthophosphate, when an inhibitor containing a phosphate compound is used;

(IV) Orthophosphate and hydrolyzable phosphate, when an inhibitor containing condensed or blended phosphate compounds is used;

(V) Silica, when an inhibitor containing a silicate compound is used; and

(VI) Calcium, when calcium carbonate stabilization is used as part of corrosion control.

(ii) At each entry point to the distribution system, at least 1 sample no less frequently than every 2 weeks for:

(I) pH;

(II) When alkalinity is adjusted as part of optimal corrosion control, a reading of the

dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration; and

(III) When a corrosion inhibitor is used as part of optimal corrosion control, a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate, orthophosphate and hydrolyzable phosphate, or silica (whichever is applicable).

(D) Monitoring after the department specifies water quality parameter values for optimal corrosion control. After the department specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment under subsection (j)(8)(F) of this section, all large CWSs and NTNCs shall measure the applicable water quality parameters in accordance with subparagraph (C) of this subdivision and determine compliance with the requirements of subsection (j)(8)(G) of this section every 6 months with the first 6 month period to begin on either January 1 or July 1, whichever comes first, after the department specifies the optimal values under subsection (j)(8)(F) of this section. Any small or medium-size CWS or NTNC shall conduct such monitoring during each 6 month period specified in this subparagraph in which the CWS or NTNC exceeds the lead or copper action level. For any such small and medium-size CWS or NTNC that is on a reduced monitoring frequency pursuant to subdivision (8)(D)(iv) of this subsection at the time of the action level exceedance, the start of the applicable 6 month monitoring period under this subparagraph shall coincide with the start of the applicable monitoring period under subdivision (8)(D)(iv) of this subsection. Compliance with department-designated optimal water quality parameter values shall be determined as specified under subsection (j)(8)(G) of this section.

(E) Reduced monitoring.

(i) Any CWS or NTNC that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of 2 consecutive 6 month monitoring periods under subparagraph (D) of this subdivision shall continue monitoring at the entry point(s) to the distribution system as specified in subparagraph (C)(ii) of this subdivision. Such CWS or NTNC may collect 2 tap water samples for applicable water quality parameters from the following reduced number of sites in Table 9-E2 of this clause during each 6 month monitoring period.

TABLE 9-E2. REDUCED SAMPLING SITES FOR LEAD AND COPPER

Size of CWS or NTNC(Number of People Served)	*Reduced Number of Sites for Water Quality Parameters*
Greater than 100,000	10
10,001 to 100,000	7
3,301 to 10,000	3
501 to 3,300	2
101 to 500	1
Less than or equal to 100	1

(ii)

(I) Any CWS or NTNC that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under subsection (j)(8)(F) of this section during 3 consecutive years of monitoring may reduce

the frequency with which the CWS or NTNC collects the number of tap water samples for applicable water quality parameters specified in this subparagraph from every 6 months to annually. This sampling begins during the calendar year immediately following the end of the monitoring period in which the third consecutive year of 6 month monitoring occurs. Any CWS or NTNC that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under subsection (j)(8)(F) of this section during 3 consecutive years of annual monitoring under this subparagraph may reduce the frequency with which the CWS or NTNC collects the number of tap water samples for applicable water quality parameters specified in clause (i) of this subparagraph from annually to every 3 years. This sampling begins not later than the third calendar year after the end of the monitoring period in which the third consecutive year of monitoring occurs.

(II) A CWS or NTNC may reduce the frequency with which the CWS or NTNC collects tap water samples for applicable water quality parameters specified in clause (i) of this subparagraph to every 3 years if the CWS or NTNC demonstrates during 2 consecutive monitoring periods that the CWS's or NTNC's tap water lead level at the 90th percentile is less than or equal to the PQL for lead of 0.005 mg/l, that the CWS's or NTNC's tap water copper level at the 90th percentile is less than or equal to the PQL for copper of 0.65 mg/l, and that the CWS or NTNC also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under subsection (j)(8)(F) of this section. Monitoring conducted every 3 years shall be done not later than every third calendar year.

(iii) A CWS or NTNC that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

(iv) Any CWS or NTNC subject to reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the department under subsection (j)(8)(F) of this section for more than 9 days in any 6 month period specified in subsection (j)(8)(G) of this section shall resume distribution system tap water sampling for water quality parameters in accordance with the number and frequency requirements in subparagraph (D) of this subdivision, shall conduct tap water sampling for lead and copper at the frequency specified in subdivision (8)(D)(iii) of this subsection, and shall collect the number of samples specified for standard monitoring in subdivision (8)(C) of this subsection. Such a CWS or NTNC may resume annual monitoring for water quality parameters at the tap, at the reduced number of sites specified in clause (i) of this subparagraph, after the CWS or NTNC has completed 2 subsequent consecutive 6 month rounds of monitoring that meet the criteria of clause (i) of this subparagraph, and may resume monitoring once every 3 calendar years for water quality parameters at the tap at the reduced number of sites, after the CWS or NTNC demonstrates through subsequent rounds of monitoring that the CWS or NTNC meets the criteria of either clause (ii) or (iii) of this subparagraph.

(F) Additional monitoring by CWSs and NTNCs. The results of any monitoring conducted in addition to the minimum requirements of this subdivision shall be considered by the CWS or NTNC and the department in making any determinations (i.e. determining concentrations of water quality parameters) under this subdivision or subsection (j)(8) of

this section.

TABLE 9-E3. SUMMARY OF MONITORING REQUIREMENTS FOR WATER QUALITY PARAMETERS [1]

Monitoring Period	Parameters [2]	Location	Frequency
Initial Monitoring	pH, alkalinity, orthophosphate or silica [3], calcium, conductivity, temperature	Taps and at entry points to distribution system	Every 6 months
After Installation of Corrosion Control	pH, alkalinity, orthophosphate or silica, [3] calcium [4]	Taps	Every 6 months
	pH, alkalinity dosage rate concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system	No less frequently than every 2 weeks
After Department specifies Parameter Values for Optimal Corrosion Control	pH, alkalinity, orthophosphate or silica, [3] calcium [4]	Taps	Every 6 months
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system	No less frequently than every 2 weeks
Reduced Monitoring	pH, alkalinity, orthophosphate or silica, [3] calcium [4]	Taps	Every 6 months, annually [6], or every 3 years [7], at reduced number of sites
	pH, alkalinity dosage rate and concentration (if alkalinity adjusted as part of corrosion control), inhibitor dosage rate and inhibitor residual [5]	Entry point(s) to distribution system	No less frequently than every 2 weeks

Notes:

[1]Table is for illustrative purposes. Consult the text of this subdivision and subsections (e)(7)(K), (e)(8) and (e)(10), and (j)(6) through (j)(10) of this section for detailed regulatory requirements.

[2]Small and medium-size CWSs and NTNCs shall monitor for water quality parameters

only during monitoring periods in which the CWS or NTNC exceeds the lead or copper action level.

[3]Orthophosphate shall be measured only when an inhibitor containing phosphate compound is used. Silica shall be measured only when an inhibitor containing silicate compound is used.

[4]Calcium shall be measured only when calcium carbonate stabilization is used as part of corrosion control.

[5]Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) shall be measured only when an inhibitor is used.

[6]A CWS or NTNC may reduce frequency of monitoring for water quality parameters at the tap, from every 6 months to annually, if the CWS or NTNC has maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of monitoring.

[7]A CWS or NTNC may further reduce the frequency of monitoring for water quality parameters at the tap, from annually to once every 3 years, if the CWS or NTNC has maintained the range of values for water quality parameters reflecting optimal corrosion control during 3 consecutive years of annual monitoring. The CWS or NTNC may reduce monitoring from every 6 months to once every 3 calendar years, but not later than every third calendar year, for water quality parameters at the tap if the CWS or NTNC has maintained all of the following 90th percentile lead levels less than or equal to 0.005 mg/l, 90th percentile copper levels less than or equal to 0.65 mg/l, and the range of water quality parameters designated by the department under subsection (j)(8)(F) of this section, as representing optimal corrosion control, during 2 consecutive 6 month monitoring periods.

(10) Monitoring requirements for lead and copper in source water. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) Sample location, collection methods, and number of samples.

(i) A CWS or NTNC that fails to meet the lead or copper action level on the basis of tap water samples collected in accordance with subdivision (8) of this subsection shall collect lead and copper source water samples in accordance with the following requirements in subclauses (I) and (II) of this clause regarding sample location, number of samples, and collection methods:

(I) CWSs and NTNCs with ground water sources shall take a minimum of 1 sample at every point of entry to the distribution system which is representative of each active source of supply after treatment, unless conditions make another location more representative of each source or treatment plant. CWSs and NTNCs with surface water sources and CWSs and NTNCs with a combination of active surface and ground water sources shall take a minimum of 1 sample at every point of entry to the distribution system after any application of treatment or in the distribution system at a point which is representative of each active source after treatment, unless conditions make another location more representative of each source or treatment plant.

(II) If a CWS or NTNC draws water from more than 1 source and the sources are combined before distribution, the CWS or NTNC shall sample at a point of entry to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(ii) Where the results of sampling exceed the maximum permissible source water levels established under subsection (j)(9)(B)(iv) of this section, the department may require that 1 additional sample be collected as soon as possible after the initial sample was taken (but not to exceed 2 weeks) at the same sampling point. If a department-required confirmation sample is taken for lead or copper, then the results of the initial and confirmation sample shall be averaged in determining compliance with the department-specified maximum permissible levels. Any sample value below the detection limit shall be considered to be zero. Any value above the detection limit but below the PQL shall be considered as either the measured value or 0.5 the PQL.

(B) Monitoring frequency after a CWS or NTNC exceeds a tap water action level. Any CWS or NTNC which exceeds the lead or copper action level at the tap shall collect 1 source water sample from each entry point to the distribution system not later than 6 months after the end of the tap water monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the department has established an alternate monitoring period, the last day of that period.

(C) Monitoring frequency after installation of source water treatment. Any CWS or NTNC that installs source water treatment pursuant to subsection (j)(9)(A)(iii) of this section, shall collect an additional source water sample from each entry point to the distribution system during 2 consecutive 6 month monitoring periods by the deadline specified in subsection (j)(9)(A)(iv) of this section.

(D) Monitoring frequency after the department specifies maximum permissible source water levels or determines that source water treatment is not needed.

(i) A CWS or NTNC shall monitor at the frequency specified in this subparagraph in cases where the department specifies maximum permissible source water levels under subsection (j)(9)(B)(iv) of this section or determines that the CWS or NTNC is not required to install source water treatment under subsection (j)(9)(B)(ii) of this section.

(I) A CWS or NTNC using only ground water shall collect samples once during the 3-year compliance period in effect when the applicable department determination under this clause is made. Such CWSs and NTNCs shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year.

(II) A CWS or NTNC using surface water or a combination of surface water and ground water shall collect samples once during each calendar year, the first annual monitoring period to begin on the date on which the applicable department determination is made under this clause.

(ii) A CWS or NTNC is not required to conduct source water sampling for lead or copper if the CWS or NTNC meets the action level for the specific contaminant in tap water samples during the entire source water sampling period applicable to the CWS or NTNC under this subparagraph.

(E) Reduced monitoring frequency.

(i) A CWS or NTNC using only ground water may reduce the monitoring frequency for lead and copper in source water to once during each 9-year compliance cycle provided that the samples are collected not later than every ninth calendar year and if the CWS or NTNC meets 1 of the following criteria:

(I) The CWS or NTNC demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department in subsection (j)(9)(B)(iv) of this section during at least 3 consecutive compliance periods under this clause; or

(II) The department has determined that source water treatment is not needed and the CWS or NTNC demonstrates that, during at least 3 consecutive compliance periods in which sampling was conducted under this clause, the concentration of lead in source water was less than or equal to 0.005 mg/l and the concentration of copper in source water was less than or equal to 0.65 mg/l.

(ii) A CWS or NTNC using surface water (or a combination of surface water and ground water) may reduce the monitoring frequency in this clause to once during each 9-year compliance cycle provided that the samples are collected not later than every ninth calendar year and if the CWS or NTNC meets 1 of the following criteria:

(I) The CWS or NTNC demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department in subsection (j)(9)(B)(iv) of this section for at least 3 consecutive years; or

(II) The department has determined that source water treatment is not needed and the CWS or NTNC demonstrates that, during at least 3 consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/l and the concentration of copper in source water was less than or equal to 0.65 mg/l.

(11) Monitoring requirements for disinfection byproducts, residuals, and precursors.

(A) Disinfectant residuals, disinfection byproducts, and disinfection byproduct precursors.

(i) General.

(I) Requirements.

(1) Any CWS or NTNC that adds a chemical disinfectant to the water in any part of the drinking water treatment process shall modify such CWS's or NTNC's practices to meet the MCLs and MRDLs in subparagraph (B)(i) and (ii) of this subdivision, respectively, and the treatment technique requirements for disinfection byproduct precursors in subsection (j)(11) of this section. Any such CWS or NTNC that purchases water from a system that adds a chemical disinfectant to the water in any part of the drinking water treatment process and is not part of the supplying system's monitoring plan under clause (iii)(VI) of this subparagraph shall modify the purchasing CWS's or NTNC's practices to meet the MCLs and MRDLs in subparagraph (B)(i) and (ii) of this subdivision, respectively, and the treatment technique requirements for disinfection byproduct precursors in subsection (j)(11) of this section.

(2) Any TNC that uses chlorine dioxide as a disinfectant or oxidant shall modify such TNC's practices to meet the MRDL for chlorine dioxide in subparagraph (B)(ii) of this subdivision. Any such TNC that purchases water from a system that uses chlorine dioxide as a disinfectant or oxidant and is not part of the supplying system's monitoring plan under clause (iii)(VI) of this subparagraph shall modify the purchasing TNC's practices to meet the MRDL for chlorine dioxide in subparagraph (B)(ii) of this subdivision.

(II) Applicability. Unless otherwise noted, all CWSs and NTNCs that add a chemical

disinfectant or that purchase water from a system that adds a chemical disinfectant and TNCs that use chlorine dioxide as a disinfectant or oxidant or that purchase water from a system that uses chlorine dioxide as a disinfectant or oxidant and is not part of the supplying system's monitoring plan under clause (iii)(VI) of this subparagraph shall comply with the requirements of this subparagraph and the MCLs and MRDLs in subparagraph (B) of this subdivision.

(III) Notwithstanding the MRDLs in subparagraph (B)(ii) of this subdivision, such CWSs and such NTNCs may increase residual disinfectant levels in the distribution system of chlorine or chloramines, but not chlorine dioxide, to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(IV) Table 11-A1 of this subclause establishes the best technology, treatment techniques, or other means available for achieving compliance with the MCLs as running annual averages for the disinfectant byproducts established in Table 11-B1 of subparagraph (B)(i) of this subdivision:

TABLE 11-A1. BEST AVAILABLE TECHNOLOGY FOR DISINFECTION BYPRODUCTS

DISINFECION BYPRODUCT	**BEST AVAILABLE TECHNOLOGY**
TTHM	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant
HAA5	Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant
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

(ii) Analytical requirements. Such CWSs, such NTNCs and such TNCs shall use only the analytical method or methods specified in 40 CFR 141.131, as amended from time to time, to demonstrate compliance with the requirements of this subparagraph.

(iii) Monitoring requirements.

(I) General requirements.

(1) Such CWS, such NTNC or such TNC shall take all samples during normal operating conditions.

(2) Such CWS, such NTNC or such TNC may use previously collected data to qualify for reduced monitoring if the data meets the location and frequency requirements of this subdivision.

(3) All samples shall be analyzed by a department-approved laboratory pursuant to section 19a-29a of the Connecticut General Statutes. The department may grant an exemption, in writing, for the daily chlorite samples when the chlorite analysis is conducted

by a certified treatment operator using a method approved by the department.

(II) Disinfection byproducts.

(1) TTHM and HAA5.

(A) Routine monitoring for TTHM and HAA5. Such CWS or such NTNC shall conduct routine monitoring at the locations and frequencies indicated in the following Table 11-A2 of this subclause:

TABLE 11-A2. ROUTINE MONITORING FREQUENCY FOR TTHM AND HAA5

Type of such CWS or such NTNC	*Minimum Monitoring Frequency* [1]	*Sample Location in the Distribution System* [2]
Such CWS or such NTNC using surface water or GWUDI in whole or in part and serving 10,000 or more persons	4 samples per quarter per treatment plant	At least 25 percent 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
Such CWS or such NTNC using surface water or GWUDI in whole or in part and serving fewer than 10,000 persons	1 sample per quarter per treatment plant	Location representing maximum residence time
Such CWS or such NTNC using only ground water not under the direct influence of surface water and serving 10,000 or more persons	1 sample per quarter per treatment plant	Location representing maximum residence time
Such CWS or such NTNC using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons	1 sample per year per treatment plant during the third calendar quarter	Location representing maximum residence time [3]

NOTES:

[1]Multiple wells drawing water from a single aquifer may be considered 1 treatment plant for determining the minimum number of samples required, with written approval from the

department.

[2]If such CWS or such NTNC 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, shall be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples shall be taken at locations representative of at least average residence time in the distribution system.

[3] If the sample, or average of annual samples if more than 1 sample is taken, exceeds the MCL, such CWS or such NTNC shall increase monitoring to 1 sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system. Such CWS or such NTNC on increased monitoring may return to routine monitoring if, after at least 1 year of monitoring, such CWS's or such NTNC's TTHM annual average is 0.060 mg/l and HAA5 annual average is <0.045 mg/l and such CWS or such NTNC is granted approval by the department in writing.

(B) Reduced monitoring for TTHM and HAA5.

(i) Such CWS or such NTNC may reduce monitoring in accordance with the following Table 11-A3 of this subclause with the written approval of the department:

TABLE 11-A3. REDUCED MONITORING FREQUENCY FOR TTHM AND HAA5

Type of such CWS or such NTNC	*Criteria for Monitoring Reduction* [1]	*Minimum Monitoring Frequency*	*Sample Location in the Distribution System*
Such CWS or such NTNC using surface water or GWUDI in whole or in part and serving at least 10,000 persons	Source water annual average TOC level, before any treatment, <4.0 mg/l; TTHM annual average <0.040 mg/l; and HAA5 annual average <0.030 mg/l	1 sample per quarter per treatment plant	Location representing maximum residence time
Such CWS or such NTNC using surface water or GWUDI in whole or in part and serving fewer than 10,000 persons	Source water annual average TOC level, before any treatment, <4.0 mg/l; TTHM annual average <0.040 mg/l; and HAA5 annual average <0.030 mg/l	1 sample per year per treatment plant during the third calendar quarter	Location representing maximum residence time
Such CWS or such NTNC using only ground water	TTHM annual average <0.040 mg/l; and HAA5	1 sample per year per treatment plant during the	Location representing maximum residence time

not under the direct influence of surface water and serving at least 10,000 persons	annual average <0.030 mg/l	third calendar quarter	
Such CWS or such NTNC using only ground water not under the direct influence of surface water and serving fewer than 10,000 persons	TTHM annual average <0.040 mg/l; and HAA5 annual average <0.030 mg/l [2]	1 sample every 3 years per treatment plant during the third calendar quarter [3]	Location representing maximum residence time

NOTES:

[1] Such CWS or such NTNC shall have monitored for at least 1 year.

[2] Averages for 2 consecutive years, or TTHM annual average <0.020 mg/l and HAA5 annual average <0.015 mg/l for 1 year.

[3] 3 year cycle begins January 1 following the quarter in which such CWS or such NTNC qualifies for reduced monitoring.

(ii) Such CWS or such NTNC on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for such CWSs and such NTNCs which shall monitor quarterly) or the result of the sample (for such CWSs and such NTNCs which shall monitor no more frequently than annually) is no more than 0.060 mg/l and 0.045 mg/l for TTHM and HAA5, respectively. Such CWSs and such NTNCs that do not meet these levels shall resume routine monitoring in the quarter immediately following the quarter in which such CWS or such NTNC exceeds either of these levels. For such CWS or such NTNC 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, such CWS or such NTNC shall begin increased monitoring, as indicated in subclause (II)(1)(A) of this clause, in the quarter immediately following the monitoring period in which such CWS or such NTNC exceeds 0.080 mg/l or 0.060 mg/l for TTHM or HAA5 respectively.

(C) Monitoring requirements for source water TOC. In order to qualify for reduced monitoring for TTHM and HAA5 under subclause (II)(1)(B) of this clause, such CWS or such NTNC that is a Subpart H system and does not monitor under the provisions of subclause (IV) of this clause shall take monthly TOC samples every 30 days at a location prior to any treatment. In addition to meeting other criteria for reduced monitoring in subclause (II)(1)(B) of this clause, the source water TOC running annual average shall be ≤4.0 mg/l (based on the most recent 4 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 subclause (II)(1)(B) of this clause, such CWS or such NTNC that is a Subpart H system and does not monitor under the provisions of subclause (IV) of this clause may reduce source water TOC monitoring to

quarterly TOC samples taken every 90 days at a location prior to any treatment.

(D) Such CWSs and such NTNCs on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for such CWSs and such NTNCs that shall monitor quarterly) or the result of the sample (for such CWSs and such NTNCs that shall monitor no more frequently than annually) is no more than 0.060 mg/l and 0.045 mg/l for TTHMs and HAA5, respectively. Such CWSs and such NTNCs that do not meet these levels shall resume monitoring at the frequency identified in the *Minimum Monitoring Frequency* column in Table 11-A2 of this subparagraph in the quarter immediately following the monitoring period in which such CWS or such NTNC exceeds 0.060 mg/l or 0.045 mg/l for TTHMs and HAA5, respectively. For such CWSs and such NTNCs 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, such CWSs and such NTNCs shall go to the increased monitoring identified in the *Sample Locationin the Distribution System* column in Table 11-A2 of this subparagraph in the quarter immediately following the monitoring period in which such CWSs and such NTNCs exceed 0.080 mg/l or 0.060 mg/l for TTHM or HAA5, respectively.

(2) Chlorite. Such CWSs, such NTNCs and such TNCs using chlorine dioxide, for disinfection or oxidation, shall conduct monitoring for chlorite.

(A) Routine monitoring for chlorite. Such CWS, such NTNC or such TNC shall take daily chlorite samples at the entrance to the distribution system and shall also take a 3-sample set for chlorite each month in the distribution system. Such CWS, such NTNC or such TNC shall take 1 sample at each of the following locations: near the first consumer, at a location representative of average residence time and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling shall be conducted in the same manner as 3-sample sets, at the specified locations. Such CWS, such NTNC or such TNC may use the results of additional monitoring conducted according to subclause (II)(2)(B) of this clause to meet its monthly requirement.

(B) Additional monitoring for chlorite. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, such CWS, such NTNC or such TNC shall take 3 chlorite distribution system samples at the following locations: as close to the first consumer as possible, in a location representative of average residence time and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(C) Reduced monitoring for chlorite.

(i) Routine chlorite monitoring at the entrance to the distribution system shall not be reduced.

(ii) Chlorite monitoring in the distribution system may be reduced to 1 3-sample set per quarter after 1 year of monitoring where no routine individual chlorite sample taken in the distribution system has exceeded the chlorite MCL and such CWS, such NTNC or such TNC, has not been required to conduct additional monitoring in accordance with subclause (II)(2)(B) of this clause. Such CWS, NTNC or TNC may remain on the reduced monitoring schedule until either:

(I) Any of the 3 individual chlorite samples taken quarterly in the distribution system

exceeds the chlorite MCL; or

(II) Such CWS, such NTNC or such TNC is required to conduct additional monitoring according to subclause (II)(2)(B) of this clause, at which time such CWS, such NTNC or such TNC shall revert to routine monitoring.

(3) Bromate. Such CWS or such NTNC using ozone, for disinfection or oxidation, in any part of the treatment process shall conduct monitoring for bromate.

(A) Routine monitoring for bromate. Such CWS or such NTNC shall take 1 bromate sample each month at the entrance to the distribution system for each treatment plant in such CWS or such NTNC.

(B) Reduced monitoring for bromate. Such CWS or such NTNC may reduce monitoring from monthly to quarterly, if such CWS's or such NTNC's running annual average bromate concentration is ≤0.0025 mg/l based on monthly bromate measurements under subclause (II)(3)(A) of this clause for the most recent 4 quarters, with samples analyzed using EPA Method 317.0 Revision 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," EPA, July 2001, EPA 815– B–01–001, EPA Method 326.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis," EPA, June 2002, EPA 815–R–03–007, or EPA Method 321.8, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Volume 1, EPA, August 2000, EPA 815–R–00–014 (available through NTIS, PB2000– 106981). Such CWS or such NTNC that qualified for reduced bromate monitoring prior to April 1, 2009, may remain on reduced monitoring as long as the running annual average of quarterly bromate samples is ≤0.0025 mg/l based on samples analyzed using EPA Method 317.0 Revision 2.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis," EPA, July 2001, EPA 815– B–01–001, EPA Method 326.0, "Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis," EPA, June 2002, EPA 815–R–03–007, or EPA Method 321.8, "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Volume 1, EPA, August 2000, EPA 815–R–00–014 (available through NTIS, PB2000– 106981). If the running annual average bromate concentration is >0.0025 mg/l, such CWS or such NTNC shall resume routine monitoring required by subclause (II)(3)(A) of this clause.

(4) Such CWS, such NTNC or such TNC that is required to comply with subclause (II) of this clause shall determine such CWS's, such NTNC's or such TNC's minimum monitoring frequency for disinfection byproducts as follows:

(A) Such CWS's, such NTNC's or such TNC's own sources of water, if any, as well as each seller's source(s) of water, to determine if such CWS, such NTNC or such TNC uses surface water or GWUDI, in whole or in part, or if such CWS, such NTNC or such TNC uses only ground water not under the direct influence of surface water;

(B) Such CWS's, such NTNC's or such TNC's own population, without considering the population of any system from which such CWS, such NTNC or such TNC purchases water

or to which such CWS, such NTNC or such TNC sells water; and

(C) A sum for the number of treatment plants calculated as the number of treatment plants in such CWS's, such NTNC's or such TNC's own system plus 1 for each applicable system to which such CWS, such NTNC or such TNC sells water.

(III) Disinfectant residuals.

(1) Chlorine and chloramines. Such CWSs and such NTNCs that use chlorine or chloramines in any part of the treatment process shall conduct monitoring for chlorine and chloramines.

(A) Routine monitoring for chlorine and chloramines. Such CWSs and such NTNCs shall 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 in accordance with subsection (e)(7) of this section. Such CWSs and such NTNCs that are Subpart H systems may use the results of RDC sampling conducted under 40 CFR 141.74(c)(3)(i), as amended from time to time, in lieu of taking separate samples.

(B) Reduced monitoring for chlorine and chloramines. Monitoring shall not be reduced.

(2) Chlorine dioxide. Such CWSs, such NTNCs, and such TNCs that use chlorine dioxide for disinfection or oxidation shall conduct monitoring for chlorine dioxide.

(A) Routine monitoring for chlorine dioxide. Such CWSs, such NTNCs, and such TNCs shall take daily chlorine dioxide samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, such CWS, such NTNC, or such TNC shall take chlorine dioxide samples in the distribution system the following day at the locations required by subclause (III)(2)(B) of this clause, in addition to the sample required at the entrance to the distribution system. Such CWSs, such NTNCs and such TNCs that purchase water from a system that is required to conduct additional monitoring shall also comply with subclause (III)(2)(B) of this clause.

(B) Additional monitoring for chlorine dioxide. On each day following a routine sample monitoring result that exceeds the MRDL, such CWS, such NTNC, or such TNC shall take 3 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), such CWS, such NTNC, or such TNC shall take 3 samples as close to the first consumer as possible, at intervals of at least 6 hours. If chlorine is used to maintain a disinfectant residual in the distribution system and there are 1 or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), such CWS, such NTNC, or such TNC shall take 1 sample at each of the following locations: as close to the first consumer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

(C) Reduced monitoring for chlorine dioxide. Monitoring shall not be reduced.

(IV) Disinfection byproduct precursors. Such CWS or such NTNC that is a Subpart H system and that uses conventional filtration treatment shall conduct monitoring for disinfection byproduct precursors.

(1) Routine monitoring. Such CWS or such NTNC shall monitor each treatment plant

for TOC not later than the point of combined filter effluent turbidity monitoring and representative of the treated water. Such CWS or such NTNC shall 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 such CWSs and such NTNCs shall monitor for alkalinity in the source water prior to any treatment. Such CWS or such NTNC shall take 1 paired sample and 1 source water alkalinity sample each month for each plant at a time representative of normal operating conditions and influent water quality.

(2) Reduced monitoring. Such CWS or such NTNC that has an average treated water TOC of less than 2.0 mg/l for 2 consecutive years, or less than 1.0 mg/l for 1 year, may reduce monitoring for both TOC and alkalinity to 1 paired sample and 1 source water alkalinity sample for each plant for each quarter. Such CWS or such NTNC shall revert to routine monitoring in the month following the quarter when the annual average treated water TOC is 2.0 mg/l or greater.

(V) Bromide. Such CWS or such NTNC that is required to analyze for bromate may reduce bromate monitoring from monthly to once per quarter if such CWS or such NTNC demonstrates that the average source water bromide concentration is <0.05 mg/l based upon representative monthly measurements for 1 year. Such CWS or such NTNC that is required to analyze for bromate shall continue bromide monitoring to remain on reduced bromate monitoring.

(VI) Monitoring plans. Each such CWS, such NTNC or such TNC that is required to monitor under this subparagraph shall develop and implement a monitoring plan. Such CWS, such NTNC or such TNC shall maintain such CWS's, such NTNC's or such TNC's monitoring plan and make it available for inspection by the department and the public. Such CWSs, such NTNCs and such TNCs that are Subpart H systems and that serve more than 1,000 persons shall submit a copy of such CWS's, such NTNC's or such TNC's monitoring plan to the department not later than the date of the first report required under subsection (h)(7) of this section. The department may also require any other system to submit a monitoring plan. Such CWS, such NTNC or such TNC may only implement a monitoring plan that the department has reviewed and approved. If the department determines that the monitoring plan contains the required elements in this subclause, the department may approve such monitoring plan. The department may request that such CWS, such NTNC or such TNC provide to the department additional information necessary to aid the department in its review of the monitoring plan, and may require changes to the monitoring plan. After the department's review and approval, the department may require changes in any plan elements. Failure by such CWS, such NTNC or such TNC to monitor in accordance with its monitoring plan is a monitoring violation. The plan shall include at least the following elements:

(1) Specific locations and schedules for collecting samples for any parameters included in this subparagraph. Sample locations that represent a point of average or maximum residence time for multiple treatment plants may be used to satisfy the requirements of subclause (II) of this clause for each applicable treatment plant, with the department's written approval; and

(2) How such CWS, such NTNC or such TNC will calculate compliance with the MCLs, MRDLs, and treatment techniques.

(iv) Compliance requirements.

(I) General requirements.

(1) Where compliance is based on a running annual average of monthly or quarterly samples or averages and such CWS or such NTNC fails to monitor for TTHM, HAA5, or bromate, this failure to monitor shall 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 such CWS's or such NTNC's failure to monitor makes it impossible to determine compliance with the MRDL for chlorine and chloramines, this failure to monitor shall be treated as a monitoring violation for the entire period covered by the annual average.

(2) All samples taken and analyzed under the provisions of this subparagraph shall be included in determining compliance, even if that number is greater than the minimum required.

(3) If, during the first year of monitoring under clause (iii) of this subparagraph, any individual quarter's average will cause the running annual average of that such CWS or such NTNC to exceed the MCL for TTHM, HAA5 or bromate, or the MRDL for chlorine or chloramine, such CWS or such NTNC is out of compliance at the end of that quarter.

(II) Disinfection byproducts.

(1) THM and HAA5.

(A) For such CWS or such NTNC monitoring quarterly, compliance with the MCLs in subparagraph (B)(i) of this subdivision shall be based on a running annual average, computed quarterly, of quarterly averages of all samples collected by such CWS or such NTNC as prescribed by clause (iii)(II)(1) of this subparagraph. If such CWS or such NTNC fails to complete 4 consecutive quarters of monitoring, compliance with the MCL for the last 4-quarter compliance period shall be based on an average of the available data.

(B) For such CWS or such NTNC monitoring less frequently than quarterly, such CWS or such NTNC shall demonstrate MCL compliance if the average of samples taken under the provisions of clause (iii)(II)(1) of this subparagraph do not exceed the MCLs in subparagraph (B)(i) of this subdivision. If the average of these samples exceeds the MCL, such CWS or such NTNC shall increase monitoring to once each quarter for each treatment plant and such CWS or such NTNC is not in violation of the MCL until such CWS or such NTNC has completed 1 year of quarterly monitoring, unless the result of fewer than 4 quarters of monitoring will cause the running annual average to exceed the MCL, in which case such CWS or such NTNC is in violation at the end of that quarter. Such CWS or such NTNC that is required to increase monitoring frequency to quarterly monitoring shall calculate compliance by including the sample which triggered the increased monitoring plus the following 3 quarters of monitoring.

(C) If the running annual arithmetic average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, such CWS or such NTNC is in violation of the MCL.

(2) Bromate. Compliance shall be based on a running annual average, computed quarterly, of monthly samples (or, for months in which such CWS or such NTNC takes

more than 1 sample, the average of all samples taken during the month) collected by such CWS or such NTNC as prescribed by clause (iii)(II)(3) of this subparagraph. If the average of samples covering any consecutive 4-quarter period exceeds the MCL, such CWS or such NTNC is in violation of the MCL and shall notify the public pursuant to the procedures for public notification in subsection (i) of this section, in addition to reporting to the department pursuant to subsection (h)(7) of this section. If such CWS or such NTNC fails to complete 12 consecutive months of monitoring, compliance with the MCL for the last 4-quarter compliance period shall be based on an average of the available data.

(3) Chlorite. Compliance shall be based on an arithmetic average of each 3-sample set taken in the distribution system as prescribed by clauses (iii)(II)(2)(A) and (B) of this subparagraph. If the average of any 3 sample set exceeds the MCL, such CWS or such NTNC is in violation of the MCL and shall notify the public pursuant to the procedures for public notification in subsection (i) of this section and the department pursuant to subsection (h)(7) of this section.

(III) Disinfectant residuals.

(1) Chlorine and chloramines.

(A) Compliance shall be based on a running annual average, computed quarterly, of monthly averages of all samples collected by such CWS or such NTNC under clause (iii)(III)(1) of this subparagraph. If the average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, such CWS or such NTNC is in violation of the MRDL and shall notify the public pursuant to the procedures for public notification in subsection (i) of this section and the department pursuant to subsection (h)(7) of this section.

(B) In cases where such CWSs and such NTNCs switch between the use of chlorine and chloramines for residual disinfection during the year, compliance shall be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to subsection (h)(7) of this section shall clearly indicate which residual disinfectant was analyzed for each sample.

(2) Chlorine dioxide.

(A) Violations requiring tier 1 notice. Compliance shall be based on consecutive daily samples collected by such CWS, such NTNC or such TNC under clause (iii) of this subparagraph. If any daily sample taken at the entrance to the distribution system exceeds the MRDL and, on the following day, 1 (or more) of the 3 samples taken in the distribution system exceed the MRDL, such CWS, such NTNC or such TNC is in violation of the MRDL and shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and shall notify the public pursuant to the procedures for a tier 1 notice in subsection (i)(1) of this section and the department pursuant to subsection (h)(7) of this section. 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 such CWS, such NTNC or such TNC shall notify the public of the violation in accordance with the procedures for a tier 1 notice in subsection (i)(1) of this section and the department pursuant to subsection (h)(7) of this section.

(B) Violations requiring tier 2 notice. Compliance shall be based on consecutive daily samples collected by such CWS, such NTNC or such TNC under clause (iii)(III)(2) of this

subparagraph. If any 2 consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, such CWS, such NTNC or such TNC is in violation of the MRDL and shall take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and shall notify the public pursuant to the procedures for a tier 2 notice in subsection (i)(2) of this section and the department pursuant to subsection (h)(7) of this section. 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 such CWS, such NTNC or such TNC shall notify the public of the violation in accordance with the procedures for tier 2 notice in subsection (i)(2) of this section and the department pursuant to subsection (h)(7) of this section.

(IV) Disinfection byproduct precursors. Compliance shall be determined as specified by subsection (j)(11)(C) and (D) of this section. Such CWS or such NTNC may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for such CWS or such NTNC. This monitoring is not required and failure to monitor during this period is not a violation. However, any such CWS or such NTNC that does not monitor during this period, and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in subsection (j)(11)(B)(i) of this section and shall 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 (j)(11)(B)(ii) of this section and is in violation. Such CWSs and such NTNCs may apply for alternate minimum TOC removal (Step 2) requirements any time after the compliance date. For such CWSs and such NTNCs required to meet Step 1 TOC removals, if the value calculated under subsection (j)(11)(C)(iv) of this section is less than 1.00, such CWS or such NTNC is in violation of the treatment technique requirements and shall notify the public pursuant to the procedures for public notification in subsection (i) of this section and the department pursuant to subsection (h)(7) of this section.

(B) MCLs, MCLGs, MRDLs, and MRDLGs for disinfectants.

(i) MCLs and MCLGs. All such CWSs and such NTNCs shall comply with the MCLs for disinfectant byproducts in Table 11-B1 of this clause.

TABLE 11-B1. DISINFECTION BYPRODUCTS AND THEIR LIMITS

DISINFECTION BYPRODUCTS	MCL (MG/L)[1]	MCLG (MG/L)
Bromate	0.010	ZERO
Chlorite	1.0	0.8
Haloacetic acids (five)	0.060	N/A
-dichloroacetic acid	*	ZERO
-monochloroacetic acid	*	0.07
-trichloroacetic acid	*	0.02
Total Trihalomethanes	0.080	N/A
-Bromodichloromethane	*	ZERO

DISINFECTION BYPRODUCTS	MCL (MG/L)[1]	MCLG (MG/L)
-Bromoform	*	ZERO
-Chloroform	*	0.07
-Dibromochloromethane	*	0.06

N/A Not applicable.

*No individual MCL for TTHM and HAA5 constituents.

[1] Such CWS or such NTNC that serves ≥ 10,000 people shall comply with these MCLs as a LRAA, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall comply with these MCLs as a running annual average until the department-approved date. Such CWS or such NTNC that serves < 10,000 and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, shall comply with these MCLs as a LRAA, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall comply with these MCLs as a running annual average until the department-approved date. Such CWS or such NTNC that serves < 10,000 and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, shall comply with these MCLs as a running annual average until the date specified in subparagraph (C)(i)(III) of this subdivision. After the date specified in subparagraph (C)(i)(III) of this subdivision, such CWS or such NTNC that serves < 10,000 and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, shall comply with these MCLs as a LRAA.

(ii) MRDLs and MRDLGs. Such CWSs and such NTNCs shall comply with the MRDLs for disinfectant residuals in Table 11-B2 of this clause. In addition, such TNCs shall comply with the MRDL for chlorine dioxide.

TABLE 11-B2. DISINFECTANTS AND THEIR LIMITS

DISINFECTANT RESIDUAL	MRDL (MG/L)	MRDLG (MG/L)
Chlorine	4.0 (as Cl_2)	4 (as Cl_2)
Chloramine	4.0 (as Cl_2)	4 (as Cl_2)
Chlorine Dioxide[1]	0.8 (as ClO_2)	0.8(as ClO_2)

[1] The MRDL and MRDLG for chlorine dioxide apply to such CWSs, such NTNCs and such TNCs that use chlorine dioxide as a disinfectant or oxidant somewhere in the treatment process.

(C) Monitoring requirements for the Stage 2 disinfection byproducts requirement.

(i) General requirements.

(I) This subparagraph establishes monitoring and other requirements for achieving compliance with MCLs based on LRAA for TTHM and HAA5, and for achieving

compliance with the MRDLs for chlorine and chloramine for certain consecutive systems.

(II) Applicability. A system is subject to the requirements of this subparagraph if the system is a CWS or a NTNC 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.

(III) Schedule.

(1) Such CWS or such NTNC that serves ≥ 10,000 people shall comply with the requirements in this subparagraph, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall comply with the requirements in this subparagraph not later than the department-approved date.

(2) Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, shall comply with the requirements in this subparagraph, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall comply with the requirements in this subparagraph not later than the department-approved date.

(3) Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, shall comply with the requirements in this subparagraph not later than October 1, 2014. Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, may submit an application to the department requesting approval of up to an additional 24 months for compliance with MCLs and operational evaluation levels if such CWS or such NTNC requires capital improvements to comply with a MCL. Such application shall be submitted in accordance with subsection (t) of this section and shall specify the capital improvements required to comply with a MCL.

(4) For consecutive systems and wholesale systems that are part of a combined distribution system, such consecutive system or such wholesale system shall comply with the requirements of this subparagraph at the same time as such CWS or such NTNC with the earliest compliance date in the combined distribution system. For purposes of this subclause, the term "combined distribution system" does not include consecutive systems that receive water from a wholesale system only on an emergency basis or receive only a small percentage of water from a wholesale system. The term "combined distribution system" also does not include wholesale systems that deliver water to a consecutive system only on an emergency basis or deliver only a small percentage of water to a consecutive system that has its own water.

(5) Such CWS or such NTNC shall use the monitoring frequency specified in clause (ii)(I)(2) of this subparagraph.

(A) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from

time to time, is required to conduct quarterly monitoring and the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, then such CWS or such NTNC shall begin monitoring in the first full calendar quarter that includes the department-approved compliance date.

(B) If such CWS or such NTNC that serves ≥ 10,000 people is required to conduct quarterly monitoring and the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, then such CWS or such NTNC shall begin monitoring in the first full calendar quarter that includes the department-approved compliance date.

(C) If such CWS or such NTNC that serves ≥ 50,000 people is required to conduct monitoring at a frequency that is less than quarterly and the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, such CWS or such NTNC shall begin monitoring not later than 12 months after the department-approved compliance date.

(D) If such CWS or such NTNC that serves 10,000 to 49,999 people is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall begin monitoring in the calendar month in such CWS's or such NTNC's IDSE report approved by the department under 40 CFR 141.601 or 40 CFR 141.602 or the calendar month identified in such CWS's or such NTNC's monitoring plan approved by the department under 40 CFR 141.622 not later than October 1, 2014, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall begin monitoring not later than 12 months after the department-approved compliance date.

(E) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall begin monitoring in the calendar month in such CWS's or such NTNC's IDSE report approved by the department under 40 CFR 141.601 or 40 CFR 141.602 or the calendar month identified in the monitoring plan approved by the department under 40 CFR 141.622 not later than October 1, 2014, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall begin monitoring not later than 12 months after the department-approved compliance date.

(F) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct quarterly monitoring, such CWS or such NTNC shall begin monitoring in the first full calendar quarter that includes the compliance date of

October 1, 2014, unless the department approves under subclause (III)(3) of this clause up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall begin monitoring in the first full calendar quarter that includes the department-approved compliance date.

(G) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall begin monitoring in the calendar month in such CWS's or such NTNC's IDSE report approved by the department under 40 CFR 141.601 or 40 CFR 141.602 or the calendar month identified in the monitoring plan approved by the department under 40 CFR 141.622 not later than October 1, 2015, unless the department approves under subclause (III)(3) of this clause up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall begin monitoring not later than 12 months after the department-approved compliance date.

(6)(A) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct quarterly monitoring, such CWS or such NTNC shall make compliance calculations at the end of each quarter (or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters), unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations at the end of the fourth calendar quarter that follows the department-approved compliance date, and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters).

(B) If such CWS or such NTNC that serves ≥ 10,000 people is required to conduct quarterly monitoring, such CWS or such NTNC shall make compliance calculations at the end of each quarter (or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters), unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations at the end of the fourth calendar quarter that follows the department-approved compliance date, and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters).

(C) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct quarterly monitoring, such CWS or such NTNC shall

make compliance calculations at the end of the fourth calendar quarter that follows October 1, 2014, unless the department approves under subclause (III)(3) of this clause up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations at the end of the fourth calendar quarter that follows the department-approved compliance date, and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters).

(D) If such CWS or such NTNC that serves ≥ 10,000 people is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall make compliance calculations pursuant to 40 CFR 141.620(c)(7), as amended from time to time, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations beginning with the first compliance sample taken after the department-approved compliance date.

(E) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall make compliance calculations pursuant to 40 CFR 141.620(c)(7), as amended from time to time, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations beginning with the first compliance sample taken after the department-approved compliance date.

(F) If such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, is required to conduct monitoring at a frequency that is less than quarterly, such CWS or such NTNC shall make compliance calculations beginning with the first compliance sample taken after October 1, 2014, unless the department approves under subclause (III)(3) of this clause up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall make compliance calculations beginning with the first compliance sample taken after the department-approved compliance date.

(IV) Monitoring and compliance.

(1) Such CWSs and such NTNCs that are required to monitor quarterly. To comply with the MCLs for TTHM and HAA5 in Table 11-B1 of subparagraph (B)(i) of this subdivision, such CWSs and such NTNCs shall calculate LRAAs for TTHM and HAA5 using monitoring results collected under this subparagraph and determine that each LRAA does not exceed the MCL. If such CWS or such NTNC fails to complete 4 consecutive quarters of monitoring, such CWS or such NTNC shall calculate compliance with the MCL based

on the average of the available data from the most recent 4 quarters. If such CWS or such NTNC takes more than 1 sample per quarter at a monitoring location, such CWS or such NTNC shall average all samples taken in the quarter at that location to determine a quarterly average to be used in the LRAA calculation.

(2) Such CWSs and such NTNCs that are required to monitor yearly or less frequently. To determine compliance with the MCLs for TTHM and HAA5 in Table 11-B1 of subparagraph (B)(i) of this subdivision, such CWS or such NTNC shall determine that each sample taken is less than the MCL. If any sample exceeds the MCL, such CWS or such NTNC shall comply with the requirements of clause (vi) of this subparagraph. If no sample exceeds the MCL, the sample result for each monitoring location is considered the LRAA for that monitoring location.

(V) Violation. Such CWS or such NTNC is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA, if it fails to monitor for that quarter.

(VI) Best available technologies.

(1) Table 11-C2 of this subclause establishes the best technology, treatment techniques, or other means available for achieving compliance with the MCLs for TTHM and HAA5 as an LRAA identified in Table 11-B1 of subparagraph (B)(i) of this subdivision for all such CWSs and such NTNCs that disinfect their source water:

TABLE 11-C2. BEST AVAILABLE TECHNOLOGY FOR DISINFECTION BYPRODUCTS

DISINFECTION BYPRODUCT	BEST AVAILABLE TECHNOLOGY
TTHM and HAA5	Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff ≤ 1000 Daltons; or GAC20

(2) Table 11-C3 of this subclause establishes the best technology, treatment techniques, or other means available for achieving compliance with the MCLs for TTHM and HAA5 as an LRAA identified in Table 11-B1 of subparagraph (B)(i) of this subdivision for consecutive systems that buy or otherwise receive disinfected water:

TABLE 11-C3. CONSECUTIVE SYSTEM BEST AVAILABLE TECHNOLOGY

DISINFECTION BYPRODUCT	BEST AVAILABLE TECHNOLOGY
TTHM and HAA5	Such CWSs and such NTNCs serving ≥ 10,000: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance.
TTHM and HAA5	Such CWSs and such NTNCs serving < 10,000: Improved distribution system and storage tank management to reduce residence time.

(ii) Routine monitoring.

(I) Monitoring.

(1) Such CWS or such NTNC that serves ≥ 10,000 people with an IDSE report previously approved by the department under 40 CFR 141.605 shall monitor at the locations and during the months identified in the department-approved IDSE report, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall not begin monitoring at the locations and during the months identified in the department-approved IDSE report until that date. Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is not required under 40 CFR 141.701(a)(4), as amended from time to time, with an IDSE report previously approved by the department under 40 CFR 141.605 shall monitor at the locations and during the months identified in the department-approved IDSE report, unless the department has previously approved under 40 CFR 141.620(c) up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall not begin monitoring at the locations and during the months identified in the department-approved IDSE report until that date. Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, with an IDSE report previously approved by the department under 40 CFR 141.605 shall begin monitoring at the locations and during the months identified in the department-approved IDSE report following the schedule in clause (i)(III) of this subparagraph, unless the department approves under clause (i)(III)(3) of this subparagraph up to an additional 24 months for compliance with MCLs and operational evaluation levels because such CWS or such NTNC requires capital improvements to comply with a MCL, in which case such CWS or such NTNC shall not begin monitoring at the locations and during the months identified in the department-approved IDSE report until that date. If such CWS or such NTNC has previously received department approval of such CWS's or such NTNC's 40/30 certification under 40 CFR 141.603, serves fewer than 500 people, has taken TTHM and HAA5 samples under subparagraph (A) of this subdivision and was previously granted by the department a very small system waiver under 40 CFR 141.604 or is a NTNC serving <10,000 people, such CWS or such NTNC shall monitor at the location or locations and on the dates identified in such CWS's or such NTNC's department-approved monitoring plan in subparagraph (A)(iii)(VI) of this subdivision, updated as required by clause (iii) of this subparagraph.

(2) Such CWS or such NTNC shall monitor at no fewer than the number of locations identified in Table 11-C4 of this subclause.

TABLE 11-C4. COMPLIANCE MONITORING LOCATIONS AND FREQUENCIES

SOURCE WATER TYPE	POPULATION SIZE CATEGORY	MONITORING FREQUENCY[1]	DISTRIBUTON SYSTEM MONITORING LOCATION TOTAL PER MONITORING

			PERIOD[2]
Surface Water and GWUDI	<500 people	Per Year	2
	500 – 3,300 people	Per Quarter	2
	3,301 – 9,999 people	Per Quarter	2
	10,000 – 49,999 people	Per Quarter	4
	50,000 – 249,999 people	Per Quarter	8
	250,000 – 999,999 people	Per Quarter	12
	1,000,000 – 4,999,999 people	Per Quarter	16
	≥ 5,000,000 people	Per Quarter	20
Ground Water	<500 people	Per Year	2
	500 – 9,999 people	Per Year	2
	10,000 – 99,999 people	Per Quarter	4
	100,000 – 499,999 people	Per Quarter	6
	≥ 500,000 people	Per Quarter	8

[1]Such CWSs and such NTNCs shall monitor during the month of highest disinfection byproducts concentrations.

[2] Such CWSs and such NTNCs on quarterly monitoring shall take dual sample sets every 90 days at each monitoring location, except for such CWSs and such NTNCs serving 500-3,300 people that are Subpart H systems. Such CWSs and such NTNCs serving 500-9,999 people with only ground water sources on annual monitoring shall take dual sample sets at each monitoring location. All other such CWSs and such NTNCs on annual monitoring and such CWSs and such NTNCs serving 500-3,300 people that are Subpart H systems 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 such CWSs and such NTNCs serving fewer than 500 people, only 1 location with a dual sample set per monitoring period is needed if the highest TTHM and HAA5 concentrations occur at the same location, and during the same month.

(3) If such CWS or such NTNC is an undisinfected system that begins using a disinfectant other than ultraviolet light, such CWS or such NTNC shall consult with the department to identify compliance monitoring locations for this subparagraph. Such CWS or such NTNC that is an undisinfected system that begins using a disinfectant other than ultraviolet light shall then develop a monitoring plan under clause (iii) of this subparagraph that includes those monitoring locations and submit such monitoring plan to the department for approval in accordance with subsection (t) of this section.

(II) Analytical methods. Such CWS or such NTNC shall use an approved method listed in 40 CFR 141.131, as amended from time to time, for TTHM and HAA5 analyses in this subparagraph. Analyses shall be conducted by an environmental laboratory approved by the department under section 19a-29a of the Connecticut General Statutes.

(iii) Monitoring plan of this subparagraph.

(I) (1) Such CWS or such NTNC shall develop and implement a monitoring plan to be kept on file for department and public review. The monitoring plan shall not be implemented until such CWS or such NTNC has received department approval of the monitoring plan. The monitoring plan shall be completed not later than the date such CWS or such NTNC conducts its initial monitoring under this subparagraph and shall be submitted to the department in accordance with subsection (t) of this section. The monitoring plan shall contain the following elements:

(A) Monitoring locations;

(B) Monitoring dates;

(C) Compliance calculation procedures; and

(D) Monitoring plans for any other CWSs and NTNCs in the combined distribution system if the department has permitted reduced monitoring.

(2)If such CWS or such NTNC was not required to submit an IDSE report under 40 CFR 141.601 or 40 CFR 141.602 and does not have sufficient monitoring locations under subparagraph (A) of this subdivision to identify the required number of compliance monitoring locations under this subparagraph, such CWS or such NTNC shall identify in the monitoring plan 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. Such CWS or such NTNC shall also provide in the monitoring plan the rationale for identifying the locations as having high levels of TTHM or HAA5. If such CWS or such NTNC has more monitoring locations under subparagraph (A) of this subdivision than required for compliance monitoring under this subparagraph, such CWS or such NTNC shall identify in the monitoring plan which locations such CWS or such NTNC will use for compliance monitoring under this subparagraph by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified under this subparagraph.

(II) If such CWS or such NTNC is a Subpart H system serving > 3,300 people, such CWS or such NTNC shall submit a copy of such CWS's or such NTNC's monitoring plan in accordance with subsection (t) of this section to the department for approval prior to the date such CWS or such NTNC conducts such CWS's or such NTNC's initial monitoring under of this subparagraph, unless such CWS's or such NTNC's IDSE report approved by the department contains all the information required by this clause.

(III) Such CWS or such NTNC may submit to the department for approval a revised monitoring plan in accordance with subsection (t) of this section if there are changes in treatment, distribution system operations and layout (including new service areas), or other factors that may affect TTHM or HAA5 formation, or for department-approved reasons after consultation with the department regarding the need for changes and the appropriateness of changes. The department may approve a revised monitoring plan in

which such CWS or such NTNC changed monitoring locations only if such CWS or such NTNC in the revised monitoring plan replaced 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 department may also require modifications in such CWS's or such NTNC's monitoring plan. Such CWS or such NTNC shall not monitor in accordance with the revised monitoring plan unless the department has approved the revised monitoring plan. If such CWS or such NTNC is a Subpart H system serving > 3,300 people, such CWS or such NTNC shall submit a copy of such CWS's or such NTNC's modified monitoring plan to the department for approval in accordance with subsection (t) of this section prior to the date such CWS or such NTNC is required to comply with the revised monitoring plan.

(iv) Reduced monitoring.

(I) Such CWS or such NTNC may reduce monitoring to the level specified in Table 11-C5 of this subclause any time the LRAA is ≤0.040 mg/l for TTHM and ≤0.030 mg/l for HAA5 at all monitoring locations. Such CWS or such NTNC may only use data collected under the provisions of subparagraph (A) or (C) of this subdivision to qualify for reduced monitoring. In addition, the source water annual average TOC level, before any treatment, shall be ≤4.0 mg/l at each treatment plant treating surface water or GWUDI, based on monitoring conducted under either subparagraph (A)(iii)(II)(1)(C) or (A)(iii)(IV) of this subdivision.

TABLE 11-C5. REDUCED MONITORING FREQUENCIES

SOURCE WATER TYPE	POPULATION SIZE CATEGORY	MONITORING FREQUENCY[1]	DISTRIBUTON SYSTEM MONITORING LOCATION PER MONITORING PERIOD
Surface Water or GWUDI	<500		Monitoring shall not be reduced.
	500 – 3,300 people	Per year	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with the highest TTHM single measurement; 1 at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	3,301 – 9,999 people	Per year	2 dual sample sets: 1 at the location and during the quarter with the highest TTHM single measurement, 1 at the location and during the quarter with the highest HAA5 single measurement.
	10,000 – 49,999 people	Per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5

			LRAAs.
	50,000 – 249,999 people	Per quarter	4 dual sample sets at the locations with the 2 highest TTHM and 2 highest HAA5 LRAAs.
	250,000 – 999,999 people	Per quarter	6 dual sample sets at the locations with the 3 highest TTHM and 3 highest HAA5 LRAAs.
	1,000,000 – 4,999,999 people	Per quarter	8 dual sample sets at the locations with the 4 highest TTHM and 4 highest HAA5 LRAAs.
	≥5,000,000 people	Per quarter	10 dual sample sets at the locations with the 5 highest TTHM and 5 highest HAA5 LRAAs.
Ground water	<500 people	Every third year	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with the highest TTHM single measurement; 1 at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	500 – 9,999 people	Per quarter	1 TTHM and 1 HAA5 sample: 1 at the location and during the quarter with the highest TTHM single measurement; 1 at the location and during the quarter with the highest HAA5 single measurement; 1 dual sample set per year if the highest TTHM and HAA5 measurements occurred at the same location and quarter.
	10,000 – 99,999 people	Per quarter	2 dual sample sets: 1 at the location and during the quarter with the highest TTHM single measurement, 1 at the location and during the quarter with the highest HAA5 single measurement.
	100,000 – 499,999 people	Per quarter	2 dual sample sets at the locations with the highest TTHM and highest HAA5 LRAAs.
	≥ 500,000 people	Per quarter	4 dual sample sets at the locations with the 2 highest TTHM and 2 highest HAA5 LRAAs.

[1] Such CWS or such NTNC on quarterly monitoring shall take dual sample sets every 90

days.

(II) Such CWS or such NTNC may remain on reduced monitoring as long as the TTHM LRAA is ≤0.040 mg/l and the HAA5 LRAA is ≤0.030 mg/l at each monitoring location (for such CWSs and such NTNCs with quarterly reduced monitoring) or each TTHM sample is ≤0.060 mg/l and each HAA5 sample is ≤0.045 mg/l (for such CWSs and such NTNCs with annual or less frequent monitoring). In addition, the source water annual average TOC level, before any treatment, shall be ≤4.0 mg/l at each treatment plant treating surface water or GWUDI based on monitoring conducted under either subparagraph (A)(iii)(II)(1)(C) or (A)(iii)(IV) of this subdivision.

(III) 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, is >4.0 mg/l at any treatment plant treating surface water or GWUDI, such CWS or such NTNC shall resume routine monitoring under clause (ii) of this subparagraph or begin increased monitoring if this clause applies.

(IV) The department may return such CWS or such NTNC to routine monitoring if such CWS or such NTNC:

(1) Violated the MCL for either TTHM or HAA5 at any monitoring location;

(2) Activated a new disinfection treatment system;

(3) Changed disinfection practices; or

(4) Reactivated an inactive disinfection treatment system.

(v) Additional requirements for consecutive systems. If such CWS or such NTNC is 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, such CWS or such NTNC shall comply with analytical and monitoring requirements for chlorine and chloramines in 40 CFR 141.131(c), as amended from time to time, and subparagraph (A)(iii)(III)(1l) of this subdivision, the compliance requirements in subparagraph (A)(iv)(III)(1) of this subdivision, and report monitoring results under subsection (h)(7)(A)(i)(I) of this section.

(vi) Conditions requiring increased monitoring.

(I) If such CWS or such NTNC is required to monitor at a particular location annually or less frequently than annually under clause (ii) or (iv) of this subparagraph, such CWS or such NTNC shall 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.

(II) Such CWS or such NTNC is in violation of the MCL when the LRAA exceeds the MCLs in Table 11-B1 of subparagraph (B)(i) of this subdivision, calculated based on 4 consecutive quarters of monitoring (or the LRAA calculated based on fewer than 4 quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters). Such CWS or such NTNC is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA, if such CWS or such NTNC fails to monitor that quarter.

(III) Such CWS or such NTNC may return to routine monitoring once such CWS or such NTNC has conducted increased monitoring for at least 4 consecutive quarters and the

LRAA for every monitoring location is ≤0.060 mg/l for TTHM and ≤0.045 mg/l for HAA5.

(vii) Operational evaluation levels.

(I) The operational evaluation level for TTHM and HAA5 is the sum of the 2 previous quarterly results plus twice the current quarter's result, divided by 4. Each quarter, such CWS or such NTNC shall calculate the TTHM and HAA5 operational evaluation levels for each monitoring location.

(II) Such CWS or such NTNC has exceeded the operational evaluation level at any monitoring location where the sum of the 2 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 2 previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average, exceeds 0.060 mg/l.

(III) (1) If such CWS or such NTNC exceeds the operational evaluation level, such CWS or such NTNC shall conduct an operational evaluation and submit a written report of the evaluation to the department for approval in accordance with subsection (t) of this section not later than 90 days after being notified of the analytical result that causes such CWS or such NTNC to exceed the operational evaluation level. The written report shall be made available to the public upon request.

(2) Such CWS's or such NTNC's operational evaluation shall include an examination of such CWS's or such NTNC's treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in sources or source water quality, and treatment changes or problems that may contribute to TTHM and HAA5 formation and what steps could be considered to minimize future exceedances.

(A) Such CWS or such NTNC may submit an application to the department for approval requesting that the department permit such CWS or such NTNC to limit the scope of such CWS's or such NTNC's evaluation if such CWS or such NTNC is able to identify the cause of the operational evaluation level exceedance. Such application shall include the reason or reasons that such CWS or such NTNC is requesting to limit the scope of such CWS's or such NTNC's evaluation, including the identification of the cause of the operational evaluation level exceedance, and shall be submitted in accordance with subsection (t) of this section. Such CWS or such NTNC shall keep the department-approved application with the completed report.

(B) Such CWS's or such NTNC's request to limit the scope of the evaluation does not extend the time in subclause (III)(1) of this clause by which such CWS or such NTNC is required to submit to the department for approval the written report.

(viii) Requirements for remaining on reduced TTHM and HAA5 monitoring based on results under subparagraph (A) of this subdivision. Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, may remain on reduced monitoring after the date identified in clause (i)(III)(3) of this subparagraph for compliance with this subparagraph if such CWS or such NTNC has a 40/30 certification previously approved by the department under 40 CFR 141.603 or such CWS or such NTNC serves fewer than 500 people, has taken TTHM and HAA5 samples under subparagraph (A) of this subdivision and was previously granted a very small system waiver by the department under 40 CFR

141.604 and such CWS or such NTNC meets the reduced monitoring criteria in clause (iv)(I) of this subparagraph, and does not change or add monitoring locations from those used for compliance monitoring under subparagraph (A) of this subdivision. If the monitoring locations under this subparagraph of such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, differ from such CWS's or such NTNC's monitoring locations under subparagraph (A) of this subdivision, such CWS or such NTNC shall not remain on reduced monitoring after the date identified in clause (i)(III)(3) of this subparagraph for compliance with this subparagraph.

(ix) Requirements for remaining on increased TTHM and HAA5 monitoring based on results under subparagraph (A) of this subdivision. If such CWS or such NTNC was on increased monitoring under subparagraph (A)(iii)(II)(1) of this subdivision, such CWS or such NTNC shall remain on increased monitoring until such CWS or such NTNC qualifies for a return to routine monitoring under clause (vi)(III) of this subparagraph. Such CWS or such NTNC that serves < 10,000 people and for which Cryptosporidium monitoring is required under 40 CFR 141.701(a)(4), as amended from time to time, shall conduct increased monitoring under clause (vi) of this subparagraph at the monitoring locations in such CWS's or such NTNC's department-approved monitoring plan under clause (iii) of this subparagraph beginning on the date identified in clause (i)(III)(3) of this subparagraph for compliance with this subparagraph and remain on increased monitoring until such CWS or such NTNC qualifies for a return to routine monitoring under clause (vi)(III) of this subparagraph.

(12) Ground water source microbial monitoring and analytical requirements.

(A) Applicability. This subdivision applies to all ground water systems.

(B) General requirements. Systems subject to this subdivision, subdivision (7)(E) of this subsection and subsection (j)(14) of this section shall comply with the following requirements:

(i) Sanitary survey information requirements for all ground water systems as described in subdivision (7)(E) of this subsection.

(ii) Microbial source water monitoring requirements for ground water systems that do not treat all of the system's ground water to at least 99.99 percent (4 log) treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer as described in subparagraph (C) of this subdivision.

(iii) Treatment technique requirements, described in subsection (j)(14) of this section, that apply to ground water systems that have fecally contaminated source waters, as determined by source water monitoring conducted under subparagraph (C) of this subdivision. A ground water system with fecally contaminated source water subject to the treatment technique requirements of this subdivision and subsection (j)(14) of this section shall implement 1 or more of the following corrective action options:

(I) Correct all significant deficiencies;

(II) Provide an alternate source of water;

(III) Eliminate the source of contamination; or

(IV) Provide treatment that reliably achieves at least 4 log treatment of viruses using

inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the ground water source.

(iv) Ground water systems that provide at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer of a ground water source are required to conduct compliance monitoring at that source to demonstrate treatment effectiveness, as described in subsection (j)(14)(B) of this section.

(v) If requested by the department, ground water systems shall provide the department with any existing information that will enable the department to perform a HSA.

(vi) Regardless of whether the ground water system is a CWS or a NTNC, if such ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer, such ground water system shall employ, contract with or otherwise utilize an operator certified pursuant to subsection 25-32-9 of the Regulations of Connecticut State Agencies.

(C) Triggered source water monitoring.

(i) General requirements.

(I) E. coli is the fecal indicator for triggered source water monitoring under this subparagraph, unless the department specifies another fecal indicator that shall be used.

(II) A ground water system shall conduct triggered source water monitoring if the following conditions exist:

(1) The ground water system does not provide at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for each ground water source that the department has approved under subsection (j)(14)(B)(i) or (ii) of this section; and

(2) The ground water system is notified that a sample collected under subdivision (7)(A) or (B) of this subsection is total coliform-positive and the sample is not invalidated by the department under subdivision (7)(F) of this subsection.

(ii) Sampling requirements. A ground water system shall collect, not later than 24 hours after notification of a total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection, at least 1 ground water source sample from each ground water source in use at the time the total coliform-positive sample was collected under subdivision (7)(A) or (B) of this subsection, except as provided in subclause (II) of this clause. For purposes of this clause, the term "in use" means the ground water source had the capacity to provide water to the monitoring site at the time the total coliform-positive sample was collected under subdivision (7)(A) or (B) of this subsection.

(I) The department may extend the 24-hour time limit if the ground water system cannot collect the ground water source sample within 24 hours due to circumstances beyond the ground water system's control. A ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting an extension beyond the 24-hour time limit, specifying the circumstances beyond the ground water system's control that prevent such ground water system from collecting a ground water source sample not later than 24 hours after notification of the total coliform-positive sample. The ground water system shall file such application with the department not later than 24 hours after

being notified of the total coliform-positive sample. If the department's office is closed at that time, the ground water system shall file such application with the department before the end of the next business day. The department shall not grant an extension of more than 72 hours, thereby approving the system to collect the ground water source sample not later than 96 hours after notification of the total coliform-positive sample, unless the ground water system in the ground water system's application provides evidence that the ground water system's contract laboratory is closed for the weekend or a holiday and the closure will prevent such ground water system from collecting the ground water source sample not later than 96 hours after being notified of the total coliform-positive sample.

(II) If approved by the department, ground water systems with more than 1 ground water source may meet the requirements of this clause by sampling a representative ground water source or sources. A ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting approval to meet the requirements of this clause by sampling a representative ground water source or sources. Ground water systems shall include with the application a triggered source water monitoring plan that identifies all of the ground water sources that are representative of each distribution system monitoring site in the ground water system's sample siting plan under subdivision (7)(D)(i) of this subsection and that the ground water system intends to use for representative sampling under this subclause. Such plan shall include all of the ground water sources that supply each of the distribution system monitoring sites in the ground water system's sample siting plan under subdivision (7)(D)(i) of this subsection under normal operating conditions. A ground water system shall not meet the requirements of this clause by sampling a representative ground water source or sources until the ground water system has received department approval of the ground water system's application.

(III) A ground water system serving 1,000 people or fewer may use a sample collected from a ground water source to meet both the requirements of subdivision (7)(G)(i) of this subsection and to satisfy the monitoring requirements of this clause if the department-approved fecal indicator under clause (i)(I) of this subparagraph is E. coli. If the sample collected from the ground water source is E. coli positive, the ground water system shall comply with the requirements of clause (iii) of this subparagraph. The ground water system shall also comply with the requirements of subdivision (7)(G) of this subsection, if applicable.

(iii) Additional requirements. If the department does not require corrective action under subsection (j)(14)(A) of this section for a fecal indicator-positive source water sample collected under clause (ii) or (iv) of this subparagraph that is not invalidated under subparagraph (F) of this subdivision or if the department does not invalidate a fecal indicator-positive source water sample collected under subparagraph (D)(ii) or (I) of this subdivision, the ground water system shall collect 5 additional source water samples from the same source not later than 24 hours after being notified of a fecal indicator-positive sample collected under subparagraphs (C)(ii), (C)(iv), (D)(ii) or (I) of this subdivision. If a ground water system is unable to collect the additional source water samples not later than 24 hours after being notified of the fecal indicator-positive sample, the ground water system shall submit an application to the department requesting an extension beyond the 24-hour time limit. Such application shall include documentation demonstrating that the

ground water system's contract laboratory is closed for the weekend or a holiday and the closure will prevent such ground water system from collecting the ground water source sample not later than 24 hours after being notified of the fecal indicator-positive sample, and shall be submitted in accordance with subsection (t) of this section. The ground water system shall file such application with the department not later than 24 hours after being notified of the fecal indicator-positive sample. If the department's office is closed at that time, the ground water system shall file such application with the department before the end of the next business day. The department shall not grant an extension of more than 72 hours, thereby approving the ground water system to collect the ground water source sample not later than 96 hours after notification of the fecal indicator-positive sample.

(iv) Consecutive and wholesale systems.

(I) In addition to the other requirements in this subparagraph, a consecutive public water system served by a ground water source or sources that that has a total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection shall notify the wholesale system or systems not later than 24 hours after being notified of the total coliform-positive sample, unless the wholesale system's office is closed at that time, in which case the consecutive public water system served by a ground water source or sources shall notify those wholesale system or systems before the end of the next business day.

(II) In addition to the other requirements in this subparagraph, a wholesale ground water system shall comply with the following requirements:

(1) A wholesale system served by a ground water source or sources that receives notice from a consecutive system it serves that a sample collected under subdivision (7)(A) or (B) of this subsection is total coliform-positive shall, not later than 24 hours after being notified, collect a sample from the wholesale ground water system's ground water source or sources under clause (ii) of this subparagraph and analyze the sample for a fecal indicator in accordance with the analytical methods in subparagraph (E) of this subdivision.

(2) If the sample collected under subclause (II)(1) of this clause is fecal indicator-positive, the wholesale system served by a ground water source or sources shall notify all consecutive systems served by that ground water source of the fecal indicator source water positive not later than 24 hours after being notified of the ground water source sample monitoring result, unless 1 or more of the consecutive systems' offices are closed at that time, in which case the wholesale system served by a ground water source or sources shall notify those consecutive systems before the end of the next business day, and shall meet the requirements of clause (iii) of this subparagraph.

(v) Exceptions to the triggered source water monitoring requirements. A ground water system is not required to comply with the source water monitoring requirements of this subparagraph if any of the following conditions exist:

(I) The department determines that the total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection is caused by a previously-documented distribution system deficiency. A ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting a determination from the department whether the total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection was caused by a distribution system deficiency. The application shall include documentation demonstrating that the distribution system

deficiency that caused the total coliform-positive sample was previously documented. Documentation that the distribution system deficiency was previously documented includes, but is not limited to, distribution system sampling results, repair records, facility inspection reports, cross connection surveys, and documentation of areas of low pressure. The ground water system shall submit such application to the department before the total coliform-positive sample result is received by the department;

(II) The department determines that the total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection was collected at a location in the distribution system that has a condition that will cause total coliform-positive samples. A ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting a determination from the department whether the total coliform-positive sample collected under subdivision (7)(A) or (B) of this subsection was collected at a location in the distribution system that has a condition that will cause total coliform-positive samples. Such application shall include documentation demonstrating that the condition in the distribution system will cause a total coliform-positive sample. Documentation that a condition in the distribution system caused the total coliform-positive sample includes, but is not limited to, documentation of recurring bio-film problems. The ground water system shall submit such application to the department before the total coliform-positive sample result is received by the department; or

(III) The ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for each ground water source that the department has approved under subsection (j)(14)(B)(i) or (ii) of this section.

(D) Assessment source water monitoring.

(i) The department shall specify the fecal indicator or indicators for which the ground water system shall sample for assessment source water monitoring under this subparagraph.

(ii) The department may require a ground water system to conduct assessment source water monitoring in accordance with the requirements in clause (iii) of this subparagraph if the ground water system meets 1 of the following criteria:

(I) A ground water source, based on the ground water source's stabilized pumping rate, does not meet the separating distances from sources of pollution that cause or may cause fecal contamination, as shown in Table 12-D1 of this subclause. Such sources of pollution may include, but are not limited to, systems for the disposal or storage of sewage, sewer lines, and stables, pigpens, chicken houses or other structures or locations where fecal matter is allowed to accumulate, as shown in Table 12-D1 of this subclause.

TABLE 12-D1. SEPARATING DISTANCE REQUIREMENTS BASED ON REQUIRED WITHDRAWAL RATE OF GROUND WATER SOURCE

STABILIZED PUMPING RATE OF GROUND WATER SOURCE	SEPARATING DISTANCES FROM THE GROUND WATER SOURCE TO SOURCES OF POLLUTION
Under 10 gallons per minute (gpm)	75 feet
10 to 50 gpm	150 feet

>50 gpm	200 feet

(II) A ground water source is currently disinfected by a ground water system using chlorine, UV, ozone or some other disinfectant or disinfectants, the department has not approved the treatment under subsection (j)(14)(B)(i) or (ii) of this section, and the ground water system does not have a department-approved source water fecal indicator monitoring plan under subparagraph (I) of this subdivision.

(III) A ground water system has 2 or more MCL violations for total coliform within a 12 month period. If the department determines that the ground water system's MCL violations for total coliform are caused by a previously-documented distribution system deficiency, then the ground water system shall not be required to conduct assessment source water monitoring under this clause. A ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting a determination from the department whether the MCL violations for total coliform were caused by a previously-documented distribution system deficiency. Such application shall include documentation demonstrating that the distribution system deficiency that caused the MCL violations for total coliform was previously documented. Documentation demonstrating that the distribution system deficiency was previously documented includes, but is not limited to, distribution system sampling results, repair records, facility inspection reports, cross connection surveys, and documentation of areas of low pressure.

(IV) The department determines after an investigation that the ground water source or sources are susceptible to contamination by microbial pathogens, based on a HSA.

(V) A ground water system's 5 samples collected in accordance with subparagraph (C)(iii) of this subdivision were all fecal indicator-negative.

(VI) A ground water system discontinues the ground water system's department-approved 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source.

(iii) If required by the department under clause (ii) of this subparagraph to conduct assessment source water monitoring on 1 or more ground water sources, the ground water system shall conduct such monitoring in accordance with the requirements in subclauses (I) through (V), inclusive, of this clause. A ground water system conducting assessment source water monitoring may use a triggered source water sample collected under subparagraph (C) of this subdivision to meet the requirements of this clause.

(I) Collection of a total of 12 ground water source samples that represent each month the ground water system provides ground water to the public. If a ground water system provides ground water to the public for less than 12 months, the ground water system shall collect samples during the months in which the ground water system provides ground water to the public until the ground water system has collected a minimum of 12 samples. If the department determines that there is a continued risk of introduction of fecal contamination into the ground water the ground water system provides to the public or that 1 or more of the conditions in clauses (ii)(I) through (V), inclusive, of this subparagraph continues to exist, the department may require the ground water system to continue to conduct assessment source water monitoring after the ground water system has collected a total of

12 ground water source samples. If the department determines that a frequency other than the collection of 1 sample in each month the ground water system provides ground water to the public will provide a more accurate representation of the water quality of the ground water source or sources or if the ground water system operates for only part of the year, the department may modify the frequency of the sampling. For purposes of this subclause, a ground water system operates for only part of the year if the ground water system is in operation for less than 12 months out of a year;

(II) Collection of samples from each active source of supply;

(III) Collection of a standard sample volume of at least 100 ml for fecal indicator analysis regardless of the fecal indicator or analytical method used;

(IV) Analysis of all ground water source samples using 1 of the analytical methods listed in subparagraph (E)(ii) of this subdivision for the presence of E. coli, enterococci, or coliphage; and

(V) Collection of ground water source samples at a location prior to any treatment of the ground water source.

(iv) The department may at any time terminate the requirement that a ground water system conduct assessment source water monitoring. If the department requires the ground water system to take corrective action under subsection (j)(14)(A)(i) of this section at a source at which the ground water system is conducting assessment source water monitoring, the ground water system shall not be required to continue source water assessment monitoring for that ground water source unless directed to do so by the department.

(v) A ground water system that has received department-approval of the ground water system's treatment under subsection (j)(14)(B)(i) or (ii) of this section because the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a specified ground water source, shall not be required by the department to conduct assessment source water monitoring under this subparagraph for the specified ground water source. If the ground water system subsequently discontinues the department-approved 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a specified ground water source after receiving approval from the department under subsection (j)(14)(C) of this section, the department may require the ground water system to conduct assessment source water monitoring under clause (ii) of this subparagraph for that ground water source. A ground water system that discontinues 4 log treatment of viruses is subject to the triggered source water monitoring requirements of subsection (C) of this subdivision and analytical methods requirements in subparagraph (e)(12)(E) of this subdivision.

(E) Source water monitoring analytical methods.

(i) A ground water system subject to the source water monitoring requirements of this subdivision shall collect a standard sample volume of at least 100 ml for fecal indicator analysis regardless of the fecal indicator or analytical method used.

(ii) A ground water system shall analyze all ground water source samples collected under this subdivision using 1 of the analytical methods listed in 40 CFR 141.402(c)(2), as amended from time to time, or 1 of the alternative testing methods listed in 40 CFR 141,

Subpart C, Appendix A, as amended from time to time, for the presence of E. coli, enterococci, or coliphage.

(F) Invalidation of a fecal indicator-positive ground water source sample.

(i) A ground water system may submit an application to the department in accordance with subsection (t) of this section requesting invalidation of a fecal indicator-positive ground water source sample collected under subparagraph (C) of this subdivision. Such application shall include documentation demonstrating compliance with 1 or more of the conditions in subclause (I) or (II) of this clause. The department may invalidate a fecal indicator-positive ground water source sample collected under subparagraph (C) of this subdivision only if the ground water system satisfies 1 of the following conditions:

(I) The ground water system submits to the department a written notice from the laboratory that improper sample analysis occurred; or

(II) The ground water system submits to the department substantial evidence that the fecal indicator-positive ground water source sample is not related to source water quality and the department determines and documents in writing that such substantial evidence exists. Substantial evidence shall include, but is not limited to, documentation, such as photographs and operator and ground water system reports, of defects or damage to the ground water system that caused water that is not representative of the source to be collected at the dedicated source water tap.

(ii) If the department invalidates a fecal indicator-positive ground water source sample, the ground water system shall collect another source water sample under subparagraph (C) of this subdivision not later than 24 hours after being notified by the department of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph and have the sample analyzed for the same fecal indicator using the analytical methods in subparagraph (E) of this subdivision. The department may extend the 24-hour time limit if the ground water system cannot collect the ground water source sample within 24 hours due to circumstances beyond the ground water system's control. A ground water system shall submit an application to the department requesting an extension beyond the 24-hour time limit. Such application shall include an explanation with supporting documentation of the circumstances beyond the ground water system's control that prevent such ground water system from collecting a ground water source sample not later than 24 hours after notification of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph, and shall be submitted in accordance with subsection (t) of this section. The ground water system shall submit such application to the department not later than 24 hours after the ground water system's notification of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph. If the department's office is closed at that time, the ground water system shall submit such application to the department before the end of the next business day after the ground water system's notification of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph. The department shall not grant an extension of more than 72 hours, thereby approving the ground water system to collect the ground water source sample not later than 96 hours after notification of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph, unless the ground water system in the ground water

system's application provides evidence that the ground water system's contract laboratory is closed for the weekend or a holiday and the closure will prevent such ground water system from collecting the ground water source sample not later than 96 hours after being notified of the department's approval of the ground water system's application submitted under clause (i) of this subparagraph.

(G) Sampling location. Any ground water source sample required under subparagraph (C) of this subdivision shall be collected at a location prior to any treatment of the ground water source unless the department approves a sampling location after treatment. If a ground water system wants to collect a ground water source sample at a sampling location after treatment, the ground water system shall submit an application to the department requesting approval of that sampling location in accordance with subsection (t) of this section.

(H) New sources. A ground water system that places a new ground water source into service shall conduct assessment source water monitoring in accordance with the requirements in subparagraphs (D)(iii)(II) through (V), inclusive, of this subdivision. The ground water system shall collect and have analyzed 1 source sample before the new ground water source is used to provide water to the public. If directed by the department, the ground water system shall continue assessment source water monitoring in accordance with the requirements in subparagraph (D)(iii) of this subdivision.

(I) Source water fecal indicator monitoring plan. If a ground water system currently disinfects a ground water source or sources using chlorine, UV, ozone or some other disinfectant or disinfectants, but such treatment has not been approved by the department under subsection (j)(14)(B)(i) or (ii) of this section, the department shall not require the ground water system to conduct assessment source water monitoring under subparagraph (D)(ii)(II) of this subdivision if the ground water system has a department-approved source water fecal indicator monitoring plan and such ground water system samples in accordance with such source water fecal indicator monitoring plan. To obtain approval of a source water fecal indicator monitoring plan, a ground water system shall submit the plan to the department for approval in accordance with subsection (t) of this section. Such plan shall include information on the location, sampling technique and protocols, and frequency of sampling, the methodology used for the analysis of the samples collected, and the format and timing of the ground water system's submission of sampling results. For purposes of this subparagraph, the term "source water fecal indicator monitoring plan" shall mean a plan prepared by a ground water system that identifies the ground water source or sources the ground water system will sample, the frequency with which the ground water system will sample such sources, the location at which such sampling shall occur, which location shall be prior to any treatment and in a location that excludes from sampling water from storage tanks or from the distribution system, and that provides information on the ground water system's submission of sampling results to the department.

(J) Any ground water system that collects a sample under subparagraph (D) or (I) of this subdivision that is fecal indicator-positive shall collect 5 additional source water samples from the same source in accordance with subparagraph (C)(iii) of this subdivision. If any of the 5 additional source water samples collected in accordance with subparagraph (C)(iii) of this subdivision are fecal indicator-positive, the ground water system shall implement 1 or more corrective actions in accordance with subsection (j)(14)(A) of this section.

(K) Public notification. A ground water system with a ground water source sample collected under subparagraph (C) or (D) of this subdivision that is fecal indicator-positive and that is not invalidated under subparagraph (F) of this subdivision, including consecutive systems served by a ground water source, shall conduct public notification under subsection (i)(1) of this section.

(L) Monitoring violations. Failure to meet the requirements of subparagraphs (C) through (I), inclusive, of this subdivision is a monitoring violation and requires the ground water system to provide public notification under subsection (i)(3) of this section.

(f) **Protection of distribution system.**

(1) All service connections shall have a water pressure at the main of at least 25 psi under normal conditions. Where pressure is normally less than 25 psi, special provision as approved by the department, shall be made to furnish adequate service to the consumer.

(2) Each public water system which serves water to any of the consumer premises listed in subparagraph (a) of this subdivision shall report the following information to the Department by March 1 of each year covering the preceding calendar year, or upon notification by the department.

(A) A list of all consumer premises where the following categories of concern are known to exist:

1. Any water supply source other than that of the public water system is known to exist.

2. Toxic or objectionable chemical or biological substances are used in water solution on public, commercial or industrial premises.

3. Water pressure is raised by pumping on other than residential premises above that furnished by the supplier.

4. There is a water storage tank, public swimming pool or water filter, for other than residential use.

5. There is known to be a sprinkler system for either fire protection or irrigation. This list shall identify the category or categories of concern for each premise listed.

(B) Date of last inspection of each consumer premises listed in item (A). Also, the number of violations detected of the Public Health Code regulations relating to water distribution systems, and the status of correction of these violations. Listings under item (A)(2) shall be inspected at least once each year and the remaining items shall be inspected at least once every five years. At premises where the public water system has determined a reduced pressure principle backflow preventer, double check valve assembly or pressure vacuum breaker is required, the type(s) of device(s) shall be specified and a summary of test results shall be included.

(3) Each public water system which serves water to any of the consumer premises listed in subdivision (2)(a) of this subsection shall have those premises inspected for cross connections by a person who has met the requirements of section 25-32-11(h) of the Regulations of Connecticut State Agencies.

(4) Each public water system which does not serve water to any of the consumer premises listed in subdivision (2)(a) of this subsection shall verify to the department that it does not serve water to any of those premises. The system shall provide such verification on a form provided by the department by March 1, 2002, and every five years thereafter.

(5) Finished water storage tanks, basins and clearwells.

(A) All finished water storage tanks, basins and clearwells connected to a public water distribution system shall be constructed and located so as to adequately protect the water from contamination. Finished water storage tanks, basins and clearwells shall be properly constructed in a sanitary manner to prevent stormwater and precipitation from entering; and vents and overflows shall be provided and suitably protected and screened to prevent entry of insects, birds or other foreign matter. Overflow pipes shall not be directly connected to sanitary sewers or to storm drainage systems.

(B) In-ground finished water clearwells, basins or tanks shall be at least fifty feet from any part of the nearest subsurface sewage disposal system and twenty-five feet from the nearest watercourse or storm drain or other source of pollution. They shall be at least fifty feet from the nearest sanitary sewer unless the sewer is constructed in accordance with the technical standards for subsurface sewage disposal systems pursuant to section 19-13-B103d of the Regulations of Connecticut State Agencies, in which case it may be no closer than twenty-five (25) feet. Exemptions may be sought for existing structures which do not conform to these requirements.

(C) All atmospheric finished water storage tanks, basins and clearwells shall be inspected at a minimum of once every ten years for sanitary conditions and structural integrity. The inspection report shall be retained for reference and submitted to the department upon request.

(D) Uncovered finished water clearwells, tanks and basins are prohibited.

(6) An annual distribution system flushing program shall be conducted to maintain the distribution system free from excessive accumulation of sediment, organic growths, products of corrosion and erosion, and other extraneous matter. The program shall be made available to the department upon request.

(g) **Laboratory and operating tests.** Water samples taken to conform with the monitoring requirements of this section shall be analyzed and reported to the system by a laboratory issued a certificate of approval by the department pursuant to section 19a-29a of the Connecticut General Statutes and certified by the department for the parameters tested. Laboratory techniques shall conform to those approved by the EPA. The department may grant an exemption from this requirement in writing for disinfectant residuals, pH, temperature, turbidity, fluoride, but only for fluoride samples that are taken and analyzed under subsection (e)(7)(L) of this section, and color when the analysis is conducted by a certified water treatment plant operator using a method approved by the department. Continuous analyzers may be used provided the instruments used are approved by the department and are maintained by a certified water treatment plant operator or technical personnel employed by a laboratory that has a certificate of approval that was issued by the department pursuant to section 19a-29a of the Connecticut General Statutes.

(h) **Reporting of tests.**

(1) A system that has exceeded the MCL for total coliforms or a ground water system that has collected a source water sample under subsections (e)(12)(C) or (e)(12)(D) of this section that is fecal indicator-positive shall report the violation or the fecal indicator-positive sample in writing to the department and the local director of health of each city, town, borough, or district served by the system not later than the end of the next business day after the system learns of the violation or fecal indicator-positive sample, and shall provide

notice to the public in accordance with subsection (i) of this section.

(2) A system that has failed to comply with a monitoring requirement under subsections (e)(6) and (e)(7) of this section shall report the monitoring violation in writing to the department not later than 10 days after the system discovers the violation, and shall provide notice to the public in accordance with subsection (i) of this section.

(3) Except where a different reporting period is specified in this section, a system shall report to the department and the local director of health of each city, town, borough, or district served by the system not later than 48 hours after the failure to comply with any established MCL.

(4) A system shall report to the department not later than 9 calendar days after the end of each month the results of samples that are collected during such month in compliance with the monitoring requirements of this section. The report shall be in a format and manner prescribed by the department and shall contain the results of required samples that are collected during the month in compliance with monitoring requirements of this section.

(5) Lead and copper. All CWSs and NTNCs shall report all of the following information to the department in accordance with this subdivision. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.

(i) Unless the department has specified a more frequent reporting requirement, a CWS or NTNC shall report the information specified in this clause for all tap water samples specified in subsection (e)(8) of this section and for all water quality parameter samples specified in subsection (e)(9) of this section not later than 9 calendar days after the end of each applicable monitoring period specified in subsections (e)(8) and (e)(9) of this section. For monitoring periods with a duration less than 6 months, the end of the monitoring period is the last date samples may be collected during that period as specified in subsections (e)(8) and (e)(9) of this section.

(I) The results of all tap water samples for lead and copper including the location of each site and the criteria under subsection (e)(8)(A) of this section under which the site was selected for the CWS's or NTNC's sampling pool; upon request of the department, a certification that each first-draw sample collected by the CWS or NTNC is 1 liter in volume and, has stood motionless in the service line, or in the interior plumbing of a sampling site, for at least 6 hours; where residents collected samples, a certification that each tap water sample collected by the residents was taken after the CWS or NTNC informed them of proper sampling procedures specified in subsection (e)(8)(B)(ii) of this section;

(II) Documentation for each tap water lead or copper sample for which the CWS or NTNC requests invalidation pursuant to subsection (e)(8)(F)(ii) of this section;

(III) The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with subsection (j)(6)(B)(iii) of this section);

(IV) With the exception of initial tap water sampling conducted pursuant to subsection (e)(8)(D)(i) of this section, the CWS or NTNC shall designate any site which was not sampled during previous monitoring periods, and include an explanation of the reason that sampling sites have changed;

(V) The results of all tap water samples for pH, and where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under subsections (e)(9)(B) through (E), inclusive, of this section;

(VI) The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under subsections (e)(9)(B) through (E), inclusive, of this section; and

(VII) The results of all water quality parameter samples collected under subsections (e)(9)(C) through (F), inclusive, of this section during each 6 month monitoring period specified in subsection (e)(9)(D) of this section not later than the first 9 calendar days after the end of the monitoring period unless the department has specified a more frequent reporting requirement.

(ii) For a NTNC, or a CWS meeting the criteria of subsection (i)(6)(B)(vii) of this section, that does not have enough taps that can provide first-draw samples, the CWS whose operation mandates continuous daily flow or NTNC shall identify, in writing, each site that did not meet the 6 hour minimum standing time and the length of standing time for that particular substitute sample collected pursuant to subsection (e)(8)(B)(v) of this section and include this information with the lead and copper tap water sample results required to be submitted pursuant to subclause (i) of this subparagraph.

(iii) At a time specified by the department, or if no specific time is designated by the department, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a CWS or NTNC deemed to have optimized corrosion control under subsection (j)(7)(B)(iii) of this section or a CWS or NTNC subject to reduced monitoring pursuant to subsection (e)(8)(D)(iv) of this section, shall submit an application to the department requesting approval of the addition of a new source or long-term change in water treatment. Such application shall be submitted in accordance with subsection (t) of this section and shall include a description of the long-term change in water treatment or addition of the new source. The CWS's or NTNC's addition of a new source or long-term change in water treatment shall be approved by the department before it is implemented by the CWS or NTNC. Examples of long-term changes in water treatment include, but are not limited to, the addition of a new treatment process or modification of an existing treatment process. Examples of modifications of an existing treatment process include, but are not limited to, switching secondary disinfectants, switching coagulants (e.g., alum to ferric chloride), and switching corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes in water treatment may include dose changes to existing chemicals if the CWS or NTNC is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes in water treatment do not include chemical dose fluctuations associated with daily raw water quality changes.

(B) Source water reporting requirements:

(i) A CWS or NTNC shall report the sampling results for all source water samples collected in accordance with subsection (e)(10) of this section not later than the first 10 calendar days after the end of each source water monitoring period (i.e., annually, per compliance period, per compliance cycle) specified in subsections (e)(10)(A) through (D), inclusive, of this section.

(ii) With the exception of the first round of source water sampling conducted pursuant

to subsection (e)(10)(B) of this section, the CWS or NTNC shall specify any site which was not sampled during previous monitoring periods, and include an explanation of the reason that the sampling point has changed.

(C) Corrosion control treatment reporting requirements. By the applicable dates under subsection (j)(7) of this section, a CWS or NTNC shall report the following information to the department:

(i) For CWSs and NTNCs demonstrating that the CWS or NTNC has already optimized corrosion control, information required in subsection (j)(7)(B) of this section;

(ii) For CWSs and NTNCs required to optimize corrosion control, the CWS's or NTNC's recommendation regarding optimal corrosion control treatment under subsection (j)(8)(A) of this section;

(iii) For CWSs and NTNCs required to evaluate the effectiveness of corrosion control treatments under subsection (j)(8)(C) of this section the information required by subsection (j)(8)(C) of this section; and

(iv) For CWSs and NTNCs required to install optimal corrosion control approved by the department under subsection (j)(8)(D) of this section, a letter certifying that the CWS or NTNC has completed installing that treatment.

(D) Source water treatment reporting requirements. By the applicable dates in subsection (j)(9) of this section, CWSs and NTNCs shall report the following information to the department:

(i) If required under subsection (j)(9)(B)(i) of this section, the CWS's or NTNC's proposal regarding source water treatment; and

(ii) For CWSs and NTNCs required to install source water treatment under subsection (j)(9)(B)(ii) of this section, a letter certifying that the CWS or NTNC has completed installing the treatment approved by the department not later than 24 months after the department approved the treatment.

(E) Lead service line replacement reporting requirements. A CWS or NTNC shall report the following information to the department to demonstrate compliance with the requirements of subsection (j)(10) of this section:

(i) Not later than 12 months after the end of the monitoring period in which a CWS or NTNC exceeds the lead action level in sampling referred to in subsection (j)(10)(A) of this section, the CWS or NTNC shall submit in writing to the department documentation demonstrating that a material evaluation was conducted under subsection (e)(8)(A) of this section, including, but not limited to, the evaluation conducted under subsection (e)(8)(A)(i) of this section, a document identifying the initial number of lead service lines in the CWS's or NTNC's distribution system at the time the CWS or NTNC exceeded the lead action level, and the CWS's or NTNC's schedule for annually replacing at least 7 percent of the initial number of lead service lines in the CWS's or NTNC's distribution system.

(ii) Not later than 12 months after the end of the monitoring period in which a CWS or NTNC exceeds the lead action level in sampling referred to in subsection (j)(10)(A) of this section, and every 12 months thereafter, the CWS or NTNC shall demonstrate in writing to the department that the CWS or NTNC has either:

(I) Replaced in the previous 12 months at least 7 percent of the initial lead service lines or a greater number of lines specified by the department under subsection (j)(10)(E) of this

section in the CWS's or NTNC's distribution system; or

(II) Conducted sampling that demonstrates that the lead concentration in all service line samples from individual line(s), taken pursuant to subsection (e)(8)(B)(iii) of this section, is less than or equal to 0.015 mg/l. In such cases, the total number of lines replaced or that meet the criteria in subsection (j)(10)(C) of this section, or both, shall equal at least 7 percent of the initial number of lead lines identified under clause (i) of this subparagraph or the percentage of lines specified by the department under subsection (j)(10)(E) of this section.

(iii) The written documentation submitted annually to the department by the CWS or NTNC under clause (ii) of this subparagraph shall contain the following information:

(I) The number of lead service lines that were scheduled to have been replaced during the previous year of the CWS's or NTNC's replacement schedule;

(II) The number and location of each lead service line replaced during the previous year of the CWS's or NTNC's replacement schedule; and

(III) If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(iv) Any CWS or NTNC which collects lead service line samples following partial lead service line replacement, required by subsection (j)(10) of this section, shall report the results to the department not later than 9 calendar days after the end of the month in which the CWS or NTNC receives the laboratory results, or as specified by the department. CWSs and NTNCs shall also report any additional information as specified by the department, in a time and manner prescribed by the department, to verify that all partial lead service line replacement activities have taken place.

(F) Public education program reporting requirements.

(i) Any CWS or NTNC that is subject to the public education requirements in subsection (i)(6) of this section shall, not later than 9 calendar days after the end of each period in which the CWS or NTNC is required to perform public education tasks in accordance with subsection (i)(6)(B) of this section, send written documentation to the department that contains:

(I) A demonstration that the CWS or NTNC has delivered the public education materials that meet the content requirements in subsection (i)(6)(A) of this section and the delivery requirements in subsection (i)(6)(B) of this section; and

(II) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the CWS or NTNC delivered public education materials during the period in which the CWS or NTNC was required to perform public education tasks.

(ii) Not later than 3 months after the end of the monitoring period, each CWS or NTNC shall mail a sample copy of the consumer notification of tap water results to the department along with a certification that the notification has been distributed in a manner consistent with the requirements of subsection (i)(6)(C) of this section.

(G) Reporting of additional monitoring data. Any CWS or NTNC that collects sampling data in addition to that required by this subdivision shall report the results to the department by the end of the applicable monitoring period under subsections (e)(8) and (e)(9) of this section during which the samples are collected.

(6) Reporting requirements — Surface water source and groundwater source under the direct influence of surface water.

(A) For a system with a groundwater source under the direct influence of surface water and that does not provide and operate treatment pursuant to section 19-13-B102(j)(2) of the Regulations of Connecticut State Agencies, interim reporting shall be required prior to installation of treatment. Specific requirements shall be determined on a case-by-case basis depending on raw water quality, proficiency of existing treatment, and adequate watershed protection. In addition, total coliform test results, turbidity measurements and daily test for residual chlorine as required by sections 19-13-B102(e)(7)(H) and (M) of the Regulations of Connecticut State Agencies, respectively, shall be reported to the department no later than nine (9) calendar days after the end of each month the system serves water to the public.

(B) A system that uses a surface water source or a groundwater source under the direct influence of surface water, and that provides and operates treatment pursuant to section 19-13-B102(j)(2) of the Regulations of Connecticut State Agencies, shall report monthly to the department the information specified in the following sub clauses.

(i) Combined filtered water turbidity measurements as required by section 19-13-B102(e)(7)(S)(i) of the Regulations of Connecticut State Agencies shall be reported to the department within nine (9) calendar days after the end of each month the system serves water to the public. Information that shall be reported includes: the total number of measurements taken during the month; the maximum daily measurement; the number and percentage of measurements taken during the month that are less than or equal to the turbidity limits specified in section 19-13-B102(j)(4) of the Regulations of Connecticut State Agencies, for the filtration technology being used; the date and value of any measurements taken during the month that exceed one (1) NTU. In addition, for any system using conventional filtration treatment or direct filtration and required to monitor the turbidity of each individual filter (or the turbidity of combined filter effluent for systems serving fewer than 10,000 persons and having two or fewer filters) under section 19-13-B102(e)(7)(S)(i) of the Regulations of Connecticut State Agencies:

(I) The system shall submit a report to the department, no later than nine (9) calendar days following the end of each month, indicating that the system has conducted individual filter monitoring or combined filter effluent (CFE) for systems serving fewer than 10,000 persons that have 2 or fewer filters as required under section 19-13-B102(e)(7)(S)(i) of the Regulations of Connecticut State Agencies;

(II) If any individual filter or combined filter effluent (CFE) for systems serving fewer than 10,000 persons that have 2 or fewer filters has a measured turbidity level of greater than 1.0 NTU in two (2) consecutive measurements taken fifteen (15) minutes apart, the system shall submit a report to the department, no later than nine (9) calendar days following the end of each month. The report shall indicate the filter number, the turbidity measurements and date(s) on which an exceedance occurred.

For systems serving 10,000 or more persons, the report shall also include either a filter profile, as defined in section 19-13-B102(a) of the Regulations of Connecticut State Agencies, which shall be produced no later than seven (7) days of an exceedance, or a reason for the exceedance.

For systems serving fewer than 10,000 persons, the report shall also include the cause of the exceedance(s), if known;

(III) For systems serving 10,000 or more persons, if any individual filter has a measured

turbidity level of greater than 0.5 NTU in two (2) consecutive measurements, taken fifteen (15) minutes apart at the end of the first four (4) hours of continuous filter operation, after the filter has been backwashed or otherwise taken off line, the system shall submit a report to the department, no later than nine (9) calendar days following the end of each month. The report shall indicate the filter number, the turbidity measurements, date(s) on which an exceedance occurred, and provide either a filter profile, as defined in subsection (a) of this section, which shall be produced no later than seven (7) days of an exceedance, or a reason for the exceedance;

(IV) If any individual filter or combined filter effluent (CFE) for systems serving fewer than 10,000 persons that have 2 or fewer filters has a measured turbidity level of greater than 1.0 NTU in two (2) consecutive measurements, taken fifteen (15) minutes apart at any time in each of three (3) consecutive months, the system shall submit a report to the department, no later than nine (9) calendar days following the end of each month. The report shall indicate the filter number, the turbidity measurements, and date(s) on which an exceedance occurred. In addition, the system shall produce a self assessment of the filter (if monitoring CFE in lieu of monitoring each individual filter, the system shall produce a self-assessment of both filters), as defined in section 19-13-B102(a) of the Regulations of Connecticut State Agencies, within fourteen (14) days of the exceedance and provide it to the department within 9 days of the end of the month in which the exceedance occurred or within 14 days of the exceedance, whichever is sooner. Systems serving fewer than 10,000 persons shall not be required to complete a filter self-assessment if a comprehensive performance evaluation (CPE) is required under section (V) of this subclause; and

(V) If any individual filter or combined filter effluent (CFE) for systems serving fewer than 10,000 persons that have 2 or fewer filters has a measured turbidity level of greater than 2.0 NTU in two (2) consecutive measurements, taken fifteen (15) minutes apart at any time in each of two (2) consecutive months, the system shall submit a report to the department, no later than nine (9) calendar days following the end of each month. The report shall indicate the filter number, the turbidity measurements, dates on which an exceedance occurred, and that a comprehensive performance evaluation (CPE) is required. In addition the system shall arrange to have a comprehensive performance evaluation conducted by a third party, approved by the department, no later than thirty (30) days following an exceedance for systems serving 10,000 or more persons and no later than sixty (60) days following an exceedance for systems serving fewer than 10,000 persons and have the evaluation completed and submitted to the department no later than ninety (90) days following the exceedance for systems serving 10,000 or more persons and no later than one hundred-twenty (120) days following an exceedance for systems serving fewer than 10,000 persons.

(ii) Disinfection information specified in subsections (e)(7)(S)(ii) and (e)(7)(S)(iii) shall be reported to the department within nine (9) calendar days after the end of each month the system serves water to the public. Information that shall be reported includes: for each day, the lowest measurement of residual disinfectant concentration in mg/L in the water entering the distribution system, the dates 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 department was notified of the occurrence. The following information shall be submitted

on the samples taken in the distribution system in conjunction with total coliform monitoring pursuant to section 19-13-B102(e)(7) of the Regulations of Connecticut State Agencies: number of instances where the residual disinfectant concentration is measured, number of instances where the residual disinfection concentration is not measured but heterotrophic bacteria plate count (HPC) is measured, number of instances where the residual disinfectant concentration is measured but not detected and no HPC is measured, number of instances where no residual disinfectant concentration is detected and where HPC is greater than (500)/ml, number of instances where the residual disinfectant concentration is not measured and HPC is greater than (500)/ml and for the current and previous month the system serves water to the public the value of ''V'' in the formula specified in section 19-13-B102(j)(3)(B)(iii) of the Regulations of Connecticut State Agencies.

(iii) Each system, upon discovering that a waterborne disease outbreak potentially attributable to that system has occurred, shall report that occurrence to the department as soon as possible, but not later than the end of the next business day. If at any time the combined filtered water turbidity exceeds 1 NTU, the system shall inform the department as soon as possible, but not later than the end of the next business day. If at any time the residual falls below 0.2 mg/l in the water entering the distribution system, the system shall notify the department as soon as possible, but not later than the end of the next business day. The system also shall notify the department not later than the end of the next business day whether the residual was restored to at least 0.2 mg/l not later than 4 hours after the time of discovery of insufficient chlorine residual.

(iv) A system required to develop a disinfection profile pursuant to section 19-13-B102(e)(7)(S)(iv) or (v) of the Regulations of Connecticut State Agencies shall submit the disinfection profile to the department no later than nine (9) calendar days following the end of each month.

(v) A system required to develop a disinfection profile and which decides to make a significant change to its disinfection practice, as defined in 40 CFR 141.172(c)(1), and in 40 CFR 141.541, as amended January 14, 2002, shall submit to the department the following: 1) a description of the proposed disinfection practice change; 2) a disinfection benchmark in accordance with paragraphs (2) to (3) inclusive, of 40 CFR 141.172(c), 40 CFR 141.543, as amended January 14, 2002 and 141.544, as amended January 14, 2002; 3) disinfection profiling data used to determine the disinfection benchmark as monitored pursuant to sections 19-13-B102(e)(7)(S)(iv) or 19-13-B102(e)(7)(S)(v) of the Regulations of Connecticut State Agencies, and; 4) an analysis of how the proposed change will affect current levels of disinfection. Prior to implementing the proposed disinfection practice change, the system shall consult with and obtain approval from the department.

(7) Reporting requirements for disinfectants and disinfection byproducts.

(A) Disinfectant residual, disinfection byproduct, and disinfection byproduct precursor information collected under subsection (e)(11)(A) of this section shall be reported to the department not later than 9 calendar days after the end of each monitoring period in which samples were collected.

(i) Disinfectants.

(I) A system monitoring for chlorine or chloramines as required by subsection (e)(11)(A)(iii)(III)(1)(A) of this section shall report:

(1) The number of samples taken during each month of the last quarter;

(2) The monthly arithmetic average of all samples taken in each month for the last 12 months;

(3) The arithmetic average of all monthly averages for the last 12 months; and

(4) Whether, based on subsection (e)(11)(A)(iv) of this section, the MRDL was violated.

(II) A system monitoring for chlorine dioxide as required by subsections (e)(11)(A)(iii)(III)(1)(A) and (e)(11)(A)(iii)(III)(2)(A) of this section shall report:

(1) The dates, results, and locations of samples taken during the last quarter;

(2) Whether, based on subsection (e)(11)(A)(iv) of this section, the MRDL was violated;

(3) Whether the MRDL was violated in any 2 consecutive daily samples; and

(4) Whether the resulting violation was a tier 1 or tier 2 notice.

(ii) Disinfection byproducts. A system monitoring for disinfection byproducts as required by subsection (e)(11)(A)(iii)(II) of this section shall report the following information to the department:

(I) A system monitoring for TTHM and HAA5 on a quarterly or more frequent basis shall report:

(1) The number of samples taken during the last quarter;

(2) The location, date, and result of each sample taken in the last quarter;

(3) The arithmetic average of all samples taken in the last quarter;

(4) The annual arithmetic average of the quarterly arithmetic averages for the last 4 quarters; and

(5) Whether, based on subsection (e)(11)(A)(iv) of this section, the MCL was violated.

(II) A system monitoring for TTHM and HAA5 less frequently than quarterly (but at least annually) shall report:

(1) The number of samples taken during the last monitoring period;

(2) The location, date, and result of each sample taken during the last monitoring period;

(3) The arithmetic average of all samples taken over the last year; and

(4) Whether, based on subsection (e)(11)(A)(iv) of this section, the MCL was violated.

(III) A system monitoring for TTHM and HAA5 less frequently than annually shall report the location, date, and result of each sample taken as well as whether, based on subsection (e)(11)(A)(iv) of this section, the MCL was violated.

(IV) A system monitoring for chlorite shall report:

(1) The number of entry point samples taken each month for the last 3 months;

(2) The location, date, and result of each sample (both entry point and distribution system) taken during the last quarter;

(3) For each month in the reporting period, the arithmetic average of all samples taken in each 3 sample set taken in the distribution system; and

(4) Whether, based on subsection (e)(11)(A)(iv) of this section , the MCL was violated, in which month it was violated, and how many times it was violated each month.

(V) A system monitoring for bromate shall report:

(1) The number of samples taken during the last quarter;

(2) The location, date, and result of each sample taken during the last quarter;

(3) The arithmetic average of the monthly arithmetic averages of all samples taken in the last year; and

(4) Whether, based on subsection (e)(11)(A)(iv) of this section, the MCL was violated.

(iii) Disinfection byproduct precursors and enhanced coagulation or enhanced softening.

(I) Systems monitoring monthly or quarterly for TOC under the requirements of subsection (e)(11)(A)(iii)(IV) of this section and required to meet the enhanced coagulation or enhanced softening requirements in subsection (j)(11)(B)(i) or (ii) of this section shall report the following to the department:

(1) The number of paired samples taken during the last quarter;

(2) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter;

(3) 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;

(4) Calculations for determining compliance with the TOC percent removal requirements, as provided in subsection (j)(11)(C) of this section; and

(5) Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in subsection (j)(11)(B) of this section for the last 4 quarters.

(II) Systems monitoring monthly or quarterly for TOC under the requirements of subsection (e)(11)(A)(iii)(IV) of this section and meeting 1 or more of the alternative compliance criteria in subsection (j)(11)(A) of this section shall report the following to the department:

(1) The alternative compliance criterion that the system is using;

(2) The number of paired samples taken during the last quarter;

(3) The location, date, and result of each paired sample and associated alkalinity taken during the last quarter;

(4) The running annual average based on monthly averages, or quarterly samples, of source water TOC for systems meeting a criterion in subsections (j)(11)(A)(i) or (ii) of this section or of treated water TOC for systems meeting the criterion in subsection (j)(11)(A)(i) of this section;

(5) The running annual average based on monthly samples, or quarterly samples, of source or finished water SUVA for systems meeting the criterion in subsection (j)(11)(A)(iv) of this section;

(6) The running annual average of source water alkalinity for systems meeting the criterion in subsection (j)(11)(A)(ii) of this section and of treated water alkalinity for systems meeting the criterion in subsection (j)(A)(v) of this section;

(7) The running annual average for both TTHM and HAA5 for systems meeting the criterion in subsection (j)(11)(A)(iii) of this section;

(8) The running annual average of the amount of magnesium hardness removal (as CaCO, in mg/l) for systems meeting the criterion in subsection (j)(11)(A)(vi) of this section; and

(9) Whether the system is in compliance with the particular alternative compliance criterion in subsection (j)(11)(A) of this section.

(B) Stage 2 disinfection byproducts requirement.

(i) A system shall report the following information collected under subsection (e)(11)(C)

of this section for each monitoring location to the department not later than 9 calendar days after 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 4 quarters for each monitoring location, 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 4 quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the system shall report this information to the department as part of the first report due following the compliance date or anytime thereafter that this determination is made. If the system is required to conduct monitoring at a frequency that is less than quarterly, the system shall make compliance calculations beginning with the first compliance sample taken after the compliance date, unless the system is required to conduct increased monitoring under subsection (e)(11)(C)(vi) of this section;

(IV) Whether, based on subsections (e)(11)(B)(i) and (e)(11)(C) of this section, the MCL was violated at any monitoring location; and

(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.

(ii) If a Subpart H system is seeking to qualify for or remain on reduced TTHM/HAA5 monitoring, the Subpart H system shall report the following source water TOC information for each treatment plant that treats surface water or GWUDI to the department not later than 9 calendar days after the end of any quarter in which monitoring is required:

(I) The number of source water TOC samples taken each month during the last quarter;

(II) The date and result of each sample taken during the last quarter;

(III) The quarterly average of monthly samples taken during the last quarter or the result of the quarterly sample;

(IV) The running annual average of quarterly averages from the past 4 quarters; and

(V) Whether the running annual average exceeded 4.0 mg/l.

(iii) The department 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.

(8) Reporting and recordkeeping requirements — filter backwash recycling

(A) A system shall notify the department in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification shall include the following:

(i) 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; and

(ii) Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experienced in the previous year in gpm, design flow for the treatment plant in gpm, and the approved operating capacity for the plant where the department has made such determinations.

(B) A system shall collect and retain on file for review and evaluation by the department

beginning June 8, 2004, the following recycle flow information:

(i) A copy of the recycle notification and information submitted to the department pursuant to subparagraph (A) of this subdivision;

(ii) A list of all recycle flows and the frequency with which they are returned;

(iii) Average and maximum backwash flow rates through the filters and the average and maximum duration of the filter backwash process in minutes;

(iv) Typical filter run length and a written summary of how filter run length is determined;

(v) The type of treatment provided for the recycle flow; and

(vi) Data on the physical dimensions of the equalization and treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable.

(9) Reporting requirements for enhanced treatment for Cryptosporidium.

(A) Reporting source water monitoring results.

(i) Systems shall report results from the source water monitoring required under subsection (e)(7)(T)(ii) of this section not later than 10 days after the end of the first month following the month when the sample is collected.

(ii) All systems shall report results from the second round of source water monitoring required under subsection (e)(7)(T)(ii)(I) of this section to the department.

(iii) At a minimum, systems shall report the applicable information in subclauses (I) and (II) of this clause for the source water monitoring required under subsection (e)(7)(T)(ii) of this section:

(I) (1) Systems shall report the following data elements for each Cryptosporidium analysis:

(A) System ID;

(B) Facility ID;

(C) Sample collection date;

(D) Sample type (field or matrix spike);

(E) Sample volume filtered (L), to nearest 1/4 L;

(F) Whether 100 percent of filtered volume was examined; and

(G) Number of oocysts counted.

(2) For matrix spike samples, systems shall also report the sample volume spiked and estimated number of oocysts spiked. These data are not required for field samples.

(3) For samples in which less than 10 L is filtered or less than 100 percent of the sample volume is examined, systems shall also report the number of filters used and the packed pellet volume.

(4) For samples in which less than 100 percent of sample volume is examined, systems shall also report the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(II) Systems shall report the following data elements for each E. coli analysis:

(1) System ID;

(2) Facility ID;

(3) Sample collection date;

(4) Analytical method number;

(5) Method type;

(6) Source type (flowing stream, lake, reservoir, GWUDI);

(7) E. coli/100 ml; and

(8) Turbidity, except systems serving fewer than 10,000 people that are not required to monitor for turbidity under subsection (e)(7)(T)(ii) of this section, are not required to report turbidity with the system's E. coli results.

(iv) A system may submit an application to the department requesting not to report source water monitoring results under clauses (i) through (iii), inclusive, of this subparagraph if the system meets the criteria in subsection (e)(7)(T)(ii)(III) of this section. Such application shall be submitted in accordance with subsection (t) of this section and shall include documentation demonstrating that the system meets the criteria in subsection (e)(7)(T)(ii)(III) of this section.

(B) Reporting sampling schedules.

(i) Systems shall report to the department sampling schedules as required by subsection (e)(7)(T)(iii) of this section.

(ii) A system may submit an application to the department requesting approval to not report sampling schedules under subsection (e)(7)(T)(iii) of this section if the system meets the criteria in subsection (e)(7)(T)(ii)(III) of this section. Such application shall be submitted in accordance with subsection (t) of this section and shall include documentation demonstrating that the system meets the criteria in subsection (e)(7)(T)(ii)(III) of this section.

(C) Reporting bin classifications. Systems shall report to the department the system's Cryptosporidium bin classifications as described in subsection (j)(12)(A) of this section.

(D) Systems shall report to the department disinfection profiles and benchmarks as described in subsections (e)(7)(T)(vii) through (viii) of this section prior to making a significant change in disinfection practice.

(E) Systems shall report to the department in accordance with Table 9-H1 of this subparagraph for any microbial toolbox options used to comply with treatment requirements under subsection (j)(12)(B) of this section:

TABLE 9-H1. MICROBIAL TOOLBOX REPORTING REQUIREMENTS

TOOLBOX OPTION	***SYSTEMS SHALL SUBMIT THE FOLLOWING INFORMATION***	**ON THE FOLLOWING SCHEDULE**

(i) Watershed Control Program.	(I) Notice of intention to develop a new or continue an existing watershed control program.	Not later than 2 years before the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(II) Watershed control plan.	Not later than 1 year before the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(III) Annual watershed control program status report.	Every 12 months, beginning 1 year after the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(IV) Watershed sanitary survey report.	For CWSs, every 3 years beginning 3 years after the applicable treatment compliance date in subsection (j)(12)(C) of this section. For noncommunity water systems, every 5 years beginning 5 years after the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(ii) Alternative source/ intake management.	Verification that the system has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results.	Not later than the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(iii) Presedimentation.	Monthly verification of the following: (I) Continuous basin operation; (II) Treatment of 100 percent of the flow; (III) Continuous addition of a coagulant; and (IV) At least 0.5 log mean reduction of influent turbidity or compliance with alternative department-approved performance criteria.	Monthly reporting not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(iv) Two-stage lime	Monthly verification of the follow	Monthly reporting not later

softening.	ing: (I) Chemical addition and hardness precipitation occurred in 2 separate and sequential stages prior to filtration; and (II) Both stages treated 100 percent of the plant flow.	than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(v) Bank filtration.	(I) Initial demonstration of the following: (A) Unconsolidated, predominantly sandy aquifer; and (B) Setback distance of at least 25 feet (0.5 log credit) or 50 feet (1.0 log credit).	Not later than the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(II) If monthly average of daily max turbidity is greater than 1 nephelolometric turbidity unit (NTU), then the system shall report result and submit an assessment of the cause.	Report not later than 30 calendar days after the month in which monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(vi) Combined filter performance.	Monthly verification of combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the 4 hour CFE measurements taken each month.	Monthly reporting not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(vii) Individual filter performance.	Monthly verification of the following: (I) Individual filter effluent turbidity levels less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter; and (II) No individual filter greater than 0.3 NTU in 2 consecutive readings 15 minutes apart.	Monthly reporting not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.

(viii) Bag filters and cartridge filters.	(I) Demonstration that the following criteria are met: (A) Process meets the definition of bag or cartridge filtration; and (B) Removal efficiency established through challenge testing that meets criteria in this subdivision and subsections (e)(7)(T), (j)(12) and (j)(13) of this section.	Not later than the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(II) Monthly verification that 100 percent of plant flow was filtered.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(ix) Membrane filtration.	(I) Results of verification testing demonstrating the following: (A) Removal efficiency established through challenge testing that meets criteria in this subdivision and subsections (e)(7)(T), (j)(12) and (j)(13) of this section; and (B) Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline.	Not later than the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(II) Monthly report summarizing the following: (A) All direct integrity tests above the control limit; and (B) If applicable, any turbidity or alternative department-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(x) Second stage filtration.	Monthly verification that 100 percent of flow was filtered through both stages and that the first stage was preceded by a coagulation step.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.

(xi) Slow sand filtration (as secondary filter).	Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100 percent of flow from surface water or GWUDI sources, or both.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(xii) Chlorine dioxide.	Summary of CT values for each day as described in subsection (j)(13)(F) of this section.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(xiii) Ozone.	Summary of CT values for each day as described in subsection (j)(13)(F) of this section.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.
(xiv) UV.	(I) Validation of test results demonstrating operating conditions that achieve required UV dose.	Not later than the applicable treatment compliance date in subsection (j)(12)(C) of this section.
	(II) Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in subsection (j)(13)(F)(iii) of this section.	Not later than 9 calendar days after the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in subsection (j)(12)(C) of this section.

Reporting for ground water systems. In addition to the requirements of subdivisions (1) through (4), inclusive, of this subsection, a ground water system regulated under subsections (e)(7)(E), (e)(12) and (j)(14) of this section shall provide the following information to the department:

(A) A ground water system conducting compliance monitoring under subsection (j)(14)(B) of this section shall notify the department any time the ground water system fails to meet any of the requirements under subsection (j)(14)(B)(iii) of this section, including, but not limited to the ground water system's required minimum RDC, the ground water system's required minimum CT value, if the department stated a required minimum CT value in the department's approval issued pursuant to subsection (j)(14)(B)(i)(I) or

(j)(14)(B)(ii)(I) of this section, the ground water system's department-approved membrane operating criteria or membrane integrity, and the ground water system's department-approved alternative treatment operating criteria, if operation in accordance with the department-approved criteria or requirements is not restored within 4 hours. The ground water system shall notify the department immediately, but not later than the end of the next business day, by telephone.

(B) After completing any corrective action under subsections (e)(7)(E)(iv) or (j)(14)(A) of this section, a ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting approval of the ground water system's completion of corrective action or actions. Such application shall include documentation demonstrating completion of such corrective action or actions. Documentation demonstrating completion of corrective action may include, but need not be limited to, digital photographs and engineering reports. Such application shall be submitted to the department not later than 30 calendar days after completion of the corrective action or actions.

(C) If a ground water system subject to the requirements of subsection (e)(12)(C) of this section does not conduct source water monitoring under subsection (e)(12)(C)(v)(II) of this section, the ground water system shall submit an application to the department in accordance with subsection (t) of this section requesting approval that the ground water system's total coliform positive sample was collected at a location in the distribution system that, at the time of collection, had a condition that caused the total coliform-positive sample. Such application shall include documentation demonstrating that the condition in the distribution system caused the total coliform-positive sample. Evidence that a condition in the distribution system caused the total coliform-positive sample includes, but is not limited to, documentation of a bio-film problem. Such application shall be submitted to the department not later than 30 calendar days after the department's approval of the application submitted under subsection (e)(12)(C)(v)(II) of this section.

(i) **Public notification and consumer confidence report requirements.**

(1) Tier 1 notice form, manner and frequency of notice. For a tier 1 notice, a system shall comply with the following requirements:

(A) Provide a public notice to the system's consumers as soon as practical but not later than 24 hours after the system learns of the violation in 1 or more of the following forms of delivery:

(i) Appropriate broadcast media, such as radio and television;

(ii) Posting of the notice in a conspicuous location(s) throughout the area served by the system;

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

(iv) Another delivery method approved in writing by the department. To request approval to use another delivery method, the system shall submit an application to the department in accordance with subsection (t) of this section not later than 12 hours after the system learns of the violation.

(B) Initiate consultation with the department as soon as practical but not later than 24 hours after the system learns of the violation or situation, to determine additional public notice requirements.

(C) Comply with any additional public notification requirements that are established as a result of the consultation with the department. 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.

(2) Tier 2 notice form, manner and frequency of notice. For a tier 2 notice, a system shall comply with the following requirements:

(A) Provide a public notice to the system's consumers as soon as practical but not later than 30 days after the system learns of the violation in 1 or more of the following forms of delivery:

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

(ii) Publication in a local newspaper or newsletter;

(iii) Posting the notice in conspicuous locations throughout the distribution system and frequented by persons served by the system; or

(iv) Any other delivery method approved in writing by the department. To request approval to use another delivery method, the system shall submit an application to the department in accordance with subsection (t) of this section not later than 15 calendar days after the system learns of the violation.

(B) After the initial notice, the system shall repeat the notice every 3 months for as long as the violation or situation persists.

(C) If the public notice is posted, the notice shall remain in place for as long as the violation or situation persists, but in no case for less than 7 calendar days, even if the violation or situation is resolved.

(3) Tier 3 notice form, manner and frequency of notice. For a tier 3 notice, a system shall comply with the following requirements:

(A) Provide a public notice to the system's consumers not later than 1 year after the system learns of the violation or situation or begins operating under a variance or exemption in 1 or more of the following forms of delivery:

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

(ii) Publication in a local newspaper or newsletter; or

(iii) Posting the notice in conspicuous locations throughout the distribution system and frequented by persons served by the system; or

(iv) Any other delivery method approved in writing by the department. To request approval to use another delivery method, the system shall submit an application to the department in accordance with subsection (t) of this section not later than 90 calendar days after the system learns of the violation.

(B) After the initial notice, the notice shall be repeated annually for as long as the violation, variance, exemption or other situation persists. If the notice is posted, the notice shall remain in place for as long as the violation, variance, exemption or other situation persists, but in no case less than 7 calendar days even if the violation or situation is resolved.

(C) The consumer confidence report (CCR) required under subdivision (10) of this subsection may be used as a vehicle for the initial public notice of a tier 3 notice and all required repeat notices, provided:

(i) The CCR is provided to persons served not later than 12 months after the system learns of the violation or situation, as required under subparagraph (A) of this subdivision;

(ii) The tier 3 notice contained in the CCR follows the content requirements under subdivision (4) of this subsection; and

(iii) The CCR is distributed following the delivery requirements under subparagraphs (A)(i) through (iv), inclusive, of this subdivision.

(4) General content of public notice for a tier 1, tier 2 or tier 3 notice. Each notice required by this section shall be approved by the department.

(A) Each public notice for a tier 1, tier 2 or tier 3 notice shall contain the following information:

(i) A description of the violation or situation, including the contaminant(s) of concern and, when applicable, the contaminant level(s);

(ii) Any potential adverse health effects from the violation or situation, including, but not limited to any applicable standard language required by 40 CFR 141.205, as amended from time to time, 40 CFR 141, Subpart O, Appendix A, as amended from time to time, 40 CFR 141, Subpart Q, Appendix B, as amended from time to time, and 40 CFR 141, Subpart Q, Appendix C, as amended from time to time;

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

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

(v) Whether alternative water supplies should be used;

(vi) What actions the consumer should take, including when the consumer should seek medical help, if known;

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

(viii) When the violation or situation occurred;

(ix) When the system expects to return to compliance or resolve the situation; and

(x) A statement to encourage the recipient of the notice to distribute the public notice to other persons served, using 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."

(B) Each notice for systems operating under a variance, administrative order or an exemption shall contain the following information:

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

(ii) The date on which the variance, order 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, order or exemption; and

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

(C) Each public notice required by this section:

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

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

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

(iv) Shall not contain language that nullifies the purpose of the notice.

(D) For systems serving a large proportion of non-English speaking consumers, as determined in writing by the department, the notice shall also contain information in the appropriate foreign language regarding the importance of the notice or a telephone number or address where persons served may contact the system to obtain a translated copy of the notice or to request assistance in the appropriate foreign language.

(5) General notice requirements for other than tier 1, tier 2 or tier 3 notice.

(A) A CWS or NTNC that exceeds the copper action level, based on tap water samples collected in accordance with subsection (e)(8) of this section, shall notify consumers of the concentration by direct mail, not later than 30 calendar days after the CWS or NTNC learns of the exceedance. The form and manner of the public notice shall follow the requirements for a tier 2 notice as prescribed in subdivision (2) of this subsection. At a minimum, the notice shall include the following mandatory language: "If you have been diagnosed with copper intolerance due to a genetic deficiency, please inform your physician that the 90th percentile level of copper in our water is (BLANK) milligrams per liter." (The blank space should contain the 90th percentile level of copper in the water).

(B) When the sodium concentration in finished water exceeds 28.0 mg/l, the system shall notify the system's consumers of the concentration by direct mail or in the next billing cycle, and shall repeat such notification annually for as long as the exceedance exists. At a minimum, the notice shall include the following mandatory language: "If you have been placed on a sodium-restricted diet, please inform your physician that our water contains (BLANK) mg/l of sodium." (The blank space should contain the level of sodium in the water.)

(C) Special notice of the availability of unregulated contaminant monitoring results. A system that is required to monitor for the unregulated contaminants, pursuant to 40 CFR 141.40, as amended from time to time, shall notify persons served by the system of the availability of the results of such sampling not later than 12 months after the monitoring results are known. The form and manner of the public notice shall follow the requirements for a tier 3 notice prescribed in subdivision (3) of this subsection. The notice shall also identify a person and provide a telephone number for information on the monitoring results.

(D) Special notice of exceedance of the SMCL for fluoride. A system that exceeds the fluoride SMCL of 2.0 mg/l, but does not exceed the SMCL of 4.1 mg/l for fluoride, shall provide public notice to persons served as soon as practical, but not later than 12 months from the day the system learns of the fluoride level. The notice shall be repeated annually for as long as the fluoride level remains between 2.0 mg/l and 4.1 mg/l. If the notice is posted, it shall remain in place for as long as the fluoride level remains between 2.0 mg/l and 4.1 mg/l, but in no case for less than 7 calendar days. The notice shall follow the requirements for a tier 3 notice as specified in subdivision (3) of this subsection and shall contain at a minimum the language required in 40 CFR 141.208(c), as amended from time to time.

(E) Special notice for repeated failure to conduct monitoring of the source water for Cryptosporidium and for failure to determine bin classification.

(i) A CWS or non-community water system that is required to monitor source water under subsection (e)(7)(T)(ii) of this section shall notify persons served by the CWS or non-community water system that monitoring has not been completed as specified not later than 30 calendar days after the CWS or non-community water system has failed to collect any 3 months of monitoring as specified in subsection (e)(7)(T)(ii)(II) of this section. The notice shall be repeated as specified in subdivision (2)(B) of this subsection.

(ii) A CWS or non-community water system that is required to determine a bin classification under subsection (j)(12)(A) of this section shall notify persons served by the CWS or non-community water system that the determination has not been made as required not later than 30 calendar days after the CWS or non-community water system has failed to report the determination as specified in subsection (j)(12)(A)(v) of this section. The notice shall be repeated as specified in subdivision (2)(B) of this subsection. The notice is not required if the CWS or non-community water system is complying with a department-approved schedule to address the violation.

(iii) The form and manner of the special notice shall follow the requirements of a tier 2 public notice prescribed in subdivision (2) of this subsection. The special notice shall be presented as required in subdivision (4)(C) of this subsection.

(iv) The special notice shall contain the following language in subclauses (I) through (III), inclusive, of this clause, including the language necessary to fill in the information in brackets:

(I) The special notice for repeated failure to conduct monitoring shall 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 required deadline of {date}.

For more information, please call {name of water system contact} of {name of water system} at {phone number}.

(II) The special notice for failure to determine bin classification shall 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}.

(III) Each special notice shall also include a description of what the CWS or non-

community water system is doing to correct the violation and when the CWS or non-community water system expects to return to compliance or resolve the situation.

(F) Special notice to the public of significant deficiencies or source water fecal contamination.

(i) In addition to the applicable public notification requirements of this subsection, a CWS that receives a sanitary survey report or other written notification from the department containing the CWS's significant deficiency or significant deficiencies, or notification of a fecal indicator-positive ground water source sample that is not invalidated by the department under subsection (e)(12)(F) of this section shall inform persons served by the CWS under subdivision (10)(A) of this subsection of any significant deficiency or fecal indicator-positive source sample that has not been corrected. The CWS shall continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the ground water source is determined by the department to be corrected under subsections (e)(7)(E)(iv)(IV) or (j)(14)(A)(iv) of this section.

(ii) In addition to the applicable public notification requirements of this subsection, a non-community water system that receives a sanitary survey report or other written notification from the department containing the non-community water system's significant deficiency or significant deficiencies shall inform persons served by the non-community water system in a manner approved by the department of any significant deficiency that has not been corrected not later than 12 months after receiving the sanitary survey report or other written notification from the department containing the non-community water system's significant deficiencies, or earlier if directed by the department. To request such approval, the non-community water system shall submit an application to the department in accordance with subsection (t) of this section requesting approval of the manner in which the non-community water system will inform the public served by the non-community water system. The non-community water system shall continue to inform the public annually until the significant deficiency is corrected. The information submitted to the public shall include the following information:

(I) The nature of the significant deficiency and the date the significant deficiency was identified by the department;

(II) The department-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and

(III) For non-community water systems with a large proportion of non-English speaking consumers, as determined by the department, information in the appropriate language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the non-community water system to obtain a translated copy of the notice or assistance in the appropriate language.

(iii) If directed by the department, a non-community water system with significant deficiencies that have been corrected shall inform persons served by the non-community water system of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under clause (ii) of this subparagraph.

(6) Lead and copper public education and notification requirements. All CWSs and NTNCs shall deliver a consumer notice of lead tap water monitoring results to persons

served by the CWS or NTNC at sites that are tested, as specified in subparagraph (C) of this subdivision. A CWS or NTNC that exceeds the lead action level based on tap water samples collected in accordance with subsection (e)(8) of this section shall deliver the public education materials contained in subparagraph (A) of this subdivision in accordance with the requirements in subparagraph (B) of this subdivision. CWSs and NTNCs that exceed the lead action level shall offer to sample the tap water of any consumer who requests it. The CWS or NTNC is not required to pay for collecting or analyzing the sample, nor is the CWS or NTNC required to collect and analyze the sample itself. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) Content of written public education materials.

(i) Content requirements for CWSs and NTNCs. CWSs and NTNCs shall include in the CWS's or NTNC's public education materials the elements listed in subclauses (I) through (VI) of this clause in printed materials (e.g., brochures and pamphlets) in the same order as listed. In addition, language in subclauses (I) through (II) and (VI) of this clause shall be included in the materials, exactly as written, except for the text in brackets for which the CWS or NTNC shall include CWS or NTNC-specific information. Any additional information presented by a CWS or NTNC shall be consistent with the information in subclauses (I) through (VI), inclusive, of this clause and shall be in plain language that can be understood by the general public. CWSs and NTNCs shall submit an application to the department requesting approval of all written public education materials. Such application shall be submitted to the department for approval prior to delivery and in accordance with subsection (t) of this section.

(I) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. {INSERT NAME OF WATER SYSTEM} found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.

(II) Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother's bones, which may affect brain development.

(III) Provide information regarding sources of lead:

(1) Explain what lead is;

(2) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead; and

(3) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(IV) Discuss the steps the consumer can take to reduce their exposure to lead in drinking

water:

(1) Encourage running the water to flush out the lead;

(2) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula;

(3) Explain that boiling water does not reduce lead levels;

(4) Discuss other options consumers can take to reduce lead in drinking water, such as alternative sources or treatment of water; and

(5) Suggest that parents have their child's blood tested for lead.

(V) Explain why there are elevated levels of lead in the CWS's or NTNC's drinking water (if known) and what the CWS or NTNC is doing to reduce the lead levels in homes/buildings in this area.

(VI) For more information, call us at {INSERT YOUR NUMBER} {(IF APPLICABLE), or visit our web site at {INSERT YOUR WEB SITE HERE}}. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's web site at http://www.epa.gov/lead or contact your health care provider.

(ii) Additional content requirements for CWSs. In addition to including the elements specified in clause (i) of this subparagraph, a CWS shall also include the following elements in the CWS's written public education materials:

(I) Tell consumers how to get their water tested; and

(II) Discuss lead in plumbing components and the difference between low lead and lead free.

(B) Delivery of public education materials.

(i) For CWSs and NTNCs serving a large proportion of non-English speaking consumers, as determined by the department, the public education materials shall 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 CWS or NTNC to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(ii) A CWS that exceeds the lead action level on the basis of tap water samples collected in accordance with subsection (e)(8) of this section, and that is not already conducting public education tasks under this subdivision, shall implement the public education tasks under this subdivision, including the public education delivery tasks listed in this clause, not later than 60 days after the end of the monitoring period in which the exceedance occurred. If a CWS requires an extension beyond the 60-day implementation deadline in which to implement the public education tasks in this clause, the CWS shall obtain approval of such extension from the department in writing prior to the last day of the 60-day implementation deadline. The CWS shall submit to the department at least 30 calendar days prior to the last day of the 60-day implementation period an application requesting an extension beyond the 60-day implementation deadline. Such application shall include the reason or reasons that the CWS is unable to comply with the 60-day implementation deadline and shall be submitted in accordance with subsection (t) of this section. The department may approve the application for an extension beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis. If the department approves the CWS's extension request, such approval shall be in writing. A CWS shall conduct the following

public education tasks:

(I) Deliver printed materials meeting the content requirements of subparagraph (A) of this subdivision to all bill-paying consumers.

(II) (1) Contact consumers who are most at risk by delivering education materials that meet the content requirements of subparagraph (A) of this subdivision to local public health agencies even if they are not located within the CWS's service area, along with an informational notice that encourages distribution to all the organization's potentially affected consumers or CWS's users. The CWS shall contact the local public health agencies directly by phone or in person. If the local public health agencies provide to a CWS a specific list of additional community-based organizations serving target populations, which may include organizations outside the service area of the CWS, the CWS shall deliver education materials that meet the content requirements of subparagraph (A) of this subdivision to all organizations on the provided list.

(2)Contact consumers who are most at risk by delivering materials that meet the content requirements of subparagraph (A) of this subdivision to the following organizations listed in subclauses (II)(2)(A) through (F), inclusive, of this clause that are located within the CWS's service area, along with an informational notice that encourages distribution to all the organization's potentially affected consumers or CWS users:

(A) Public and private schools or school boards;

(B) Women, Infants and Children and Head Start programs;

(C) Public and private hospitals and medical clinics;

(D) Pediatricians;

(E) Family planning clinics; and

(F) Local welfare agencies.

(3) Locate the following organizations listed in subclauses (II)(3)(A) through (C), inclusive, of this clause within the service area and deliver materials that meet the content requirements of subparagraph (A) of this subdivision to them, along with an informational notice that encourages distribution to all potentially affected consumers or users. Contacting at-risk consumers may include requesting a specific contact list of the organizations listed in subclauses (II)(3)(A) through (C), inclusive, of this clause from the local public health agencies, even if the agencies are not located within the CWS's service area:

(A) Childcare centers, group day care homes, and family day care homes licensed by the department under Chapter 368a of the Connecticut General Statutes;

(B) Public and private preschools; and

(C) Obstetricians-gynecologists and midwives.

(III) No less often than quarterly, provide information on or in each water bill as long as the CWS exceeds the action level for lead. The message on the water bill shall include the following statement exactly as written except for the text in brackets for which the CWS shall include CWS-specific information: {INSERT NAME OF CWS} found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information please call {INSERT NAME OF CWS} {or visit (INSERT THE CWS'S WEB SITE HERE)}. If the CWS is unable to include this information in the CWS's water bills, the CWS shall submit an application to the department in accordance with subsection (t) of this section requesting approval to mail this public education information to the CWS's

consumers in a separate mailing. The CWS shall obtain approval of such separate mailing before mailing such information in the separate mailing.

(IV) Post material meeting the content requirements of subparagraph (A) of this subdivision on the CWS's web site if the CWS serves a population greater than 100,000.

(V) Submit a press release to newspaper, television and radio stations.

(VI) In addition to subclauses (I) through (V), inclusive, of this clause, CWSs shall implement at least 3 activities from 1 or more categories listed in subclauses (VI)(1) through (9), inclusive, of this clause. The CWS shall consult with the department regarding the educational content and selection of these activities and, after such consultation, shall submit an application to the department requesting approval of the education content and activities selected. Such application shall be submitted in accordance with subsection (t) of this section. The CWS shall obtain department approval of educational content and the activities selected before implementing such activities.

(1) Public Service Announcements;

(2) Paid advertisements;

(3) Public area informational displays;

(4) E-mails to consumers;

(5) Public meetings;

(6) Household deliveries;

(7) Targeted individual consumer contact;

(8) Direct material distribution to all multi-family homes and institutions; and

(9) Other methods approved by the department.

(VII) For CWSs that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs. If the department has approved the CWS's use of an alternate monitoring period pursuant to the provisions of subsection (e)(8) of this section, the end of the monitoring period is the last day of that approved alternative monitoring period.

(iii) Repeating public education tasks each year a CWS exceeds lead action level. As long as a CWS exceeds the lead action level, the CWS shall repeat the activities pursuant to clause (ii) of this subparagraph as described in subclauses (I) through (IV), inclusive, of this clause.

(I) A CWS shall repeat the tasks contained in clauses (ii)(I), (II) and (VI), inclusive, of this clause every 12 months.

(II) A CWS shall repeat the tasks contained in clause (ii)(III) of this subparagraph with each billing cycle.

(III) A CWS serving a population greater than 100,000 shall post and retain material on a publicly accessible web site pursuant to clause (ii)(IV) of this subparagraph.

(IV) A CWS shall repeat the task in clause (ii)(V) of this subparagraph once every 6 months on a schedule approved in writing by the department. To request approval of the CWS's schedule, the CWS shall submit an application to the department in accordance with subsection (t) of this section at least 30 calendar days prior to the last day of the 60 day implementation period. If the department approves such extension, the department shall do so in writing in advance of the 60-day deadline.

(iv) Not later than 60 days after the end of the monitoring period in which the exceedance

occurred, unless the NTNC is already repeating public education tasks pursuant to clause (v) of this subparagraph, a NTNC shall deliver the public education materials specified by subparagraph (A) of this subsection in accordance with subclauses (I) and (II) of this clause. For NTNCs that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or, if the department has approved an alternative monitoring period pursuant to the provisions of subsection (e)(8) of this section, the end of the monitoring period is the last day of that established alternative monitoring period.

(I) The NTNC shall post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and

(II) The NTNC shall distribute informational pamphlets or brochures, or both, on lead in drinking water to each person served by the NTNC. A NTNC may use electronic transmission in lieu of or combined with printed materials if the use of electronic transmission achieves at least the same coverage as use of printed materials. A NTNC requesting approval to use electronic transmission in lieu of or combined with printed materials shall submit an application to the department in accordance with subsection (t) of this section requesting approval to use electronic transmission. The department may approve such use of electronic transmission only if such use achieves at least the same coverage as use of the printed materials.

(v) A NTNC shall repeat the tasks contained in clause (iv) of this subparagraph at least once during each calendar year in which the NTNC exceeds the lead action level. If a NTNC requires an extension beyond the 60-day implementation deadline in which to implement the public education tasks in clause (iv) of this subparagraph, the NTNC shall obtain approval of such extension from the department in writing prior to the last day of the 60-day implementation deadline. The NTNC shall submit to the department at least 30 calendar days prior to the last day of the 60-day implementation period an application requesting an extension beyond the 60-day implementation deadline. Such application shall include the reason or reasons that the NTNC is unable to comply with the 60-day implementation deadline and shall be submitted in accordance with subsection (t) of this section. The department may approve the application for an extension beyond the 60-day requirement for completion of the public education tasks in clause (iv) of this subparagraph if needed for implementation purposes on a case-by-case basis.

(vi) A CWS or NTNC may discontinue delivery of public education materials if it has met the lead action level during the most recent 6 month monitoring period conducted pursuant to the provisions of subsection (e)(8) of this section. Such a CWS or NTNC shall recommence public education in accordance with this subdivision if it subsequently exceeds the lead action level during any monitoring period.

(vii) A CWS may submit an application to the department requesting approval to use only the text specified in subparagraph (A)(i) of this subdivision in lieu of the text in subparagraph (A)(i) and (ii) of this subdivision and to perform the tasks listed in clauses (iv) and (v) of this subparagraph in lieu of the tasks listed in clauses (ii) and (iii) of this subparagraph. Such application shall include documentation demonstrating that the CWS satisfied the requirements in subclauses (I) and (II) of this clause, and shall be submitted in accordance with subsection (t) of this section. The department may approve such

application if the department determines that the CWS satisfies the following requirements:

(I) The CWS is a facility, such as a prison or a hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point of use treatment devices; and

(II) The CWS provides water as part of the cost of services provided and does not separately charge for water consumption.

(viii) A CWS serving 3,300 or fewer people may submit an application to the department in accordance with subsection (t) of this section requesting approval to limit certain aspects of its education programs as follows:

(I) With respect to the requirement in clause (ii)(VI) of this subparagraph that a CWS implement at least 3 of the activities listed in clauses (ii)(VI)(1) through (9), inclusive, of this subparagraph, a CWS serving 3,300 or fewer people shall implement at least 1 of the activities listed in clauses (ii)(VI)(1) through (9), inclusive, of this subparagraph.

(II) With respect to the requirements in clause (ii)(II) of this subparagraph, a CWS serving 3,300 or fewer people may limit the distribution of the public education materials required under clause (ii)(II) of this subparagraph to facilities and organizations such CWS serves that are most likely to be visited regularly by pregnant women and children.

(III) With respect to the requirement in clause (ii)(V) of this subparagraph, a CWS serving 3,300 or fewer persons that has distributed the required notices to every household such CWS serves, may request that the department waive the requirement in clause (ii)(V) of this subparagraph. The CWS serving 3,300 or fewer people shall provide with its application a written certification verifying that CWS serving 3,300 or fewer people distributed the required notices to every household such CWS serves. The department may approve such request if the department determines that the CWS serving 3,300 or fewer people has distributed the required notices to every household that such CWS serves.

(C) (C) Notification of Results.

(i) Reporting requirement. All CWSs and NTNCs shall provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of subsection (e)(8) of this section to the persons served by the CWS or NTNC at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

(ii) Timing of notification. A CWS or NTNC shall provide the consumer notice as soon as practical, but not later than 30 calendar days after the CWS or NTNC learns of the tap water monitoring results.

(iii) Content. The consumer notice shall include the results of lead tap water monitoring for the tap that was tested, an explanation of the health effects of lead, list steps consumers can take to reduce exposure to lead in drinking water and contact information for the CWS or NTNC. The notice shall also provide the MCLG and the action level for lead and the definitions for these terms from subsection (a) of this section.

(iv) Delivery. The consumer notice shall be provided by mail to persons served at the tap that was tested. If a CWS or NTNC wants to provide the consumer notice to persons served at the tap that was tested by a delivery method other than by mail, the CWS or NTNC shall submit to the department an application requesting approval to deliver the consumer notice by that method. Such application shall be submitted in accordance with subsection

(t) of this section. The department may approve such a method only if such method achieves at least the same coverage as delivery by mail. The CWS or NTNC shall provide the consumer notice to consumers at sample taps tested, including consumers who do not receive water bills.

(7) A public water system that sells or otherwise provides drinking water to a consecutive public water system is required to give public notice to the owner or operator of the consecutive public water system. The consecutive public water system is responsible for providing public notice to the persons it serves.

(8) A public water system, no later than ten (10) days after completing the public notification requirements of this section for the initial public notice and any repeat notices, shall submit to the department a certification that it has fully complied with the requirements of section 19-13-B102(i). The public water system shall include with this certification a representative copy of each type of notice distributed, published, posted, and made available to the persons served by the system and to the media.

(9) Notice to new consumers or billing units.

(A) A CWS shall give a copy of the most recent public notice for any continuing violation or for the existence of a variance, order, exemption, or other ongoing situation requiring a public notice, to all new billing units or new consumers, prior to or at the time service begins.

(B) A non-community water system shall continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation, variance, order exemption, or other situation requiring a public notice, for as long as the violation, variance, order, exemption, or other situation persists.

(10) Consumer confidence report requirements.

(A) A CWS shall annually prepare a consumer confidence report that contains data collected during the previous calendar year and includes the information specified in 40 CFR 141.153, as amended from time to time, 40 CFR 141.154, as amended from time to time, and 40 CFR 141, Subpart O, Appendix A, as amended from time to time. With respect to the inclusion of lead-specific information in a CWS's consumer confidence report, a CWS shall only utilize the lead-specific educational statement contained in 40 CFR 141.154(d)(1), as amended from time to time.

(B) Not later than July 1st of each year, a CWS serving 10,000 or more persons shall mail or directly deliver the consumer confidence report to its consumers. A good faith effort to reach the consumers who do not get water bills, using methods acceptable to the department, shall be made. If a CWS wants to provide the consumer confidence report to consumers who do not get water bills using a method other than mail or direct delivery, the CWS shall submit to the department an application requesting approval to deliver the consumer confidence report by that method. Such application shall be submitted in accordance with subsection (t) of this section. CWSs serving 100,000 persons or more shall post the consumer confidence report to a publicly accessible site on the Internet. A new CWS shall deliver the CWS's first report not later than July 1st of the year after the CWS's first full calendar year in operation and annually thereafter.

(C) A CWS that sells water to another CWS shall deliver the applicable information required in 40 CFR 141.153, as amended from time to time, to the buyer system not later

than April 1st of each year.

(D) A CWS serving more than 500 persons and fewer than 10,000 persons shall, not later than July 1st of each year, do the following:

(i) Publish the consumer confidence report in 1 or more local newspapers serving the area in which the CWS's consumers are located;

(ii) Inform the consumers, by mail or door-to-door delivery, that the consumer confidence report is available upon request; and

(iii) Make copies of the consumer confidence report available to the public upon request.

(E) A CWS serving 500 or fewer persons shall, not later than July 1st of each year, do the following:

(i) Inform the consumers, by mail, door-to-door delivery, or by posting in a location approved by the department that the consumer confidence report is available upon request; and

(ii) Make copies of the consumer confidence report available to the public upon request.

(F) Not later than July 1st of each year, a CWS shall mail 3 copies of the consumer confidence report to the department and 1 copy to the local director of health of each city, town, borough or district served by the CWS.

(G) Not later than August 9th of each year a CWS shall submit to the department a certification that the consumer confidence report has been distributed or, when applicable, made available to consumers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the department. The certification shall be on a form provided by the department.

(H) Each CWS shall make the CWS's consumer confidence reports available to the public upon request.

(I) For the purpose of this subdivision, the term "detected" means "detected" as defined in 40 CFR 141.151(d), as amended from time to time.

(J) Each CWS serving 1,000 or more persons or 250 consumers or more shall include in the CWS's consumer confidence report educational materials or information on:

(i) Water conservation;

(ii) Water supply source protection methods, including methods to reduce contamination; and

(iii) Health effects and sources of lead and copper.

(j) **Treatment techniques.**

(1) A MCLG of 0 is set for the following microbial pathogens: Giardia lamblia, Cryptosporidium, viruses and Legionella.

(2) General Requirements for surface water and GWUDI sources.

(A) Each system with a surface water or a GWUDI source shall install and properly operate water treatment processes that reliably achieve:

(i) At least 99.9 percent (3 log) removal or inactivation of Giardia lamblia cysts, or both, 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 consumer;

(ii) At least 99.99 percent (4 log) removal or inactivation of viruses, or both, 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 consumer; and

(iii) At least 99 percent (2 log) removal of Cryptosporidium between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first consumer.

(B) A system using a surface water or a GWUDI source is considered to be in compliance with the requirements of subparagraph (A) of this subdivision if the system meets the filtration requirements in subdivision (4) of this subsection and the disinfection requirements in subdivision (3)(B) of this subsection.

(C) Each system using a surface water or a GWUDI source shall be operated by certified operators pursuant to sections 25-32-7a through 25-32-14 of the Regulations of Connecticut State Agencies.

(D) A system shall install and have operational treatment consisting of disinfection and filtration in accordance with this subdivision not later than 18 months after the department's determination that treatment is required for a ground water source. Such determination shall be made if that ground water source is at risk of contamination from surface water. As an interim requirement until such treatment is operational, turbidity shall not exceed a monthly average of 1 nephelometric turbidity unit (NTU) or a 2 consecutive day average of 5 NTUs as monitored pursuant to subsection (e)(7)(H) of this section and the system supplied by this source shall be free of any waterborne disease outbreak.

(3) Disinfection.

(A) A system that uses a GWUDI source, and that does not provide and operate treatment pursuant to subdivision (2) of this subsection, shall provide interim disinfection pursuant to subsection (e)(7)(M) of this section.

(B) A Subpart H system that provides and operates treatment pursuant to subdivision (2) of this subsection, shall provide disinfection treatment as specified in clauses (i) through (iii), inclusive, of this subparagraph:

(i) The disinfection treatment shall be sufficient to ensure that the total treatment processes of that source achieve at least 99.9 percent (3 log) inactivation or removal of Giardia lamblia cysts, or both, and at least 99.99 percent (4 log) inactivation or removal of viruses, or both. Disinfection effectiveness shall be determined by the calculation of "CT" values as specified in the March 1991 edition of EPA's "Guidance Manual For Compliance With The Filtration And Disinfection Requirements For Public Water Systems Using Surface Water Sources." A copy of such guidance manual may be obtained from EPA at http://www.epa.gov/safewater/mdbp/guidsws.pdf.

(ii) The RDC in the water entering the distribution system, measured as specified in 40 CFR 141.74(a)(2), as amended from time to time, and subsection (e)(7)(S)(ii) of this section shall not be less than 0.2 mg/l for more than 4 hours.

(iii) The RDC in the distribution system, measured as free chlorine, combined chlorine, or chlorine dioxide, as specified in 40 CFR 141.74(a)(2), as amended from time to time, and subsection (e)(7)(S)(ii) of this section, shall not be undetectable in more than 5 percent of the samples each month for any 2 consecutive months that the system serves water to the public. Water in the distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml, measured as heterotrophic plate count (HPC) as specified in 40 CFR 141.74(a)(1), as amended from time to time, is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement in subsection

(j)(3)(B)(iii) of this section. The value "V" in the following formula shall not exceed 5 percent in 1 month, for any 2 consecutive months.

Where:

A = Number of instances where the RDC is measured;

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

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

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

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

(4) Filtration. A Subpart H system that provides and operates treatment pursuant to subdivision (2) of this subsection, shall provide filtration which complies with the requirements of subparagraphs (A), (B), (C), or (D) of this subdivision.

(A) Conventional filtration treatment or direct filtration.

(i) For such Subpart H systems using conventional or direct filtration, the turbidity level of representative samples of the combined filtered water of such Subpart H system using conventional or direct filtration shall be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month pursuant to subsection (e)(7)(S)(i) of this section.

(ii) The turbidity level of representative samples of such Subpart H system's combined filtered water (treatment effluent) shall at no time exceed 1 NTU, measured pursuant to subsection (e)(7)(S)(i) of this section.

(iii) Such Subpart H system that is required to submit a report to the department for a self assessment or comprehensive performance evaluation under subsection (h)(6)(B)(i) of this section shall implement the improvements identified in accordance with a schedule as approved in writing by the department.

(B) Slow sand filtration. For such Subpart H systems using slow sand filtration, the turbidity level of representative samples of the combined filtered water of such Subpart H system using slow sand filtration shall be less than or equal to 1 NTU in all of the measurements taken each month, measured as specified in 40 CFR 141.74(a)(1) and (c)(1), as amended from time to time, and subsection (e)(7)(S)(i) of this section.

(C) Diatomaceous earth filtration. For such Subpart H systems using diatomaceous earth filtration, the turbidity level of representative samples of the combined filtered water of such Subpart H system using diatomaceous earth filtration shall be less than or equal to 1 NTU in all of the measurements taken each month, measured as specified in 40 CFR 141.74(a)(1) and (c)(1), as amended from time to time, and subsection (e)(7)(S)(i) of this section.

(D) Other filtration technologies. Such Subpart H system may use filtration technology not listed in subparagraphs (A) through (C), inclusive, of this subdivision if such Subpart H system demonstrates to the department, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of subdivision (3)(B) of this subsection, consistently achieves 99.9 percent (3 log) removal or inactivation of Giardia lamblia cysts, or both, and 99.99 percent (4 log) removal or inactivation of viruses, or both, and 99 percent (2 log) removal of

Cryptosporidium oocysts, and the department approves such Subpart H system's use of such alternative filtration treatment. To request approval to use alternative filtration technology, such Subpart H system shall submit an application to the department in accordance with subsection (t) of this section. If the department approves such Subpart H system's use of the alternative filtration technology, the department shall set turbidity performance requirements that such Subpart H system shall meet at least 95 percent of the time and that such Subpart H system shall not exceed at any time a level that consistently achieves 99.9 percent (3 log) removal or inactivation of Giardia lamblia cysts, or both, 99.99 percent (4 log) removal or inactivation of viruses, or both, and 99 percent removal of Cryptosporidium oocysts. For such Subpart H system that makes this demonstration, the requirements of subparagraphs (3)(B) and (4)(A) of subsection apply.

(E) A system serving 10,000 or more persons shall achieve 99 percent (2 log) removal of Cryptosporidium. Systems serving fewer than 10,000 persons shall achieve 99 percent (2 log) removal of Cryptosporidium. A system is deemed to be in compliance with this requirement if the system meets the combined filtered water turbidity level requirements of subparagraphs (A) through (D), inclusive, of this subdivision.

(F) Any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes shall return these flows through the processes of a system's existing conventional or direct filtration or at an alternate location approved by the department by June 8, 2004.

(5) Treatment techniques for acrylamide and epichlorohydrin. Each system shall certify annually in writing to the department that when acrylamide and epichlorohydrin are used in systems, the combination of dose and monomer level does not exceed the levels specified in 40 CFR 141.111, as amended from time to time.

(6) General requirements for the control of lead and copper.

(A) Applicability. The requirements of this subdivision and subsections (e)(7)(K), (e)(8) through (e)(10), inclusive, (h)(5), (i)(6), (j)(7) through (j)(10), inclusive, and (l)(1)(G) of this section constitute the drinking water regulations for lead and copper. Unless otherwise indicated, each of the provisions of this subdivision applies to CWSs and NTNCs.

(B) Lead and copper action levels.

(i) The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with subsection (e)(8) of this section is greater than 0.015 mg/l (i.e., if the "90th percentile" lead level is greater than 0.015 mg/l).

(ii) The copper action level is exceeded if the concentration of copper in more than10 percent of tap water samples collected during any monitoring period conducted in accordance with subsection (e)(8) of this section is greater than 1.3 mg/l (i.e., if the "90th percentile" copper level is greater than 1.3 mg/l).

(iii) The 90th percentile lead and copper levels shall be computed as follows:

(I) The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal

to the total number of samples taken.

(II) The number of samples taken during the monitoring period shall be multiplied by 0.9.

(III) The contaminant concentration in the numbered sample yielded by the calculation in subclause (II) of this clause is the 90th percentile contaminant level.

(IV) For CWSs and NTNCs serving fewer than 100 people that collect 5 samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

(V) For a CWS or NTNC that collects fewer than 5 samples in accordance with subsection (e)(8)(C) of this section, the sample result with the highest concentration is considered the 90th percentile value.

(C) Corrosion control treatment requirements.

(i) All CWSs and NTNCs shall install and operate optimal corrosion control treatment.

(ii) Any CWS or NTNC that complies with the applicable corrosion control treatment requirements approved by the department under subdivisions (7) and (8) of this subsection shall be deemed to be in compliance with the treatment requirement contained in clause (i) of this subparagraph.

(D) Source water treatment requirements. Any CWS or NTNC exceeding the lead or copper action level shall implement all applicable source water treatment requirements approved by the department under subdivision (9) of this subsection.

(E) Lead service line replacement requirements. Any CWS or NTNC exceeding the lead action level after implementation of applicable corrosion control and source water treatment requirements shall complete the lead service line replacement requirements contained in subdivision (10) of this subsection.

(F) Public education requirements.

(i) Pursuant to subsection (i)(6) of this section, all CWSs and NTNCs shall provide a consumer notice of lead tap water monitoring results to persons served at the sites (taps) that are tested. Any CWS or NTNC exceeding the lead action level shall implement the public education requirements.

(ii) Any CWS or NTNC exceeding the copper action level shall notify consumers as required in subsection (i)(5)(A) of this section.

(G) Monitoring and analytical requirements. Tap water monitoring for lead and copper, monitoring for water quality parameters, source water monitoring for lead and copper, and analyses of the monitoring results under this subdivision shall be completed in compliance with subsections (e)(7)(K) and (e)(8) through (e)(10), inclusive, of this section.

(H) Reporting requirements. CWSs and NTNCs shall report to the department any information required by the treatment provisions of this subdivision and subsection (h)(5) of this section.

(I) Recordkeeping requirements. CWSs and NTNCs shall maintain records in accordance with subsection (l)(1)(G) of this section.

(J) Violation of drinking water regulations. Failure to comply with the applicable requirements of this subdivision and subsections (e)(7)(K), (e)(8) through (e)(10), inclusive, (h)(5), (i)(6), (j)(7) through (j)(10), inclusive, and (l)(1)(G) of this section, including requirements established by the department pursuant to these provisions, shall constitute a

violation of the drinking water regulations for lead or copper, or both.

(7) Applicability of corrosion control treatment steps to small, medium-size and large systems. Unless otherwise indicated, the provisions of subsection (j)(7) of this section apply to CWSs and NTNCs.

(A) CWSs and NTNCs shall complete the applicable corrosion control treatment requirements described in subdivision (8) of this subsection by the deadlines established in this subdivision.

(i) A large CWS or NTNC (serving greater than 50,000 persons) shall complete the corrosion control treatment steps specified in subparagraph (D) of this subdivision, unless the CWS or NTNC is deemed by the department to have optimized corrosion control under subparagraph (B)(ii) or (B)(iii) of this subdivision.

(ii) A small CWS or NTNC (serving less than or equal to 3,300 persons) and a medium-size CWS or NTNC (serving greater than 3,300 and less than or equal to 50,000 persons) shall complete the corrosion control treatment steps specified in subparagraph (D) of this subdivision, unless the CWS or NTNC is deemed by the department to have optimized corrosion control under subparagraph (B)(i), (ii) or (iii) of this subdivision.

(B) Deemed optimized corrosion control. A CWS or NTNC is deemed to have optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this subdivision if the CWS or NTNC satisfies 1 of the criteria specified in clauses (i) through (iii), inclusive, of this subparagraph. Any such CWS or NTNC deemed to have optimized corrosion control under this subparagraph, and which has treatment in place, shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the department determines appropriate to ensure optimal corrosion control treatment is maintained.

(i) Deemed to have optimized corrosion control by meeting lead and copper action levels. A small or medium-size CWS or NTNC is deemed to have optimized corrosion control if the CWS or NTNC meets the lead and copper action levels during each of 2 consecutive 6 month monitoring periods conducted in accordance with subsection (e)(8) of this section.

(ii) Deemed to have optimized corrosion control by the department. Any CWS or NTNC may be deemed by the department to have optimized corrosion control treatment if the CWS or NTNC demonstrates to the satisfaction of the department that the CWS or NTNC has conducted activities equivalent to the corrosion control steps applicable to such CWS or NTNC under this subdivision. If the department makes this determination, the department shall provide the CWS or NTNC with written notice explaining the basis for the department's decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with subdivision (8)(F) of this subsection. CWSs and NTNCs deemed to have optimized corrosion control under this clause shall operate in compliance with the department-designated optimal water quality control parameters in accordance with subdivision (8)(G) of this subsection and continue to conduct lead and copper tap and water quality parameter sampling in accordance with subsections (e)(8)(D)(iii) and (e)(9)(D) of this section, respectively. A CWS or NTNC shall provide the department with the following information in order to support a determination under this subparagraph:

(I) The results of all test samples collected for each of the water quality parameters listed

in subdivision (8)(C)(iii) of this subsection;

(II) A report explaining the test methods used by the CWS or NTNC to evaluate the corrosion control treatments listed in subdivision (8)(C)(i) of this subsection, the results of all tests conducted, and the basis for the CWS's or NTNC's selection of optimal corrosion control treatment;

(III) A report explaining how corrosion control has been installed and how it is being maintained to ensure minimal lead and copper concentrations at consumers' taps; and

(IV) The results of tap water samples collected in accordance with subsection (e)(8) of this section at least once every 6 months for 1 year after corrosion control has been installed.

(iii) Deemed to have optimized corrosion control based on tap water and source water monitoring results. Any CWS or NTNC is deemed to have optimized corrosion control if the CWS or NTNC submits results of tap water monitoring conducted in accordance with subsection (e)(8) of this section and source water monitoring conducted in accordance with subsection (e)(10) of this section that demonstrate for 2 consecutive 6 month monitoring periods that the difference between the 90th percentile tap water lead level computed under subdivision (6)(B)(iii) of this subsection and the highest source water lead concentration is less than the PQL for lead of 0.005 mg/l.

(I) Those CWSs and NTNCs whose highest source water lead level is below the method detection limit may also be deemed to have optimized corrosion control under this clause if the 90th percentile tap water lead level is less than or equal to the PQL for lead for 2 consecutive 6 month monitoring periods.

(II) Any CWS or NTNC deemed to have optimized corrosion control in accordance with this clause shall continue monitoring for lead and copper at the tap, no less frequently than once every 3 calendar years using the reduced number of sites specified in subsection (e)(8)(C) of this section and collecting the samples at times and locations specified in subsection (e)(8)(D)(iv) of this section.

(III) Any CWS or NTNC deemed to have optimized corrosion control pursuant to this clause shall notify the department in writing pursuant to subsection (h)(5)(A)(iii) of this section of any upcoming long-term change in treatment or addition of a new source as described in subsection (h)(5)(A)(iii) of this section. Before a CWS or NTNC adds a new source or implements a long-term change in treatment, the CWS or NTNC shall submit an application to the department requesting approval of the addition of a new source or long-term change in treatment. Such application shall include a description of the change or addition, and shall be submitted in accordance with subsection (t) of this section. A CWS or NTNC shall not add a new source or implement a long-term change in treatment until the CWS or NTNC has obtained the department's approval. For purposes of this section, long-term change in treatment includes, but is not limited to, the addition of a new treatment process or modification of an existing treatment process. The department may require any such CWS or NTNC to conduct additional monitoring or to take other action the department deems appropriate to ensure that such CWS or NTNC maintains minimal levels of corrosion in its distribution system.

(IV) A CWS or NTNC is not deemed to have optimized corrosion control under this clause, and shall implement corrosion control treatment pursuant to subclause (V) of this clause, unless the CWS or NTNC meets the copper action level.

(V) Any CWS or NTNC that is required to implement corrosion control because the CWS or NTNC is no longer deemed to have optimized corrosion control under this clause shall implement corrosion control treatment in accordance with the deadlines in subparagraph (D) of this subdivision. The time periods for completing each step are determined by the date the CWS or NTNC is no longer deemed to have optimized corrosion control under this clause.

(C) Any small or medium-size CWS or NTNC that is required to complete the corrosion control steps because the CWS or NTNC exceeded the lead or copper action level may cease completing the treatment steps whenever the CWS or NTNC meets both action levels during each of 2 consecutive monitoring periods conducted pursuant to subsection (e)(8) of this section and submits the results to the department. If any such CWS or NTNC thereafter exceeds the lead or copper action level during any monitoring period, the CWS or NTNC (or the department, as the case may be) shall recommence completion of the applicable treatment steps, beginning with the first treatment step that was not previously completed in its entirety. The department may require a CWS or NTNC to repeat treatment steps previously completed by the CWS or NTNC where the department determines that this is necessary to properly implement the treatment requirements of this subdivision. The department shall notify the CWS or NTNC in writing of such a determination and explain the basis for the department's decision. The requirement for any small or medium-size CWS or NTNC to implement corrosion control treatment steps in accordance with subparagraph (D) of this subdivision, including systems deemed to have optimized corrosion control under subparagraph (D) of this subdivision, is triggered whenever any small or medium-size CWS or NTNC exceeds the lead or copper action level.

(D) Treatment steps and deadlines. Except as provided in subparagraph (B) of this subdivision, CWSs and NTNCs shall complete the following corrosion control treatment steps (described in the referenced portions of subdivision (8) of this subsection and subsections (e)(8) and (e)(9) of this section) by the indicated time periods.

(i) Step 1: The CWS or NTNC shall conduct initial tap water sampling in accordance with subsections (e)(8)(D) and (e)(9)(B) of this section until the CWS or NTNC either exceeds the lead or copper action level or becomes eligible for reduced monitoring under subsection (e)(8)(D)(iv) of this section. A CWS or NTNC exceeding the lead or copper action level shall submit to the department for review and approval the CWS's or NTNC's recommended optimal corrosion control treatment not later than 6 months after the end of the monitoring period during which the CWS or NTNC exceeds 1 of the action levels. The CWS's or NTNC's recommended optimal corrosion control treatment shall be submitted to the department in accordance with subsection (t) of this section. The department may approve the CWS's or NTNC's recommended optimal corrosion control treatment. If the department does not approve the CWS's or NTNC's recommended corrosion control treatment, the department shall designate the corrosion control treatment that the CWS or NTNC is required to implement.

(ii) Step 2: Not later than 12 months after the end of the monitoring period during which a CWS or NTNC exceeds the lead or copper action level, the department may require the CWS or NTNC to perform corrosion control studies in accordance with subdivision (8)(B) of this subsection. If the department requires the CWS or NTNC to perform such studies,

the CWS or NTNC shall submit copies of such studies to the department for the department's review and approval in accordance with subsection (t) of this section. If the department does not require the CWS or NTNC to perform such studies, the CWS or NTNC shall install the CWS's or NTNC's department-approved optimal corrosion control treatment, or, if the department did not approve the CWS's or NTNC's recommended corrosion control treatment, the corrosion control treatment designated by the department (as described in subdivision (8)(D)(i) of this subsection) within the following time frames:

(I) For large CWSs and NTNCs, not later than 6 months after the end of the monitoring period during which such CWS or NTNC exceeds the lead and copper action level;

(II) For medium-size CWSs and NTNCs, not later than 18 months after the end of the monitoring period during which such CWS or NTNC exceeds the lead or copper action level; and

(III) For small CWSs and NTNCs, not later than 24 months after the end of the monitoring period during which such CWS or NTNC exceeds the lead or copper action level.

(iii) Step 3: If the department requires a CWS or NTNC to perform corrosion control studies under (Step 2, clause (ii) of this subparagraph, the CWS or NTNC shall complete the studies in accordance with subdivision (8)(C) of this subsection not later than 18 months after the department requires that such studies be conducted. In the CWS's or NTNC's corrosion control study, the CWS or NTNC shall recommend an optimal corrosion control treatment for department approval.

(iv) Step 4: If the CWS or NTNC has performed corrosion control studies under Step 2, clause (ii) of this subparagraph, the CWS or NTNC shall submit such corrosion control studies, including the CWS's or NTNC's recommended optimal corrosion control treatment, to the department for review and approval in accordance with subsection (t) of this section. Not later than 6 months after the CWS's or NTNC's completion of Step 3 in clause (iii) of this subdivision, the department may approve the CWS's or NTNC's recommended optimal corrosion control treatment or not approve the CWS's or NTNC's recommended corrosion control treatment and require the CWS or NTNC to implement the corrosion control treatment designated by the department, unless the department requires additional information from the CWS or NTNC or additional time to complete the department's review.

(v) Step 5: The CWS or NTNC shall install and have operational the optimal corrosion control treatment approved by the department or, if the department did not approve the CWS's or NTNC's recommended corrosion control treatment, the corrosion control treatment designated by the department (subdivision (8)(E) of this subsection) not later than 24 months after the department approves or designates such treatment.

(vi) Step 6: The CWS or NTNC shall complete follow-up sampling in accordance with subsections (e)(8)(D)(ii) and (e)(9)(C) of this section not later than 36 months after the department either approves the CWS's or NTNC's recommended optimal corrosion control treatment or the department designates an optimal corrosion control treatment.

(vii) Step 7: The department shall review the CWS's or NTNC's installation of treatment and designate optimal water quality control parameters in accordance with subdivision (8)(F) of this subsection not later than 6 months after completion of Step 6, clause (vi), of this subparagraph.

(viii) Step 8: The CWS or NTNC shall operate in compliance with the department-designated optimal water quality control parameters under subdivision (8)(G) of this subsection and continue to conduct tap water sampling pursuant to subsection (e)(8)(D)(iii) and (e)(9)(D) of this section.

(8) Description of corrosion control treatment requirements. Each CWS or NTNC shall complete the corrosion control treatment requirements described in this subdivision that are applicable to such CWS or NTNC under subdivision (7)(A) of this subsection. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) A CWS's or NTNC's recommendation regarding corrosion control treatment. Based upon the results of lead and copper tap water monitoring and water quality parameter monitoring, small and medium-size CWSs and NTNCs exceeding the lead or copper action level shall propose installation of 1 or more of the corrosion control treatments in subparagraph (C)(i) of this subdivision. The department may require the CWS or NTNC to conduct additional water quality parameter monitoring in accordance with subsection (e)(9)(B) of this section to assist the department in reviewing the CWS's or NTNC's proposal.

(B) Department's decision to require studies of corrosion control treatment (applicable to small and medium-size CWSs and NTNCs). The department may require any small or medium-size CWS or NTNC that exceeds the lead or copper action level to perform corrosion control studies under subparagraph (C) of this subdivision to identify optimal corrosion control treatment for the CWS or NTNC.

(C) Performance of corrosion control studies.

(i) Any CWS or NTNC performing corrosion control studies shall evaluate the effectiveness of each of the following treatments, and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment for that CWS or NTNC:

(I) Alkalinity and pH adjustment;

(II) Calcium hardness adjustment; and

(III) The addition of a phosphate or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap water samples.

(ii) The CWS or NTNC shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other CWSs and NTNCs of similar size, water chemistry and distribution system configuration.

(iii) The CWS or NTNC shall measure the following water quality parameters in any tests conducted under this subparagraph before and after evaluating the corrosion control treatments listed in clause (i) of this subparagraph:

(I) Lead;

(II) Copper;

(III) pH;

(IV) Alkalinity;

(V) Calcium;

(VI) Conductivity;

(VII) Orthophosphate (when an inhibitor containing a phosphate compound is used);

(VIII) Silicate (when an inhibitor containing a silicate compound is used); and

(IX) Water temperature.

(iv) The CWS or NTNC shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and document such constraints with at least 1 of the following:

(I) Data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another CWS or NTNC with comparable water quality characteristics; or

(II) Data and documentation demonstrating that the CWS or NTNC has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes; or

(III) Data and documentation in subclauses (I) and (II) of this clause.

(v) The CWS or NTNC shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(vi) On the basis of an analysis of the data generated during each evaluation, the CWS or NTNC shall submit to the department for approval the CWS's or NTNC's recommended treatment option that the corrosion control studies indicate constitutes the optimal corrosion control treatment for that CWS or NTNC. Such application shall include the reason or reasons for the CWS's or NTNC's recommended treatment option, including all supporting documentation specified in clauses (i) through (v), inclusive, of this subparagraph, and shall be submitted in accordance with subsection (t) of this section.

(D) Department designation of optimal corrosion control treatment.

(i) Based upon consideration of available information including, where applicable, studies performed under subparagraph (C) of this subdivision and a CWS's or NTNC's recommended treatment option, the department may either approve or reject with written reasons the CWS's or NTNC's application requesting approval of the CWS's or NTNC's corrosion control treatment option. If rejected, the CWS or NTNC shall propose an alternative corrosion control treatment(s) from among those listed in subparagraph (C)(i) of this subdivision, or revise the original proposal based on the department's recommendations, and then resubmit the proposal or revision for department review and approval in accordance with subsection (t) of this section.

(ii) The department shall notify the CWS or NTNC of the department's decision in writing to approve or reject the CWS's or NTNC's application submitted to the department under clause (i) of this subparagraph and explain the basis for the department's determination. If the department requests additional information to aid the department's review, the CWS or NTNC shall provide the information.

(E) Installation of optimal corrosion control. Each CWS or NTNC shall properly install and operate throughout the CWS's or NTNC's distribution system the optimal corrosion control treatment approved by the department under subparagraph (D) of this subdivision.

(F) Department review of treatment and specification of optimal water quality control parameters.

(i) The department shall evaluate the results of all lead and copper tap water samples and water quality parameter samples submitted by the CWS or NTNC and determine whether the CWS or NTNC has properly installed and operated the optimal corrosion

control treatment approved by the department in accordance with subparagraph (D) of this subdivision. After the department reviews the results of tap water and water quality parameter monitoring by the CWS or NTNC, both before and after the CWS or NTNC installs optimal corrosion control treatment, the CWS or NTNC shall operate in accordance with specific parameter values defined by the department that are within the following water quality parameter ranges in subclauses (i) though (vi) of this subparagraph, unless the CWS or NTNC can demonstrate to the satisfaction of the department that other measurable parameter values are necessary for optimal corrosion control treatment:

(I) For pH measured at each entry point to the distribution system, a range of 7.0 to 10.0 shall be maintained;

(II) A minimum pH value, measured in all tap water samples. Such value shall be equal to or greater than 7.0, unless the department determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for the CWS or NTNC to optimize corrosion control;

(III) If a corrosion inhibitor is used, concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap water samples, shall be maintained within the following ranges:

Corrosion Inhibitor	**Range (mg/l)**
Silicates	2.0 - 12.0
Orthophosphate	0.1 - 10.0

(IV) If alkalinity is adjusted as part of optimal corrosion control treatment, a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap water samples, shall be determined based on the results of tap water and water quality parameter monitoring; and

(V) If calcium carbonate stabilization is used as part of corrosion control, a range of concentrations for calcium, measured in all tap water samples, shall be determined based on the results of tap water and water quality parameter monitoring.

(ii) The values for the applicable water quality control parameters listed in clause (i) of this subparagraph shall be those that the department determines to reflect optimal corrosion control treatment for the CWS or NTNC. The department may designate values for additional water quality control parameters determined by the department to reflect optimal corrosion control for the CWS or NTNC. The department shall notify the CWS or NTNC in writing of these determinations and explain the basis for the department's decisions.

(G) Continued operation and monitoring. All CWSs and NTNCs optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the department under subparagraph (F)(i) of this subdivision in accordance with this subparagraph for all samples collected under subsections (e)(9)(D) through (F), inclusive, of this section. Compliance with the requirements of this subparagraph shall be determined every 6 months, as specified under subsection (e)(9)(D) of this section. A CWS or NTNC is out of compliance with the requirements of this subparagraph in a 6 month period if the CWS or NTNC has excursions for any department-specified parameter on more than 9 calendar days during the period. An excursion occurs whenever the daily value for 1 or more of the water quality parameters measured at a sampling location is below the

minimum value or outside the range designated by the department. Daily values are calculated as indicated in clauses (i) through (iii), inclusive, of this subparagraph. The department has discretion to delete results of obvious sampling errors from this calculation.

(i) On days when more than 1 measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day, regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both.

(ii) On days when only 1 measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(iii) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

(H) Modification of department treatment decisions. Upon the department's own initiative or in response to a request by a CWS or NTNC or other interested party, the department may modify the department's determination of the optimal corrosion control treatment under subparagraph (D) of this subdivision or optimal water quality control parameters under subparagraph (F) of this subdivision. If a CWS or NTNC or other interested party seeks a modification of the department's approved optimal corrosion control treatment or optimal water quality control parameters, the CWS or NTNC or other interested party shall submit an application to the department requesting a modification of the department's determination. Such application shall include an explanation as to the reason or reasons that the modification is appropriate and documentation supporting the proposed modification and shall be submitted in accordance with subsection (t) of this section. The department may modify the department's prior determination if the department concludes that such change is necessary to ensure that the CWS or NTNC continues to optimize corrosion control treatment. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the department's decision, and provide an implementation schedule for completing the treatment modifications.

(9) Source water treatment requirements. CWSs and NTNCs shall complete the applicable source water monitoring and treatment requirements under subparagraph (B) of this subdivision and subsections (e)(8) and (e)(10) of this section by the following deadlines. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) Deadlines for completing source water treatment steps.

(i) Step 1: A CWS or NTNC exceeding the lead or copper action level shall complete lead and copper source water monitoring in accordance with subsection (e)(10)(B) of this section and make a treatment proposal to the department in accordance with subparagraph (B)(i) of this subsection not later than 180 calendar days after the end of the monitoring period during which the lead or copper action level was exceeded.

(ii) Step 2: The department shall make a determination regarding source water treatment in accordance with subparagraph (B)(ii) of this subsection not later than 6 months after submission of monitoring results in Step 1, clause (i) of this subparagraph.

(iii) Step 3: If the department requires installation of source water treatment, the CWS or NTNC shall install the treatment in accordance with subparagraph (B)(iii) of this subsection not later than 24 months after completion of Step 2, clause (ii) of this

subparagraph.

(iv) Step 4: The CWS or NTNC shall complete follow-up tap water monitoring in accordance with subsection (e)(8)(D)(ii) of this section and source water monitoring in accordance with subsection (e)(10)(C) of this section not later than 36 months after completion of Step 2, clause (ii) of this subparagraph.

(v) Step 5: The department shall review the CWS's or NTNC's installation and operation of source water treatment and specify maximum permissible source water levels in accordance with subparagraph (B)(iv) of this subsection not later than 6 months after completion of Step 4, clause (iv) of this subparagraph.

(vi) Step 6: The CWS or NTNC shall operate in compliance with the department-specified maximum permissible lead and copper source water levels in accordance with subparagraph (B)(v) of this subsection and continue source water monitoring in accordance with subsection (e)(10)(D) of this section.

(B) Description of source water treatment requirements.

(i) CWS or NTNC treatment proposal. Any CWS or NTNC that exceeds the lead or copper action level shall propose in writing to the department the installation and operation of 1 of the source water treatments listed in clause (ii) of this subparagraph. A CWS or NTNC may propose that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users' taps.

(ii) Department determination regarding source water treatment. The department shall complete an evaluation of the results of all source water samples submitted by the CWS or NTNC to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users' taps. If the department determines that treatment is needed, the CWS or NTNC shall submit an application to the department requesting approval of a proposed source water treatment. Such application shall include the reason or reasons that the CWS or NTNC is proposing the source water treatment in the application and shall be submitted in accordance with subsection (t) of this section. The department shall review the application and either approve or reject with written reasons the installation and operation of the source water treatment proposed by the CWS or NTNC in the application submitted to the department. If rejected, the CWS or NTNC shall submit to the department an application requesting approval of the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration; or the CWS or NTNC shall revise the original proposal based upon the department's recommendations and resubmit this to the department for review in consideration for approval. Such application shall be submitted in accordance with subsection (t) of this section. If the department requests additional information to aid in the department's review, the CWS or NTNC shall provide the information by the date specified by the department in the department's request. The department shall notify the CWS or NTNC in writing of the department's determination and set forth the basis for the department's decision.

(iii) Installation of source water treatment. Each CWS or NTNC shall properly install and operate the source water treatment approved by the department under clause (ii) of this subparagraph.

(iv) Department review of source water treatment and specification of maximum

permissible source water levels. The department shall review the source water samples taken by the CWS or NTNC both before and after the CWS or NTNC installs source water treatment, and determine whether the CWS or NTNC has properly installed and operated the source water treatment approved by the department. Based upon the department's review, the department shall designate the maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment properly operated and maintained. The department shall notify the CWS or NTNC in writing and explain the basis for the department's decision.

(v) Continued operation and maintenance. Each CWS or NTNC shall maintain lead and copper levels below the maximum permissible concentrations designated by the department at each sampling point monitored in accordance with subsection (e)(10) of this section. The CWS or NTNC is out of compliance with this clause if the level of lead or copper at any sampling point is greater than the maximum permissible concentration designated by the department.

(vi) Modification of department treatment decisions. Upon the department's own initiative or in response to a request by a CWS or NTNC or other interested party, the department may modify the department's determination of the source water treatment under clause (ii) of this subparagraph, or maximum permissible lead and copper concentrations for finished water entering the distribution system under clause (iv) of this subparagraph. If a CWS or NTNC or other interested party seeks a modification of the department's approved optimal corrosion control treatment or optimal water quality control parameters, the CWS or NTNC or other interested party shall submit an application to the department requesting that the department modify the department's determination. Such application shall include an explanation as to the reason or reasons that the modification is appropriate and documentation supporting the proposed modification, and shall be submitted in accordance with subsection (t) of this section. The department may modify the department's determination if the department concludes that such change is necessary to ensure that the CWS or NTNC continues to minimize lead and copper concentrations in source water. A revised determination shall be made in writing, set forth the new treatment requirements, explain the basis for the department's decision, and provide an implementation schedule for completing the treatment modifications.

(10) Lead service line replacement requirements. Unless otherwise indicated, the provisions of this subdivision apply to CWSs and NTNCs.

(A) CWSs and NTNCs that fail to meet the lead action level in tap water samples taken pursuant to subsection (e)(8)(D)(ii) of this section, after installing corrosion control or source water treatment, whichever sampling occurs later, shall replace lead service lines in accordance with the requirements of this subdivision. If a CWS or NTNC is in violation of subdivisions (7) or (9) of this subsection for failure to install source water or corrosion control treatment, the department may require the CWS or NTNC to commence lead service line replacement under this subdivision after the date by which the CWS or NTNC was required to conduct monitoring under subsection (e)(8)(D)(ii) of this section has passed.

(B)

(i) A CWS or NTNC shall annually replace at least 7 percent of the initial number of

lead service lines in the CWS's or NTNC's distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The CWS or NTNC shall identify the initial number of lead service lines in the CWS's or NTNC's distribution system, including an identification of the portion(s) owned by the CWS or NTNC, based on a materials evaluation, including the evaluation required under subsection (e)(8)(A) of this section and relevant legal authorities, including but not limited to, contractual agreements, local land records and local land ordinances, regarding the portion owned by the CWS or NTNC. The first year of lead service line replacement shall begin on the first day following the end of the monitoring period in which the action level was exceeded under subparagraph (A) of this subdivision. If monitoring is required annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs. If the department has approved an alternate monitoring period under subsection (e)(8)(D)(iv)(IV)(1) of this section, then the end of the monitoring period is the last day of that period.

(ii) Any CWS or NTNC resuming a lead service line replacement program after the cessation of the CWS's or NTNC's lead service line replacement program under subparagraph (F) of this subdivision shall update the CWS's or NTNC's inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under subparagraph (C) of this subdivision. The CWS or NTNC will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that shall be replaced per year (7 percent lead service line replacement is based on a 15-year replacement program, e.g., CWSs and NTNCs resuming lead service line replacement after previously conducting 2 years of replacement would divide the updated inventory by 13). For those CWSs and NTNCs that have completed a 15-year lead service line replacement program, the department shall determine a schedule for replacing or retesting lines that were previously tested out under the replacement program when the CWS or NTNC re-exceeds the action level.

(C) A CWS or NTNC is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to subsection (e)(8)(B)(iii) of this section, is less than or equal to 0.015 mg/l.

(D) A CWS or NTNC shall replace that portion of the lead service line that the CWS or NTNC owns. In cases where the CWS or NTNC does not own the entire lead service line, the CWS or NTNC shall notify the owner of the line, or the owner's authorized agent, that the CWS or NTNC will replace the portion of the service line that the CWS or NTNC owns and shall offer to replace the owner's portion of the line. A CWS or NTNC is not required to bear the cost of replacing the privately-owned portion of the line, nor is the CWS or NTNC required to replace the privately-owned portion where the owner chooses not to pay the cost of replacing the privately-owned portion of the line, or where replacing the privately-owned portion would be precluded by state, local or common law. A CWS or NTNC that does not replace the entire length of the service line also shall complete the following tasks:

(i) At least 45 calendar days prior to commencing with the partial replacement of a lead service line, the CWS or NTNC shall provide notice to the resident(s) of all buildings served

by the line, explaining that the residents may experience a temporary increase of lead levels in the residents' drinking water, along with guidance on measures consumers can take to minimize consumers' exposure to lead. The department may allow the CWS or NTNC to provide notice less than 45 calendar days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the CWS or NTNC shall inform the resident(s) served by the line that the CWS or NTNC will, at the CWS's or NTNC's expense, collect a sample, from each partially-replaced lead service line that is representative of the water in the service line for analysis of lead content, as prescribed under subsection (e)(8)(B)(iii) of this section, not later than 72 hours after the completion of the partial replacement of the service line. The CWS or NTNC shall collect the sample and report the results of the analysis to the owner and the resident(s) served by the line not later than 3 business days after receiving the results. Mailed notices post-marked not later than 3 business days after receiving the results shall be considered "on time."

(ii) The CWS or NTNC shall provide, by mail or by other methods approved by the department, the information required by clause (i) of this subparagraph to the residents of individual dwellings. In instances where multi-family dwellings are served by the line, the CWS or NTNC shall have the option to post the information at a conspicuous location.

(E) The department shall require a CWS or NTNC to replace lead service lines on a shorter schedule than that required by this subdivision, taking into account the number of lead service lines in the CWS or NTNC, where such a shorter replacement schedule is feasible. The department shall make this determination in writing and notify the CWS or NTNC of the department's finding not later than 6 months after the CWS or NTNC is triggered into lead service line replacement based on monitoring referenced in subparagraph (A) of this subdivision.

(F) Any CWS or NTNC may cease replacing lead service lines whenever first-draw samples collected pursuant to subsection (e)(8)(B)(ii) of this section meet the lead action level during each of 2 consecutive monitoring periods and the CWS or NTNC submits the results in writing to the department. If first-draw tap water samples in any such CWS or NTNC thereafter exceed the lead action level, the CWS or NTNC shall recommence replacing lead service lines pursuant to subparagraph (B)(ii) of this subdivision.

(G) To demonstrate compliance with subparagraphs (A) through (D), inclusive, of this subdivision, a CWS or NTNC shall report to the department the information specified in subsection (h)(5)(E) of this section.

(11) Treatment technique for control of disinfection byproduct precursors. For systems using conventional filtration treatment that are required to comply with subdivision (2) of this subsection, enhanced coagulation or enhanced softening are identified as treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems.

(A) Applicability. Systems using conventional filtration treatment that are required to comply with subdivision (2) of this subsection shall operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in subparagraph (C) of this subdivision, unless it meets at least 1 of the alternative compliance criteria listed in this subparagraph. Systems using conventional filtration treatment that are required to comply with subdivision (2) of this subsection may use the alternative compliance criteria

listed in clauses (i) through (vi), inclusive, of this subparagraph to comply with this subdivision and in lieu of complying with subparagraph (B) of this subdivision. In all cases systems using conventional filtration treatment that are required to comply with subdivision (2) of this subsection shall still comply with monitoring requirements specified in subsection (e)(11)(A)(iii)(IV) of this section. Unless otherwise indicated, the provisions of this subdivision apply to systems using conventional filtration treatment that are required to comply with subdivision (2) of this subsection.

(i) Such system's source or treated water TOC level is less than 2.0 mg/l, calculated quarterly as a running annual average.

(ii) Such system's source water TOC level is less than 4.0 mg/l, calculated quarterly as a running annual average; the source water alkalinity is greater than 60 mg/l (as CaCO3), calculated quarterly as a running annual average; and the TTHM and HAA5 running annual averages are no greater than 0.040 mg/l and 0.030 mg/l, respectively.

(iii) The TTHM and HAA5 running annual averages are no greater than 0.040 mg/l and 0.030 mg/l, respectively, and such system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

(iv) Such system's source water (prior to any treatment) or finished water SUVA is less than or equal to 2.0 l/mg-m, measured monthly and calculated quarterly as a running annual average.

(v) The treated water alkalinity of such system with an enhanced softening is less than 60 mg/l (as CaCO3), measured monthly and calculated quarterly as a running annual average.

(vi) The treated water of such system with an enhanced softening demonstrates a removal of at least 10 mg/l of magnesium hardness (as CaCO3), measured monthly and calculated quarterly as a running annual average.

(B) Enhanced coagulation and enhanced softening performance requirements. Such system shall achieve the percent reduction of TOC specified in clause (i) of this subparagraph between the source water and the combined filter effluent, unless the department approves in writing such system's request for alternate minimum TOC removal (Step 2) requirements under clause (ii) of this subparagraph.

(i) Required Step 1 TOC reductions, as indicated in the following Table 11-A1 of this clause, are based upon specified source water parameters. Such system practicing softening is required to meet the Step 1 TOC reductions in the far-right column (Source water alkalinity >120 mg/l) for the specified source water TOC:

TABLE 11-A1. STEP 1 REQUIRED REMOVAL OF TOC BY ENHANCED COAGULATION AND ENHANCED SOFTENING

Source Water TOC, mg/l	Source Water Alkalinity, mg/l as $CaCO_3$		
	0-60	>60-120	>120[1]
>2.0-4.0	35.0%	25.0%	15.0%
>4.0-8.0	45.0%	35.0%	25.0%
>8.0	50.0%	40.0%	30.0%

[1] Such system practicing softening shall meet the TOC removal requirements in this column.

(ii) Such system that cannot achieve the Step 1 TOC reductions required by clause (i) of this subparagraph due to water quality parameters or operational constraints shall apply to the department, not later than 3 months after failure to achieve the TOC reductions required by clause (i) of this subparagraph, for approval of alternative minimum TOC (Step 2) removal requirements submitted by such system. If the department approves the alternative minimum TOC removal (Step 2) requirements, the department may make those requirements retroactive for the purposes of determining compliance. Until the department approves the alternate minimum TOC removal (Step 2) requirements, such system shall meet the Step 1 TOC reductions contained in clause (i) of this subparagraph. Alternate minimum TOC removal (Step 2) requirements shall be determined in accordance with 40 CFR 141.135(b)(4), as amended from time to time.

(C) Compliance calculations. Such systems, other than those identified in subparagraph (A) of this subdivision, shall comply with requirements contained in subparagraph (B) of this subdivision. Such system shall calculate compliance quarterly, beginning after such system has collected 12 months of data, by determining an annual average using the following method:

(i) Determine actual monthly TOC percent reductions, equal to: (1- (treated water TOC/source water TOC)) x 100;

(ii) Determine the required monthly TOC percent reductions, from either Table 11-A1 of this section or from subparagraph (B)(ii) of this subdivision;

(iii) Divide the value in clause (i) of this subparagraph by the value in clause (ii) of this subparagraph;

(iv) Add together the results of clause (iii) of this subparagraph for the last 12 months and divide by 12; and

(v) If the value calculated in clause (iv) of this subparagraph is less than 1.00, such system is not in compliance with the TOC percent reduction requirements.

(D) Such system may use the provisions in clauses (i) through (v), inclusive, of this subparagraph in lieu of the calculations in subparagraph (C) of this subdivision to determine compliance with TOC percent reduction requirements.

(i) In any month that such system's treated or source water TOC level is less than 2.0 mg/l, such system may assign a monthly value of 1.0 (in lieu of the value calculated in subparagraph (C)(iii) of this subdivision) when calculating compliance under the provisions of subparagraph (C) of this subdivision.

(ii) In any month that such system practicing softening removes at least 10 mg/l of magnesium hardness (as CaCO3), such system may assign a monthly value of 1.0 (in lieu of the value calculated in subparagraph (C)(iii) of this subdivision) when calculating compliance under the provisions of subparagraph (C) of this subdivision.

(iii) In any month that such system's source water SUVA, prior to any treatment, is less than or equal to 2.0 l/mg-m, such system may assign a monthly value of 1.0 (in lieu of the value calculated in subparagraph (C)(iii) of this subdivision) when calculating compliance under the provisions of subparagraph (C) of this subdivision.

(iv) In any month that such system's finished water SUVA is less than or equal to 2.0

l/mg-m, such system may assign a monthly value of 1.0 (in lieu of the value calculated in subparagraph (c)(iii) of this subdivision) when calculating compliance under the provisions of subparagraph (C) of this subdivision.

(v) In any month that such system practicing enhanced softening lowers such system's alkalinity below 60 mg/l (as CaCO3), such system may assign a monthly value of 1.0 (in lieu of the value calculated in subparagraph (C)(iii) of this subdivision) when calculating compliance under the provisions of subparagraph (C) of this subdivision.

(vi) Such systems may also comply with the requirements of subparagraph (C) of this subdivision by meeting the criteria in subparagraph (A) of this subdivision.

(12) Treatment technique requirements for the enhanced treatment for Cryptosporidium. The requirements of this subdivision apply to all Subpart H systems.

(A) Bin classification for Subpart H systems.

(i) Subpart H systems shall calculate an initial Cryptosporidium bin concentration for each plant for which monitoring is required. Calculation of the bin concentration shall use the Cryptosporidium results reported under 40 CFR 141.701(a) and shall follow the procedures in clauses (ii)(I) through (V), inclusive, of this subparagraph.

(ii)

(I) For Subpart H systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

(II) For Subpart H 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 are collected.

(III) For Subpart H systems that serve fewer than 10,000 people and monitor for Cryptosporidium for only 1 year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

(IV) For Subpart H systems with plants operating only part of the year that monitor fewer than 12 months per year under subsection (e)(7)(T)(ii)(IV) of this section, the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of Cryptosporidium monitoring. For purposes of this subdivision, a plant operates for only part of the year if the plant operates for less than 12 months out of a year.

(V) If the monthly Cryptosporidium sampling frequency varies, Subpart H systems shall first calculate a monthly average for each month of monitoring. Subpart H systems shall then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification in subclauses (I) through (IV), inclusive, of this clause.

(iii) Subpart H systems shall determine the Subpart H system's initial bin classification from Table 12-A1 of this clause and using the Cryptosporidium bin concentration calculated under clauses (i) through (ii) of this subparagraph.

TABLE 12-A1. BIN CLASSIFICATION FOR SUBPART H SYSTEMS

FOR SUBPART H SYSTEMS THAT ARE:	WITH A CRYPTOSPORIDIUM BIN CONCENTRATION OF…[1]	THE BIN CLASSIFICATION IS…

Required to monitor for Cryptosporidium under subsection (e)(7)(T)(ii) of this section	Less than 0.075 oocysts/L	Bin 1
	Greater than or equal to 0.075 oocysts/L and less than 1.0 oocysts/L	Bin 2
	Greater than or equal to 1.0 oocysts/L and less than 3.0 oocysts/L	Bin 3
	Greater than or equal to 3.0 oocysts/L	Bin 4
Serving fewer than 10,000 people and not required to monitor for Cryptosporidium under subsection (e)(7)(T)(ii)(II) of this section	N/A	Bin 1

[1] Based on calculations in clause (i) or (iv) of this subparagraph, as applicable.

(iv) Following completion of the second round of source water monitoring required under subsection (e)(7)(T)(ii)(I) of this section, a Subpart H system shall recalculate its Cryptosporidium bin concentration using the Cryptosporidium results reported under subsection (e)(7)(T)(ii)(I) of this section and follow the procedures in clauses (ii)(I) through (IV), inclusive, of this subparagraph. A Subpart H system shall then redetermine the Subpart H system's bin classification using this bin concentration and Table 12-A1 of this section.

(v)

(I) A Subpart H system shall submit to the department an application in accordance with subsection (t) of this section requesting approval of its bin classification under clause (iv) of this subparagraph. Such application shall be submitted to the department for approval not later than 6 months after the Subpart H system is required to complete the second round of source water monitoring based on the schedule in subsection (e)(7)(T)(ii)(II) of this section.

(II) The bin classification application submitted to the department under subclause (I) of this clause shall include a report containing a summary of source water monitoring data and the calculation procedure used to determine bin classification.

(vi) A Subpart H system shall submit to the department an application in accordance with subsection (t) of this section requesting approval of its bin classification under clause (iv) of this subparagraph. Such application shall be submitted to the department for approval not later than 6 months after the Subpart H system is required to complete the second round of source water monitoring based on the schedule in subsection (e)(7)(T)(ii)(II) of this section.

(B) Additional Cryptosporidium treatment requirements for Subpart H systems.

(i) A Subpart H system shall provide the level of additional treatment for Cryptosporidium specified in Table 12-B1 of this clause based on its bin classification as determined under subparagraph (A) of this subdivision and according to the schedule in

subparagraph (C) of this subdivision.

TABLE 12-B1. ADDITIONAL TREATMENT REQUIREMENTS FOR SUBPART H SYSTEMS

If the bin classification of a Subpart H system is…	And the Subpart H system uses the following filtration treatment in full compliance with subdivisions (2) through (4), inclusive, of this subsection and subsections (e)(7)(H), (e)(7)(R), (e)(7)(S), and (h)(6) of this section (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	The total Cryptosporidium removal and inactivation is at least 4.0 log.
Bin 3	2 log treatment	2.5 log treatment	2 log treatment	The total Cryptosporidium removal and inactivation is at least 5.0 log.
Bin 4	2.5 log treatment	3 log treatment	2.5 log treatment	The total Cryptosporidium removal and inactivation is at least 5.5 log.

(ii) A Subpart H system shall use 1 or more of the treatment and management options listed in subdivision (13)(A) of this subsection, termed the microbial toolbox, to comply with the additional Cryptosporidium treatment required by clause (i) of this subparagraph.

(iii) A Subpart H system classified in Bin 3 and Bin 4 shall achieve at least 1 log of the additional Cryptosporidium treatment required under clause (i) of this subparagraph using 1 or more of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as described in subdivisions (13)(B) through (F), inclusive, of this subsection.

(iv) Failure by a Subpart H system in any month to achieve treatment credit by meeting criteria in subdivisions (13)(B) through (F), inclusive, of this subsection for microbial toolbox options that is at least equal to the level of treatment required in clause (i) of this subparagraph is a violation of the treatment technique requirement.

(v) If the department determines during a sanitary survey or an equivalent source water assessment that after a Subpart H system completed the monitoring conducted under 40 CFR 141.701(a) or subsection (e)(7)(T)(ii)(I) of this section, significant changes occurred in its watershed that could lead to increased contamination of the source water by

Cryptosporidium, the Subpart H system shall take actions specified by the department to address the contamination. These actions may include additional source water monitoring or implementing microbial toolbox options, or both, in subdivision (13)(A) of this subsection.

(C) Schedule for compliance with Cryptosporidium treatment requirements.

(i) Following initial bin classification under subparagraph (A)(iii) of this subdivision, a Subpart H system that serves ≥ 10,000 people shall provide the level of treatment for Cryptosporidium required under subparagraph (B) of this subdivision, unless the department previously approved under 40 CFR 141.713(c) up to an additional 24 months for compliance with the Cryptosporidium treatment requirements because the Subpart H system is making capital improvements to comply with the Cryptosporidium treatment requirements, in which case the Subpart H system shall provide the level of treatment for Cryptosporidium required under subparagraph (B) of this subdivision by the department-approved compliance date. A system supplied by a Subpart H system that serves < 10,000 people shall provide the level of treatment for Cryptosporidium required under subparagraph (B) of this subdivision not later than October 1, 2014, unless the department approves under clause (ii)(II) of this subparagraph up to an additional 24 months for compliance with the Cryptosporidium treatment requirements because the Subpart H system is making capital improvements to comply with the Cryptosporidium treatment requirements, in which case the Subpart H system shall provide the level of treatment for Cryptosporidium required under subparagraph (B) of this subdivision by the department-approved compliance date.

(ii) Cryptosporidium treatment compliance dates.

(I) A Subpart H system that serves ≥ 10,000 people shall comply with the Cryptosporidium treatment requirements, unless the department previously approved under 40 CFR 141.713(c) up to an additional 24 months for compliance because the Subpart H system is making capital improvements to comply with the Cryptosporidium treatment requirements, in which case the Subpart H system shall comply with the Cryptosporidium treatment requirements by the department-approved compliance date.

(II) A Subpart H system that serves < 10,000 people shall comply with the Cryptosporidium treatment requirements not later than October 1, 2014. A Subpart H system that serves < 10,000 people may submit an application to the department requesting approval of up to an additional 24 months for complying with the Cryptosporidium treatment requirements if the Subpart H system that serves < 10,000 people is making capital improvements in order to comply with such requirements. Such application shall include the reason or reasons for requesting such additional time, including the capital improvements the Subpart H system that serves < 10,000 people is making and the schedule for completion of such improvements, and shall be submitted in accordance with subsection (t) of this section.

(iii) If the bin classification for a Subpart H system changes following the second round of source water monitoring, as determined under subparagraph (A)(iv) of this subdivision, the Subpart H system shall provide the level of treatment for Cryptosporidium required under subparagraph (B) of this subdivision on a schedule approved by the department. The Subpart H system shall submit an application to the department requesting approval of a schedule on which the Subpart H system shall provide the level of treatment for

Cryptosporidium required under subparagraph (B) of this subdivision. Such application shall be submitted in accordance with subsection (t) of this section.

(13) Requirements for microbial toolbox components. The requirements of this subdivision apply to all Subpart H systems.

(A) Microbial toolbox options for meeting Cryptosporidium treatment requirements. A Subpart H system may submit an application in accordance with subsection (t) of this section to the department requesting approval to receive the treatment credits listed in Table 13-A1 of this subparagraph. Such application shall include documentation demonstrating that the Subpart H system meets the conditions for microbial toolbox options described in subparagraphs (B) through (F), inclusive, of this subdivision. The department may approve the receipt of such credits by a Subpart H system if the Subpart H system meets the conditions for microbial toolbox options in subparagraphs (B) through (F), inclusive, of this subdivision. If the department approves the receipt of the treatment credits by a Subpart H system, the Subpart H system may apply such credits to meet the treatment requirements in subparagraph (B) of this subdivision.

TABLE 13-A1. 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	
(i) Watershed control program	0.5 log credit for department-approved program comprising required elements, annual program status report to department, and regular watershed survey. Specific criteria are in subparagraph (B)(i) of this subdivision.
(ii) Alternative source/intake management	No prescribed credit. Subpart H systems may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. Specific criteria are in subparagraph (B)(ii) of this subdivision.
Pre-Filtration Toolbox Options	
(iii) 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 department-approved performance criteria. To be eligible, basins shall be operated continuously with coagulant addition and all plant flow shall pass through basins. Specific criteria are in subparagraph (C)(i) of this subdivision.
(iv) Two-stage lime softening	0.5 log credit for two-stage softening where chemi

	cal addition and hardness precipitation occur in both stages. All plant flow shall pass through both stages. Single-stage softening is credited as equivalent to conventional filtration treatment. Specific criteria are in subparagraph (C)(ii) of this subdivision.
(v) Bank filtration	0.5 log credit for 25-foot setback; 1.0 log credit for 50-foot setback; aquifer shall be unconsolidated sand containing at least 10 percent fines; average turbidity in wells shall be less than 1 nephelolometric turbidity unit (NTU). Subpart H systems using wells followed by filtration when conducting source water monitoring shall sample the well to determine bin classification and are not eligible for additional credit. Specific criteria are in subparagraph (C)(iii) of this subdivision.
Treatment Performance Toolbox Options	
(vi) 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 subparagraph (D)(i) of this subdivision.
(vii) 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 2 consecutive measurements in any filter. Specific criteria are in subparagraph (D)(ii) of this subdivision.
Additional Filtration Toolbox Options	
(viii) 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 subparagraph (E)(i) of this subdivision.
(ix) 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 subparagraph (E)(i) of this subdivision.
(x) Membrane filtration	Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. Specific criteria are in subparagraph (E)(ii) of this subdivision.

(xi) 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 subparagraph (E)(iii) of this subdivision.
(xii) 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 subparagraph (E)(iv) of this subdivision.
Inactivation Toolbox Options	
(xiii) Chlorine dioxide	Log credit based on measured CT in relation to CT table. Specific criteria are in subparagraph (F)(ii) of this subdivision.
(xiv) Ozone	Log credit based on measured CT in relation to CT table. Specific criteria are in subparagraph (F)(ii) of this subdivision.
(xv) UV	Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operation conditions. Specific criteria are in subparagraph (F)(iii) of this subdivision.

(B) Source protection and management toolbox options for meeting Cryptosporidium treatment requirements.

(i) Watershed control program. A Subpart H system that provided notification under 40 CFR 171.716(a)(1) may submit an application to the department requesting approval to receive a 0.5 log Cryptosporidium treatment credit for implementing a watershed control program. Such application shall include documentation demonstrating that the Subpart H system's watershed control program meets the requirements of this subparagraph, and shall be submitted in accordance with subsection (t) of this section.

(I) A Subpart H system serving fewer than 10,000 people shall submit to the department with the Subpart H system's application a proposed watershed control plan not later than 1 year before the applicable treatment compliance date in subdivision (13)(C) of this subsection. The Subpart H system shall not receive the watershed control program treatment credit unless the department has approved the Subpart H system's application requesting approval to receive a 0.5 log Cryptosporidium treatment credit for implementing a watershed control program. The Subpart H system's watershed control program shall include the following elements in subclauses (I)(1) through (4), inclusive, of this clause:

(1) 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 subclause (III)(2) of this clause.

(2) Identification of both potential and actual sources of Cryptosporidium contamination and an assessment of the relative impact of these sources on the source water quality of the

Subpart H system.

(3) An analysis of the effectiveness and feasibility of control measures that could reduce Cryptosporidium loading from sources of contamination to the source water of the Subpart H system.

(4) A statement of goals and specific actions the Subpart H system will undertake to reduce source water Cryptosporidium levels. The plan shall 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.

(II) A Subpart H system with a watershed control program that was in place before January 5, 2006 is eligible to apply to the department for approval to receive the 0.5 log Cryptosporidium treatment credit for implementing a watershed control program. To obtain approval from the department to receive such credit, the Subpart H system shall submit to the department an application requesting approval of its watershed control program that was in place before January 5, 2006. Such application shall include documentation demonstrating that such watershed control plan meets the criteria in subclause (I) of this clause, and shall specify ongoing and future actions that will reduce source water Cryptosporidium levels. Such application shall be submitted in accordance with subsection (t) of this section.

(III) A Subpart H system shall complete the actions in subclauses (III)(1) through (3), inclusive, of this clause to maintain the 0.5 log credit:

(1) Submit annually to the department the Subpart H system's watershed control program status report for department review and approval in accordance with subsection (t) of this section. The annual watershed control program status report shall describe the implementation by the Subpart H system of the department-approved watershed control plan and assess the adequacy of the plan to meet the plan's goals. The Subpart H system's annual watershed control program status report shall also explain how the Subpart H system is addressing any shortcomings in its implementation of the department-approved watershed control plan, including those shortcomings previously identified by the department or as the result of the watershed survey conducted under subclause (III)(2) of this clause. In addition, the Subpart H system's annual watershed control program status report shall describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a Subpart H system determines during implementation of the Subpart H system's department-approved watershed control plan that making a significant change to its watershed control program is necessary, the Subpart H system shall submit an application to the department requesting approval to make such changes prior to making any changes. If any change is likely to reduce the level of source water protection, the Subpart H system shall also list in the Subpart H system's application the actions it will take to mitigate this effect.

(2) Undergo a watershed sanitary survey every year for CWSs and non-community water systems that are Subpart H systems. In conducting such survey, the CWS or non-community water system that is a Subpart H system shall determine whether it is in compliance with the requirements in section 19-13-B32 of the Regulations of Connecticut State Agencies. The CWS or non-community water system that is a Subpart H system shall submit its survey

to the department for review and approval in accordance with subsection (t) of this section. The CWS or non-community water system that is a Subpart H system shall include with its survey information, including, but not limited to, whether the CWS or non-community water system that is a Subpart H system is in compliance with the requirements in section 19-13-B32 of the Regulations of Connecticut State Agencies. The survey shall be conducted by a person whom the department has determined is competent to conduct such survey. The CWS or non-community water system that is a Subpart H system shall obtain department approval of the person prior to the person conducting such survey. To obtain such approval, the CWS or non-community water system that is a Subpart H system shall submit an application to the department requesting approval of the person conducting its survey in accordance with subsection (t) of this section. The survey of the CWS or non-community water system that is a Subpart H system conducted under subclause (III)(2) of this clause may be used by it to satisfy the survey or a portion of the survey required to be submitted to the department under subsection (b) of this section.

(A) In order to receive department approval, the watershed sanitary survey shall meet the following criteria: encompass the region identified in the department-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 potential and actual sources of Cryptosporidium.

(B) If, in reviewing the watershed sanitary survey of the CWS or non-community water system that is a Subpart H system, the department determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, the CWS or non-community water system that is a Subpart H system shall undergo another watershed sanitary survey by a date the department requires, which may be earlier than the regular watershed sanitary survey date in subclause (III)(2) of this clause.

(3) The CWS or non-community water system that is a Subpart H system shall make the department-approved watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents shall be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. If a CWS or non-community water system that is a Subpart H system, other than a CWS or non-community water system that is a Subpart H system owned by the state or a municipality, wants to withhold from the public portions of the department-approved annual status report, watershed control plan, or watershed sanitary survey reports based on water supply security considerations, it shall submit an application to the department requesting approval to do so. If the CWS or non-community water system that is a Subpart H system is owned or operated by the state or a municipality, the CWS or non-community water system that is a Subpart H system may withhold all or portions of the department-approved annual status report, watershed control plan, or watershed sanitary survey reports as permitted under sections 1-200 through 1-242, inclusive, of the Connecticut General Statutes. Such application shall include the reason or reasons of the CWS or non-community water system that is a Subpart H system for requesting to withhold such portions and shall be submitted in accordance with subsection (t) of this section.

(IV) If the department determines that a Subpart H system is not carrying out the approved watershed control plan, the department may withdraw the watershed control

program treatment credit.

(ii) Alternative source/intake management.

(I) A Subpart H system seeking to 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) shall submit an application to the department requesting approval to do so. Such application shall include the reason or reasons for requesting to conduct source water monitoring that reflects a different intake location or a different procedure for the timing or level of withdrawal from the source and shall be submitted in accordance with subsection (t) of this section. If the department approves the application of the Subpart H system, the Subpart H system may determine its bin classification under subparagraph (A) of this subdivision based on the alternative source monitoring results.

(II) If a Subpart H system conducts alternative source monitoring approved by the department under subclause (I) of this clause, the Subpart H system shall also monitor its current plant intake concurrently as described in subsection (e)(7)(T)(ii) of this section.

(III) To be approved by the department under subclause (I) of this clause, the alternative source monitoring shall meet the requirements for source monitoring to determine bin classification, as described subsections (e)(7)(T)(ii) through (e)(7)(T)(vi), inclusive, and (h)(9) of this section. A Subpart H system shall report the alternative source monitoring results in writing to the department, along with supporting information documenting the operating conditions under which the samples were collected.

(IV) If a Subpart H system determines its bin classification under subparagraph (A) of this subdivision 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 that was approved by the department, the Subpart H system shall relocate the intake or permanently adopt the withdrawal procedure, as applicable, not later than the applicable treatment compliance date in subdivision (12)(C) of this subsection.

(C) Pre-filtration treatment toolbox options.

(i) Presedimentation. A Subpart H system that has a presedimentation basin may submit an application to the department requesting approval to receive a 0.5 log Cryptosporidium treatment credit for the presedimentation basin during any month the process meets the criteria in subclauses (I) through (III), inclusive, of this clause. Such application shall include documentation demonstrating that the process meets the criteria in subclauses (I) through (III), inclusive, of this clause, and shall be submitted in accordance with subsection (t) of this section.

(I) The presedimentation basin shall be in continuous operation and shall treat the entire plant flow taken from a surface water or GWUDI source.

(II) The Subpart H system shall continuously add a coagulant to the presedimentation basin.

(III) The presedimentation basin shall achieve the performance criteria in subclause (III)(1) or (2) of this clause.

(1) Demonstrate at least 0.5 log mean reduction of influent turbidity. This reduction shall be determined using daily turbidity measurements in the presedimentation process influent and effluent and shall be calculated as follows: log10 (monthly mean of daily

influent turbidity) - log10 (monthly mean of daily effluent turbidity).

(2) The presedimentation basin shall comply with department-approved performance criteria that demonstrate at least 0.5 log mean removal of micron-sized particulate material through the presedimentation process. In order for the performance criteria to be department-approved, a Subpart H system shall submit an application to the department requesting approval of the performance criteria to demonstrate at least 0.5 log mean removal of micron-sized particulate material through the presedimentation process and receive department approval of such application. Such application shall be submitted in accordance with subsection (t) of this section.

(ii) Two-stage lime softening. A Subpart H system that has a two-stage lime softening plant may submit an application to the department requesting approval to receive a 0.5 log Cryptosporidium treatment credit for the two-stage lime softening plant. Such application shall include documentation demonstrating that the chemical addition and hardness precipitation occur in 2 separate and sequential softening stages prior to filtration, and shall be submitted in accordance with subsection (t) of this section. Both softening stages shall treat the entire plant flow taken from a surface water or GWUDI source.

(iii) Bank filtration. A Subpart H system that uses bank filtration that serves as pretreatment to a filtration plant may submit an application to the department requesting approval to receive a Cryptosporidium treatment credit for the bank filtration. Such application shall include documentation demonstrating that the bank filtration of the Subpart H system meets the criteria in subclauses (I) through (VII), inclusive, of this clause, and shall be submitted in accordance with subsection (t) of this section. A Subpart H system using bank filtration when it began source water monitoring under 40 CFR 141.701(a) shall collect samples as described in subsection (e)(7)(T)(iv)(IV) of this section and is not eligible for this credit.

(I) The wells of a Subpart H system with a ground water flow path of at least 25 feet are eligible to receive a 0.5 log treatment credit; the wells of a Subpart H system with a ground water flow path of at least 50 feet are eligible to receive a 1.0 log treatment credit. The ground water flow path shall be determined as specified in subclause (IV) of this clause.

(II) Only the wells of a Subpart H system in granular aquifers are eligible to receive a treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A Subpart H system shall characterize in the Subpart H system's application the aquifer at the well site to determine aquifer properties. To do so, the Subpart H system shall 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.

(III) Only the horizontal and vertical wells of a Subpart H system are eligible to receive a treatment credit.

(IV) 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.

(V) A Subpart H system shall monitor each wellhead for turbidity at least once every 4 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 Subpart H system shall report this result to the department in writing pursuant to subsection (h)(6)(B)(iii) of this section and shall conduct an assessment not later than 30 days after such exceedance to determine the cause of the high turbidity levels in the well. If the department determines that microbial removal has been compromised, the department may revoke the department's approval of the treatment credit until the Subpart H system implements corrective actions approved by the department to remediate the problem. A Subpart H system seeking approval of a corrective action shall submit an application to the department requesting approval of such corrective actions in accordance with subsection (t) of this section. The Subpart H system shall not implement a corrective action unless the corrective action is approved by the department.

(VI) Springs and infiltration galleries are not eligible for treatment credit under this subparagraph.

(VII) Bank filtration demonstration of performance. A Subpart H system that uses bank filtration may submit an application to the department requesting approval to receive a Cryptosporidium treatment credit for the bank filtration if its demonstration of performance study meets the criteria in subclauses (VII)(1) and (2) of this clause. Such application shall include documentation demonstrating that the Subpart H system's demonstration of performance study meets the requirements of subclauses (VII)(1) and (2) of this clause, and shall be submitted in accordance with subsection (t) of this section. The treatment credit, if approved by the department, may be greater than 1.0 log and may be approved by the department for bank filtration that does not meet the criteria in subclauses (I) through (V), inclusive, of this clause.

(1) The study shall follow a department-approved protocol and shall 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. To request approval of the protocol of the Subpart H system, the Subpart H system shall submit an application to the department in accordance with subsection (t) of this section. The study shall not follow such protocol unless the protocol is approved by the department.

(2) The study shall 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).

(D) Treatment performance toolbox options.

(i) Combined filter performance. A Subpart H system that uses conventional filtration treatment or direct filtration treatment may submit an application to the department in accordance with subsection (t) of this section requesting approval to receive an additional 0.5 log Cryptosporidium treatment credit during any month the combined filter effluent (CFE) turbidity of the Subpart H system is less than or equal to 0.15 NTU in at least 95 percent of the measurements. Such application shall include documentation demonstrating that the CFE turbidity of the Subpart H system is less than or equal to 0.15 NTU in at least 95 percent of the measurement. Turbidity shall be measured as described in 40 CFR

141.74(a) and (c), as amended from time to time.

(ii) Individual filter performance. A Subpart H system that uses conventional filtration treatment or direct filtration treatment may submit an application to the department requesting approval to receive 0.5 log Cryptosporidium treatment credit, which can be in addition to the 0.5 log credit under clause (i) of this subparagraph, during any month the Subpart H system meets the criteria in subclauses (I) through (III), inclusive, of this clause. Such application shall include documentation demonstrating that the Subpart H system met the criteria in subclauses (I) through (III), inclusive, of this clause and shall be submitted in accordance with subsection (t) of this section. Compliance with the criteria in subclauses (I) through (III), inclusive, of this clause shall be based on individual filter turbidity monitoring as described in subsection (e)(7)(S)(i) of this section.

(I) The filtered water turbidity for each individual filter shall be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

(II) No individual filter may have a measured turbidity greater than 0.3 NTU in 2 consecutive measurements taken 15 minutes apart.

(III) Any Subpart H system that has received a treatment credit for individual filter performance and fails to meet the requirements in subclause (I) or (II) of this clause during any month may submit an application to the department requesting that the department grant the Subpart H system a waiver from such requirements and not find the Subpart H system in violation of the treatment technique requirements pursuant to subdivision (12)(B)(iv) of this subsection. Such application shall include documentation demonstrating that the Subpart H system has satisfied the criteria in subclauses (III)(1) and (2) of this clause and shall be submitted in accordance with subsection (t) of this section. The department may issue such waiver if the department determines that:

(1) The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance; and

(2) The Subpart H system has experienced no more than 2 such failures in any calendar year.

(E) Additional filtration toolbox options.

(i) Bag and cartridge filters. A Subpart H system that uses individual bag or cartridge filters or bag or cartridge filters operated in series may submit an application to the department requesting approval to receive a Cryptosporidium treatment credit of up to 2 log and up to 2.5 log, respectively. To be eligible for this credit, the bag and cartridge filters of the Subpart H system shall meet the criteria in subclauses (I) through (X), inclusive, of this clause. The Subpart H system shall submit an application to the department in accordance with subsection (t) of this section and shall include with the application documentation demonstrating that the results of challenge testing meet the requirements of subclauses (II) through (IX), inclusive, of this clause, the filters treat the entire plant flow taken from a surface water or GWUDI source, or both, and the bag and cartridge filters of the Subpart H system meet the following criteria:

(I) The department-approved Cryptosporidium treatment credit awarded to bag or cartridge filters shall be based on the removal efficiency demonstrated during challenge testing that is conducted according to the criteria in subclauses (II) through (IX), inclusive,

of this clause. 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 shall be applied to challenge testing results to determine removal credit. A Subpart H system that conducted challenge testing prior to January 5, 2006 may submit an application to the department requesting approval to use the results from such challenge testing. Such application shall include documentation demonstrating that the prior testing was consistent with the criteria specified in subclauses (II) through (IX), inclusive, of this clause, and shall be submitted in accordance with subsection (t) of this section. The department shall only approve the use of such results if the prior testing was consistent with the criteria specified in subclauses (II) through (IX), inclusive, of this clause.

(II) Challenge testing shall 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 Subpart H system will use for removal of Cryptosporidium. Bag or cartridge filters shall be challenge tested in the same configuration that the Subpart H system will use, either as individual filters or as a series configuration of filters.

(III) Challenge testing shall 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 shall be determined using a method capable of discreetly quantifying the specific microorganism or surrogate used in the test. Gross measurements such as turbidity shall not be used.

(IV) The maximum feed water concentration that can be used during a challenge test shall be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and shall be calculated using the following equation: Maximum Feed Concentration = 1 x 104 x (Filtrate Detection Limit).

(V) Challenge testing shall be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(VI) Each filter evaluated shall 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 subdivision, subdivision (12) of this subsection and subsections (e)(7)(T), (h)(9), and (i)(5) of this section.

(VII) Removal efficiency of a filter shall be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

LRV = LOG10(Cf) - LOG10(Cp)

Where:

LRV = log removal value demonstrated during challenge testing; Cf = the feed concentration measured during the challenge test; and Cp = the filtrate concentration measured during the challenge test. In applying this equation, the same units shall be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, then the term Cp shall be set equal to the detection limit.

(VIII) Each filter tested shall be challenged with the challenge particulate during 3 periods over the filtration cycle: not later than 2 hours after start-up of a new filter; when the pressure drop is between 45 percent 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 shall be calculated for each of these challenge periods for each filter tested. The LRV for the filter (LRVfilter) shall be assigned the value of the minimum LRV observed during the 3 challenge periods for that filter.

(IX) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line shall be set equal to the lowest LRVfilter among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line shall be set equal to the 10th percentile of the set of LRVfilter 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.

(X) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, the Subpart H system shall conduct challenge testing to demonstrate the removal efficiency of the modified filter and shall submit an application to the department requesting approval of such modified filter. Such application shall include the reason or reasons for such request, including the results of the challenge testing, and shall be submitted in accordance with subsection (t) of this section.

(ii) Membrane filtration.

(I) A Subpart H system that uses membrane filtration that meets the criteria in this clause and the definition of membrane filtration in subsection (a) of this section may submit an application to the department requesting approval to receive a Cryptosporidium treatment credit. Such application shall include documentation demonstrating that the membrane filtration meets the criteria specified in this clause and the definition of membrane filtration in subsection (a) of this section, and shall be submitted in accordance with subsection (t) of this section. The level of treatment credit the department approves is equal to the lower of the values determined under this subclause (I)(1) and (2) of this clause.

(1) The removal efficiency demonstrated during challenge testing conducted under the conditions in subclause (II) of this clause.

(2) The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process in subclause (III) of this clause.

(II) Challenge testing. The membrane used by the Subpart H system shall undergo challenge testing to evaluate removal efficiency, and the Subpart H system shall report the results of challenge testing to the department for review and approval in accordance with subsection (t) of this section. Challenge testing shall be conducted according to the criteria in subclauses (II)(1) through (7), inclusive, of this clause. A Subpart H system that conducted challenge testing prior to January 5, 2006 may submit the results from such challenge testing to the department for review and approval in accordance with subsection (t) of this section. The Subpart H system shall include with the results of its challenge testing that occurred prior to January 5, 2006, documentation demonstrating that the prior testing was consistent with the criteria specified in subclauses (II)(1) through (7), inclusive, of this clause. The department shall only approve the use of such results if the prior testing was consistent with the criteria specified in subclauses (II)(1) through (7), inclusive, of this clause.

(1) Challenge testing shall be conducted on either a full-scale membrane module that is identical in material and construction to the membrane modules used in the treatment facility of the Subpart H system or a smaller-scale membrane module that is 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.

(2) Challenge testing shall 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, shall be determined using a method capable of discretely quantifying the specific challenge particulate used in the test. Gross measurements such as turbidity shall not be used.

(3) 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 shall be determined according to the following equation: Maximum Feed Concentration = 3.16 x 106 x (Filtrate Detection Limit).

(4) Challenge testing shall 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).

(5) Removal efficiency of a membrane module shall be calculated from the challenge test results and expressed as a log removal value according to the following equation:

LRV = LOG10(Cf) x LOG10(Cp)

Where:

LRV = log removal value demonstrated during the challenge test; Cf = the feed concentration measured during the challenge test; and Cp = the filtrate concentration measured during the challenge test. Equivalent units shall be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term Cp is set equal to the detection limit for the purpose of calculating the LRV. An LRV shall be calculated for each membrane module evaluated during the challenge test.

(6) The removal efficiency of a membrane filtration process demonstrated during challenge testing shall 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.

(7) The challenge test shall 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 shall be applied to each production membrane module used by the Subpart H 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.

(8) 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 shall be conducted. The Subpart H system shall submit an application to the department in accordance with subsection (t) of this section requesting approval of the modified membrane.

(III) Direct integrity testing. Subpart H systems shall conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit approved by the department for the membrane filtration process and shall meet the requirements described in subclauses (III)(1) through (6), inclusive, of this clause.

(1) The direct integrity test shall 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 Subpart H system for the purpose of integrity testing or other maintenance.

(2) The direct integrity method shall 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.

(3) The direct integrity test shall have a sensitivity sufficient to verify the log treatment credit approved by the department for the membrane filtration process of Subpart H system where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity shall be determined using the approach in either subclause (III)(3)(A) or (B) of this clause that is applicable to the type of direct integrity test the Subpart H system uses:

(A) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity shall be calculated according to the following equation:

LRVDIT = LOG10(Qp /(VCF x Qbreach))

Where:

LRVDIT = the sensitivity of the direct integrity test; Qp = total design filtrate flow from the membrane unit; Qbreach = 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.

(B) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity shall be calculated according to the following equation:

LRVDIT = LOG10(Cf) - LOG10(Cp)

Where:

LRVDIT = the sensitivity of the direct integrity test; Cf = the typical feed concentration of the marker used in the test; and Cp = the filtrate concentration of the marker from an integral membrane unit.

(4) Subpart H systems shall 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 approved by the department.

(5) If the result of a direct integrity test exceeds the control limit established under subclause (III)(4) of this clause, the Subpart H system shall remove the membrane unit from

service. Subpart H systems shall 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.

(6) Subpart H systems shall 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 Subpart H system may submit an application to the department requesting approval to conduct less frequent testing. Such application shall include documentation of demonstrated process reliability, the use of multiple barriers effective for Cryptosporidium or reliable process safeguards, and shall be submitted in accordance with subsection (t) of this section.

(IV) Indirect integrity monitoring. Subpart H systems shall conduct continuous indirect integrity monitoring on each membrane unit according to the criteria in subclauses (IV)(1) through (5), inclusive, of this clause. Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A Subpart H system that implements continuous direct integrity testing of membrane units in accordance with the criteria in subclauses (III)(1) through (5), inclusive, of this clause is not subject to the requirements for continuous indirect integrity monitoring. Subpart H systems shall submit a monthly report to the department for department approval summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case. Such report shall be submitted in accordance with subsection (t) of this section.

(1)Unless the department approves an alternative parameter, continuous indirect integrity monitoring shall include continuous filtrate turbidity monitoring. A Subpart H system seeking to use an alternative parameter shall submit an application to the department requesting such approval in accordance with subsection (t) of this section. The Subpart H system shall not use an alternative parameter unless the alternative parameter is approved by the department.

(2) Continuous monitoring shall be conducted at a frequency of not less than once every 15 minutes.

(3) Continuous monitoring shall be separately conducted on each membrane unit.

(4) 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., 2 consecutive 15-minute readings above 0.15 NTU), direct integrity testing shall immediately be performed on the associated membrane unit as specified in subclauses (III)(1) through (5), inclusive, of this clause.

(5) If indirect integrity monitoring includes a department-approved alternative parameter and if the alternative parameter exceeds a department-approved control limit for a period greater than 15 minutes, direct integrity testing shall immediately be performed on the associated membrane units as specified in subclauses (III)(1) through (5), inclusive, of this clause.

(iii) Second stage filtration. A Subpart H system that uses a separate second stage of filtration that consists of rapid sand, dual media, granular activated carbon, or other fine grain media following granular media filtration may submit an application to the department requesting approval to receive a 0.5 log Cryptosporidium treatment credit. Such application shall include documentation demonstrating that the first stage of filtration is preceded by a

coagulation step and that both filtration stages treat the entire plant flow from a surface water or GWUDI source, and shall be submitted in accordance with subsection (t) of this section. A Subpart H system is not eligible for this credit if it uses a cap, such as granular activated carbon, on the single stage of filtration. In determining whether to approve the application, the department shall conduct an assessment of the design characteristics of the filtration process.

(iv) Slow sand filtration as secondary filter. A Subpart H system that uses a slow sand filtration process that follows a separate stage of filtration and 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 may submit an application to the department requesting approval to receive a 2.5 log Cryptosporidium treatment credit. Such application shall include the reason or reasons for such request and shall be submitted in accordance with subsection (t) of this section. In determining whether or not to approve the application, the department shall assess the design characteristics of the filtration process. This clause does not apply to a treatment credit approved by the department for slow sand filtration used as a primary filtration process.

(F) Inactivation toolbox components.

(i) Calculation of CT values for chlorine dioxide and ozone.

(I) Subpart H systems with a department-approved treatment credit for chlorine dioxide or ozone under clause (ii) or (iii) of this subparagraph shall calculate CT at least once each day, as specified in 40 CFR 141.74(a) through (b), as amended from time to time.

(II) Subpart H 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, Subpart H systems shall add the Cryptosporidium CT values in each segment to determine the total CT for the treatment plant.

(ii) CT values for chlorine dioxide and ozone.

(I) A Subpart H system that uses chlorine dioxide that meets the chlorine dioxide CT values for the applicable water temperature, as described in clause (i) of this subparagraph, may submit an application to the department requesting approval to receive the corresponding Cryptosporidium treatment credit listed in Table 13-F1 of this subclause. Such application shall be submitted in accordance with subsection (t) of this section.

TABLE 13-F1. CT VALUES (mg-min/l) FOR CRYPTOSPORIDIUM INACTIVATION BY CHLORINE DIOXIDE.[1]

LOG CREDIT	**WATER TEMPERATURE (DEGREES IN CELSIUS)**										
	< 0.5	1	2	3	5	7	10	15	20	25	30
0.25	159	153	140	128	107	90	69	45	29	19	12
0.5	319	305	279	256	214	180	138	89	58	38	24
1.0	637	610	558	511	429	360	277	179	116	75	49
1.5	956	915	838	767	643	539	415	268	174	113	73
2.0	1275	1220	1117	1023	858	719	553	357	232	150	98
2.5	1594	1525	1396	1278	1072	899	691	447	289	188	122

3.0	1912	1830	1675	1534	1286	1079	830	536	347	226	147

[1] Subpart H systems may use this equation to determine log credit between the indicated values: Log credit = (0.001506 x (1.09116) Temp) x CT.

(II) A Subpart H system that uses ozone that meets the ozone CT values for the applicable water temperature, as described in clause (i) of this subparagraph, may submit an application to the department requesting approval to receive the corresponding Cryptosporidium treatment credit listed in Table 13-F2 of this subclause. Such application shall be submitted in accordance with subsection (t) of this section.

TABLE 13-F2. CT VALUES (mg-min/l) FOR CRYPTOSPORIDIUM INACTIVATION BY OZONE[1]

LOG CREDIT	**WATER TEMPERATURE (DEGREES IN CELSIUS)**										
	< 0.5	1	2	3	5	7	10	15	20	25	30
0.25	6.0	5.8	5.2	4.8	4.0	3.3	2.5	1.6	1.0	0.6	0.39
0.5	12	12	10	9.5	7.9	6.5	4.9	3.1	2.0	1.2	0.78
1.0	24	23	21	19	16	13	9.9	6.2	3.9	2.5	1.6
1.5	36	35	31	29	24	20	15	9.3	5.9	3.7	2.4
2.0	48	46	42	38	32	26	20	12	7.8	4.9	3.1
2.5	60	58	52	48	40	33	25	16	9.8	6.2	3.9
3.0	72	69	63	57	47	39	30	19	12	7.4	4.7

[1] Subpart H systems may use this equation to determine log credit between the indicated values: Log credit = (0.0397 x (1.09757) Temp) x CT.

(iii) Ultraviolet (UV). A Subpart H system that uses UV light reactors may submit an application to the department requesting approval to receive a Cryptosporidium, Giardia lamblia and virus treatment credits. Such application shall include documentation demonstrating that the Subpart H system is achieving the corresponding UV dose values shown in subclause (I) of this clause, and shall be submitted in accordance with subsection (t) of this section. Subpart H systems shall also include documentation demonstrating that the Subpart H system is achieving a particular UV dose value for treatment credit based on its validation and monitoring of its UV reactors as described in subclauses (II) and (III) of this clause.

(I) UV dose table. The treatment credits listed in Table 13-F3 of this subclause are for UV light at a wavelength of 254 nm as produced by a low pressure mercury vapor lamp. To obtain department approval to receive treatment credit for other lamp types, Subpart H systems shall demonstrate in the application submitted to the department an equivalent germicidal dose through reactor validation testing, as described in subclause (II) of this clause. The UV dose values in Table 13-F3 of this subclause are only applicable to post-filter applications in Subpart H systems.

TABLE 13-F3. UV DOSE TABLE FOR CRYPTOSPORIDIUM, GIARDIA LAMBLIA, AND VIRUS INACTIVATION CREDIT

LOG CREDIT	**CRYPTOSPORID**	**GIARDIA LAM**	**VIRUS**

	IUM UV DOSE (MJ/CM^2)	BLIA UV DOSE (MJ/CM^2)	UV DOSE (MJ/CM^2)
0.5	1.6	1.5	39
1.0	2.5	2.1	58
1.5	3.9	3.0	79
2.0	5.8	5.2	100
2.5	8.5	7.7	121
3.0	12	11	143
3.5	15	15	163
4.0	22	22	186

(II) Reactor validation testing. Subpart H systems shall use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the UV dose required in subclause (I) of this clause (i.e., validating operating conditions). These operating conditions shall include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

(1) When determining validated operating conditions, Subpart H systems shall 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.

(2) Validation testing shall include the following: Full scale testing of a reactor that conforms uniformly to the UV reactors used by the Subpart H system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

(III) Reactor monitoring.

(1) A Subpart H system shall monitor its UV reactors to determine if the reactors are operating within validated conditions, as determined under subclause (II) of this clause. This monitoring shall include UV intensity as measured by a UV sensor, flow rate, lamp status, and any other parameters identified by the department as necessary to determine if the UV reactors of the Subpart H system are operating within validated conditions. Subpart H systems shall verify the calibration of UV sensors and shall recalibrate sensors in accordance with a protocol the department approves. To request approval of a protocol, the Subpart H system shall submit an application to the department requesting approval of its protocol in accordance with subsection (t) of this section.

(2) To receive treatment credit for UV light, Subpart H systems shall 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 subclauses (I) and (II) of this clause. Subpart H systems shall demonstrate compliance with this condition by the monitoring required under this subclause (III)(1) of this clause.

(14) Corrective action treatment techniques.

(A) The treatment technique requirements in this subdivision shall be met by ground water systems when a ground water source sample or samples collected under subsection

(e)(12)(C)(iii) of this section is fecal indicator-positive. In addition, the treatment technique requirements of this subdivision shall be met by ground water systems when a ground water source sample collected under subsection (e)(12)(C)(ii) or (e)(12)(C)(iv) of this section is fecal indicator-positive, if the department determines that such ground water system shall meet such requirements.

(i) Corrective action alternatives. A ground water system that has a ground water source sample or samples collected under subsection (e)(12)(C)(iii) of this section that is fecal indicator-positive shall implement 1 or more of the corrective actions in subclauses (I) through (IV), inclusive, of this clause. In addition, if the department determines that a ground water system that has a ground water source sample or samples collected under subsection (e)(12)(C)(ii) or (e)(12)(C)(iv) of this section that is fecal indicator-positive shall implement a corrective action, then the ground water system shall implement 1 or more of the corrective actions in subclauses (I) through (IV), inclusive, of this clause:

(I) Correct all significant deficiencies;

(II) Provide an alternate source of water;

(III) Eliminate the source of contamination; or

(IV) Provide treatment that reliably achieves at least 4 log (99.99 percent) treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the ground water source.

(ii) Unless the department directs the ground water system to implement a specific corrective action, the ground water system shall consult with the department regarding the appropriate corrective action not later than 30 days after receiving written notice from a laboratory that a ground water source sample or samples collected under subsection (e)(12)(C)(iii) of this section was found to be fecal indicator-positive or direction in writing from the department that a fecal indicator-positive sample collected under subsection (e)(12)(C)(ii) or (e)(12)(C)(iv) of this section requires corrective action.

(iii) Not later than 60 days after receiving direction in writing from the department regarding implementation of a specific corrective action, written notice from the laboratory regarding a fecal indicator-positive sample or samples, collected under subsection (e)(12)(C)(iii) of this section, or direction in writing from the department that a fecal indicator-positive sample, collected under subsection (e)(12)(C)(ii) or (e)(12)(C)(iv) of this section, requires corrective action, the ground water system shall submit an application to the department requesting approval of the corrective action that the ground water system will take to address the fecal indicator-positive sample or samples, and include a proposed schedule for completing that action. Such application shall be submitted in accordance with subsection (t) of this section. If the department approves such application, such application shall constitute the department-approved corrective action plan as referenced in clause (iv) of this subparagraph.

(iv) Not later than 120 days (or earlier if directed by the department) after receiving direction in writing from the department regarding implementation of a specific corrective action, written notice from the laboratory regarding a fecal indicator-positive sample or samples, collected under subsection (e)(12)(C)(iii) of this section, or direction in writing from the department that a fecal indicator-positive sample, collected under subsection (e)(12)(C)(ii) or (e)(12)(C)(iv) of this section, requires corrective action, the ground water

system shall either:

(I) Have completed corrective action in accordance with the department-approved corrective action plan and schedule, including department-specified interim measures, if any; or

(II) Be in compliance with a department-approved corrective action plan and schedule, subject to the conditions specified in subclause (II)(1) and (2), inclusive, of this clause.

(1) Any subsequent modifications to a department-approved corrective action plan and schedule shall also be approved by the department. The ground water system shall submit an application to the department requesting approval of the subsequent modifications to a department-approved corrective action plan and schedule in accordance with subsection (t) of this section.

(2) If the department requires the ground water system to implement specific interim measures for protection of public health pending department approval of the corrective action plan and schedule or pending completion of the corrective action plan, the ground water system shall comply with these interim measures as well as any schedule specified by the department. For purposes of this subdivision, interim measures include, but are not limited to, the following:

(A) Provision of an alternate source of water;

(B) Notice to consumers to boil all water to be used for consumption;

(C) Temporary disinfection of water in a manner prescribed by the department; and

(D) Inactivation of a water source or sources.

(B) Compliance monitoring.

(i) Existing ground water sources.

(I) A ground water system seeking approval from the department that the ground water system is not subject to the source water monitoring requirements of subsection (e)(12) of this section because the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a specified ground water source or sources shall submit to the department an application requesting such approval. Such application shall include documentation demonstrating that the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a specified ground water source or sources, including, but not limited to, engineering, operational, or other information that the department may require to enable the department to evaluate the ground water system's 4 log treatment of viruses, and shall be submitted in accordance with subsection (t) of this section. If the department approves the ground water system's application, the ground water system shall begin compliance monitoring of the specified ground water source or sources in accordance with clause (iii) of this subparagraph. The department's approval shall state the required minimum RDC, or the required minimum RDC and the required minimum CT value, that the ground water system shall maintain every day the ground water system serves water from the ground water source to the public. If a ground water system maintains the RDC at or above the ground water system's required minimum RDC, no CT value calculation is required. If a ground water system fails to maintain the RDC at or above the ground water system's required minimum

RDC, the ground water system may submit an application to the department under clause (iii)(I)(1) or (2) of this subparagraph requesting a determination as to whether the ground water system is providing at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal.

(II) The department may require a ground water system that subsequently discontinues the department-approved 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the specified ground water source to conduct assessment source water monitoring under subsection (e)(12)(D)(ii) of this section. A ground water system that discontinues 4 log treatment of viruses shall comply with the source water monitoring requirements in subsection (e)(12)(C) of this section and analytical methods requirements in subsection (e)(12)(E) of this section.

(ii) New ground water sources. A ground water system that places a new ground water source in service that is not subject to the source water monitoring requirements of subsection (e)(12) of this section because the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the ground water source shall comply with the following requirements:

(I) The ground water system shall submit an application to the department requesting approval from the department that the ground water system is not subject to the source water monitoring requirements of subsection (e)(12) of this section because the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for the specified ground water source. Such application shall include documentation demonstrating that the ground water system provides at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a specified ground water source or sources, including, but not limited to, engineering, operational, or other information that the department may require to enable the department to evaluate the ground water system's 4 log treatment of viruses, and shall be submitted in accordance with subsection (t) of this section. The department's approval shall state the required minimum RDC, or the required minimum RDC and required minimum CT value, the ground water system shall maintain every day the ground water system serves water from the ground water source to the public. If a ground water system maintains the RDC at or above the ground water system's required minimum RDC, no CT value calculation is required. If a ground water system fails to maintain the RDC at or above the ground water system's required minimum RDC, the ground water system may submit an application to the department pursuant to clause (iii)(I)(1) or (2) of this subparagraph requesting a determination as to whether the ground water system is providing at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal.

(II) If the department approves the ground water system's application submitted under subclause (I) of this clause, the ground water system shall conduct compliance monitoring in accordance with clause (iii) of this subparagraph not later than 30 days after placing the ground water source in service.

(III) The department may require a ground water system that subsequently discontinues the department-approved 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source to conduct assessment source water monitoring under subsection (e)(12)(D)(ii) of this section. A ground water system that discontinues 4 log treatment of viruses is subject to the triggered source water monitoring requirements of subsection (e)(12)(C) of this section and analytical methods requirements in subsection (e)(12)(E) of this section.

(iii) Monitoring requirements. A ground water system subject to the requirements of subparagraph (A) of this subdivision, clause (i) or (ii) of this subparagraph or subsection (e)(7)(E)(iv)(II)(4) of this section shall monitor the effectiveness and reliability of treatment for such ground water source before or at the first consumer as follows in subclauses (I) through (III), inclusive, of this clause:

(I) Chemical disinfection.

(1) Ground water systems serving greater than 3,300 people. A ground water system that serves greater than 3,300 people shall submit an application to the department requesting approval of the location at which the ground water system will monitor the RDC and CT value, if the department has stated a required minimum CT value. Such application shall be submitted in accordance with subsection (t) of this section. The ground water system shall continuously monitor the RDC using analytical methods specified in 40 CFR 141.74(a)(2), as amended from time to time, at the location approved by the department and shall record the lowest RDC on each day that water from the ground water source is served to the public. If the lowest daily RDC is below the ground water system's required minimum RDC, but the ground water system's CT value is at or above the ground water system's required minimum CT value, the ground water system may submit an application to the department requesting a determination as to whether the ground water system is providing at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal. Such application shall include documentation demonstrating that the ground water system's lowest daily CT value is at or above the ground water system's required minimum CT value, and shall be submitted in accordance with subsection (t) of this section. If there is a failure in the continuous monitoring equipment, the ground water system shall conduct grab sampling every 4 hours until the continuous monitoring equipment is returned to service. The ground water system shall resume continuous RDC monitoring not later than 14 days after the failure of the continuous monitoring equipment.

(2) Ground water systems serving 3,300 or fewer people. A ground water system that serves 3,300 or fewer people shall submit an application to the department requesting approval of the location at which the ground water system will monitor the RDC and CT value, if the department has stated a required minimum CT value. Such application shall be submitted in accordance with subsection (t) of this section. The ground water system shall monitor the RDC using analytical methods specified in 40 CFR 141.74(a)(2), as amended from time to time, at the location approved by the department and shall record the lowest RDC on each day that water from the ground water source is served to the public. If any daily grab sample measurement falls below the ground water system's required

minimum RDC, the ground water system shall take follow-up samples every 4 hours until the RDC is restored to the required level. Alternatively, a ground water system that serves 3,300 or fewer people may monitor continuously and meet the requirements of subclause (I)(1) of this clause. If the lowest daily RDC is below the ground water system's required minimum RDC, but the ground water system's CT value is at or above the ground water system's required minimum CT value, the ground water system may submit an application to the department requesting a determination as to whether the ground water system is providing at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal. Such application shall include documentation demonstrating that the ground water system's lowest daily CT value is at or above the ground water system's required minimum CT value, and shall be submitted in accordance with subsection (t) of this section.

(II) Membrane filtration. A ground water system that uses membrane filtration to meet the requirements of this subdivision and subsections (e)(7)(E)(iv)(II)(4) and (e)(12) of this section shall monitor the membrane filtration process in accordance with all department-approved monitoring requirements and shall operate the membrane filtration in accordance with all department-approved compliance requirements. To request approval of the ground water system's monitoring and compliance requirements, a ground water system shall submit an application to the department requesting such approval in accordance with subsection (t) of this section. Such application shall include documentation demonstrating that the ground water system's monitoring and compliance requirements will measure the effectiveness of the membrane filtration and the membrane filtration process to achieve at least 4 log removal of viruses. A ground water system that uses membrane filtration is in compliance with the requirement to achieve at least 4 log removal of viruses when the membrane is in compliance with the following:

(1) The membrane has an absolute MWCO, or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4 log removal of viruses;

(2) The membrane process is operated in accordance with department-approved compliance requirements; and

(3) The integrity of the membrane is intact.

(III) Alternative treatment. To request approval of an alternative treatment to meet the requirements of this subdivision and subsections (e)(7)(E)(iv)(II)(4) and (e)(12) of this section by providing at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumers, a ground water system shall submit an application to the department requesting such approval in accordance with subsection (t) of this section. Such application shall include documentation demonstrating that the combination of inactivation and removal provides at least 4 log treatment of viruses before or at the first consumer. A ground water system that uses a department-approved alternative treatment shall comply with the following requirements:

(1) Monitor the alternative treatment in accordance with all department-approved monitoring requirements. To request approval of the ground water system's monitoring requirements, a ground water system shall submit an application to the department

requesting such approval in accordance with subsection (t) of this section. Such application shall include documentation demonstrating that the ground water system's monitoring requirements will measure the effectiveness of the department-approved combination of 4 log inactivation and removal to achieve at least 4 log removal of viruses; and

(2) Operate the alternative treatment in accordance with all department-approved compliance requirements. To request approval of the ground water system's compliance requirements, a ground water system shall submit an application to the department requesting such approval in accordance with subsection (t) of this section. Such application shall include documentation demonstrating that the ground water system's compliance requirements will maintain and measure the effectiveness of the department-approved combination of 4 log inactivation and removal to achieve at least 4 log treatment of viruses.

(C) Discontinuing treatment.

(i) A ground water system may discontinue a department-approved 4 log treatment of viruses using inactivation, removal, or a combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source if the ground water system satisfies 1 of the following criteria in subclauses (I) through (IV), inclusive, of this clause and the ground water system receives approval from the department to do so. A ground water system seeking such approval shall submit an application to the department requesting approval to discontinue the ground water system's department-approved 4 log treatment of viruses using inactivation, removal, or a combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source. Such application shall include documentation demonstrating that the department-approved 4 log treatment of viruses is no longer necessary for that ground water source because the ground water system satisfies at least 1 of the 4 criteria in subclauses (I) through (IV), inclusive, of this clause, and shall be submitted in accordance with subsection (t) of this section.

(I) The ground water system abandoned the ground water source for which the department-approved 4 log treatment was required;

(II) The ground water system removed the source or sources of contamination for which the department-approved 4 log treatment was required;

(III) The ground water system corrected the significant deficiency or deficiencies for which the department-approved 4 log treatment was required; or

(IV) Other reason why the department-approved 4 log treatment of viruses is no longer needed for the ground water source.

(ii) A ground water system that discontinues a department-approved 4 log treatment of viruses is subject to the triggered source water monitoring requirements of subsection (e)(12)(C) of this section and analytical methods requirements in subsection (e)(12)(E) of this section.

(iii) The department may require a ground water system that subsequently discontinues the department-approved 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source to conduct assessment source water monitoring under subsection (e)(12)(D)(ii) of this section.

(D) Failure to meet the monitoring requirements of subparagraph (B) of this subdivision is a monitoring violation and requires the ground water system to provide public notification

under subsection (i)(3) of this section.

(E) Treatment technique violations.

(i) Unless the department invalidates a fecal indicator-positive ground water source sample under subsection (e)(12)(F) of this section, a ground water system is in violation of the treatment technique requirement if, not later than 120 days (or earlier if required by the department) after meeting the conditions of subparagraph (A) of this subdivision, the ground water system:

(I) Does not complete corrective action in accordance with the department-approved corrective action plan and schedule, including department-specified interim measures, if any; or

(II) Is not in compliance with a department-approved corrective action plan and schedule.

(ii) A ground water system subject to the requirements of subparagraph (B)(iii) of this subdivision that fails to maintain at least 4 log treatment of viruses using inactivation, removal, or a department-approved combination of 4 log virus inactivation and removal before or at the first consumer for a ground water source is in violation of the treatment technique requirement if the failure is not corrected within 4 hours of determining the ground water system is not maintaining at least 4 log treatment of viruses before or at the first consumer.

(iii) Ground water systems shall give public notification under subsection (i)(2) of this section for the treatment technique violations specified in clauses (i) and (ii) of this subparagraph.

(k) **Variances and exemptions.** Variances and Exemptions from the MCL for total coliforms of subparagraph 19-13-B102 (e) (6) (B) of the Regulations of Connecticut State Agencies may be granted by the department for systems that demonstrate to the satisfaction of the department that the violation of the total coliform MCL is due to a persistent growth of total coliforms in the distribution system rather than fecal or pathogenic contamination, a treatment lapse or deficiency, or a problem in the operation or maintenance of the distribution system. The department shall use the following criteria to identify systems that could operate under a variance without posing an unreasonable risk to health:

(1) Over the past thirty (30) days, water entering the distribution system is shown to:

(A) Be free from fecal coliform or E.coli occurrence based on at least daily sampling;

(B) contain less than one (1) total coliform per hundred (100) milliliters of influent water in at least ninety five percent (95%) of all samples based on at least daily sampling;

(C) Comply with the total turbidity requirements of Section 19-13-B102 (j);

(D) Contain a continuous disinfection residual of at least 0.2 mg/l;

(2) The system has had no waterborne disease outbreak while operated in its present configuration;

(3) The system maintains biweekly contact with the department and local health departments to assess illness possibly attributable to microbial occurrence in the public drinking water system;

(4) The system has evaluated, on a monthly basis, at least the number of samples specified in Section 19-13-B102 (e) and has not had an E.coli-positive compliance sample within the last six months, unless the system demonstrates to the department that the occurrence is not due to contamination entering the distribution system;

(5) The system has undergone a sanitary survey conducted by a party approved by the department within the past twelve (12) months;

(6) The system has a cross connection control program acceptable to the department and performs an audit of the effectiveness program;

(7) The system agrees to submit a biofilm control plan to the department within twelve (12) months of the granting of the first request for a variance;

(8) The system monitors general distribution system bacterial quality by conducting heterotrophic bacteria plate counts on at least a weekly basis at a minimum of ten percent (10%) of the number of total coliform sites specified for that system size in Section 19-13-B102 (e); and

(9) The system conducts daily monitoring at distribution system sites approved by the department and maintains a detectable disinfectant residual at a minimum of ninety five percent (95%) of those points and a heterotrophic plate count of less than five hundred (500) colonies per ml at sites without a disinfectant residual.

(*l*) **Record maintenance.**

(1) Any owner of a system shall retain on its premises or at a convenient location near its premises the records described in subparagraphs (A) to (U) of this subdivision. All such records maintained by an owner of a system shall be available for inspection by the department immediately upon the request of the department:

(A) Records of all microbiological analyses and turbidity analyses made pursuant to this section shall be kept for not less than 5 years. Records of chemical analyses shall be kept for not less than 10 years. Actual laboratory reports may be kept, or data may be transferred to tabular summaries, provided the following information is included:

(i) The date, place and time of sampling, and the name of the person who collected the sample;

(ii) Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or processed water sample or other special purpose sample;

(iii) Date of analysis;

(iv) Laboratory and person responsible for performing analysis;

(v) The analytical technique/method used; and

(vi) The results of the analysis.

(B) Records of action taken by the system to correct violations of primary drinking water regulations shall be kept for a period not less than 3 years after the last action taken with respect to the particular violation involved.

(C) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local, state or federal agency, shall be kept for a period not less than 10 years after completion of the sanitary survey involved.

(D) Records concerning a variance or exemption granted to the system shall be kept for a period ending not less than 5 years following the expiration of such variance or exemption.

(E) Accurate and up-to-date maps and records showing the location of all mains, valves, hydrants, service connections, and other facilities including pumps, tanks and treatment plants shall be maintained for each CWS. An integrated map of the system showing supply, including ground water, surface water and GWUDI sources, as well as any water company

land associated with such sources, treatment, pumping and storage facilities and major mains shall be filed with the department and updated at least every 5 years.

(F) Records of each complaint received about water quality or adequacy shall be retained for each CWS. A record of the original complaint shall be kept for a period of 3 years subsequent to the final resolution of the complaint.

(G) Recordkeeping requirements for lead and copper. Any CWS or NTNC subject to the requirements of subsections (e)(7)(K), (e)(8) through (e)(10), inclusive, (h)(5), (i)(6), and (j)(7) through (j)(10), inclusive, of this section shall retain on its premises original records of all sampling data and analyses, reports, surveys, letters, evaluations, schedules, department determinations and any other information required by subsections (e)(7)(K), (e)(8) through (e)(10), inclusive, (h)(5) (i)(6), and (j)(7) through (j)(10), inclusive, of this section. Each CWS or NTNC shall retain the records required by this subparagraph for not less than 12 years.

(H) Records of any reports, test results, correspondence or other records collected as part of the system's cross connection control program, pursuant to subsection (f) of this section, shall be kept for not less than 5 years.

(I) A copy of the consumer confidence report shall be kept for not less than 5 years.

(J) A copy of the public records for combined and individual filter turbidity measurements, as required in subsection (e)(7)(S) of this section, shall be kept for not less than 3 years.

(K) A copy of the public notice and certification of compliance pursuant to subsection (i)(8) of this section shall be kept for not less than 3 years.

(L) A complete copy of the system's department-approved standard monitoring plan, including any department modification of the system's standard monitoring plan, shall be kept for as long as the system is required to retain the system's IDSE report under subparagraph (O) of this subdivision.

(M) A complete copy of the system's department-approved system specific study plan, including any department modification of the system's system specific study plan, shall be kept for as long as the system is required to retain the system's IDSE report under subparagraph (O) of this subdivision.

(N) A complete copy of the system's department-approved 40/30 certification shall be kept for 10 years after the date that the system submitted the system's certification. The system shall make the certification, all data upon which the certification is based, and any department notification available for review by the department and the public.

(O) A complete copy of the system's department-approved IDSE report shall be kept for 10 years after the date that the system submitted the system's IDSE report to the department. If the department modified the subsection (e)(11)(C) of this section monitoring requirements that the system recommended in the system's IDSE report or if the department approved alternative monitoring locations, the system shall keep a copy of the department's approval on file for 10 years after the date of the department's approval. The system shall make the IDSE report and any department approval available for review by the department and the public.

(P) Copies of any monitoring plans and monitoring results under subsection (e)(11)(C) of this section shall be kept for the same period of time as the records of analyses taken

under the plan are required to be kept under subparagraph (A) of this subdivision, except as specified elsewhere in this subdivision. The system shall make the monitoring plans and the monitoring results under subsection (e)(11)(C) of this section available for review by the department and the public.

(Q) Copies of monitoring plans developed pursuant to this section shall be kept for the same period of time as the records of analyses taken in accordance with the monitoring plan are required to be kept under subparagraph (A) of this subdivision, except as specified elsewhere in this section.

(R) Results from the initial round of source water monitoring under 40 CFR 141.701(a) and the second round of source water monitoring under subsection (e)(7)(T)(ii)(I) of this section shall be kept for a period of not less than 3 years after bin classification under subsection (j)(12)(A) of this section for the particular round of monitoring.

(S) A department-approved application in which the system requested approval of an exemption from source water monitoring because the system met the criteria in subsection (e)(7)(T)(ii)(III) of this section shall be kept for not less than 3 years.

(T) Results of treatment monitoring associated with microbial toolbox options under subsections (j)(13)(B) through (F), inclusive, of this section for shall be kept for not less than 3 years.

(U) In addition to the requirements of subparagraphs (A) through (T), inclusive, of this subdivision, a ground water system regulated under subsections (e)(7)(E), (e)(12) and (j)(14) of this section shall retain on its premises or at a convenient location near its premises the following records:

(i) Documentation of corrective actions shall be kept for not less than 10 years.

(ii) Documentation of notice to the public as required under subsection (i)(5)(F) of this section shall be kept for not less than 3 years.

(iii) Records of decisions under subsection (e)(12)(C)(v)(II) of this section and records of invalidation of fecal indicator-positive ground water source samples under subsection (e)(12)(F) of this section shall be kept for not less than 5 years.

(iv) For consecutive systems, documentation of notification provided to the wholesale system(s) under subsection (e)(12)(C)(iv)(I) of this section of total-coliform-positive samples that were not invalidated under subsection (e)(7)(F) of this section shall be kept for not less than 5 years.

(v) For systems, including wholesale systems, that are required to perform compliance monitoring under subsection (j)(14)(B) of this section, the following record-keeping requirements shall apply:

(I) Records of the system's required minimum RDC stated in the department's approval issued pursuant to subsection (j)(14)(B)(i) or (ii) of this section and the required minimum CT value, if the department stated a required minimum CT value in the department's approval issued pursuant to subsection (j)(14)(B)(i) or (ii) of this section, shall be kept for not less than 10 years.

(II) Records of the lowest daily RDC, and records of the date and duration of any failure to maintain the system's required minimum RDC or the system's required minimum CT value, or both, for a period of more than 4 hours shall be kept for not less than 5 years.

(III) Records of department-approved compliance requirements for a department-

approved alternative treatment and records of the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than 4 hours shall be kept for not less than 5 years.

(2) Records of decisions, as described in subparagraphs (A) and (B) of this subdivision, shall be maintained by the department in such a manner so as to allow the department to determine each system's current status.

(A) Any decision under subsection (e)(7)(A) of this section to reduce the physical parameters monitoring frequency for a CWS serving 1,000 persons or fewer to less than once per month.

(B) Any decision under subsection (e)(7)(B)(i) of this section to reduce the physical parameter monitoring frequency for a non-community water system using only ground water and serving 1,000 persons or fewer to less than once per quarter.

(m) **Emergency powers.** The state commissioner of public health may, upon receipt of information that the security of a public water system is threatened or suspicious activities are observed on or near water company land or the treatment of a public water supply is interrupted or the source of supply is damaged so as to impair the quality or the sufficiency of the supply or a contaminant is present in or is likely to enter a public water system which constitutes an imminent and substantial danger to health, take such actions and issue such orders as the commissioner may deem necessary in order to protect the health of any persons that may be affected.

(n) **Reservoir, ground water and water use monitoring.**

(1) Systems shall have meters installed at all sources of water supply so that the amount of water delivered to the distribution system can be measured.

(2) Systems shall take, record and retain for reference representative weekly readings of instantaneous flow rate and total quantity of water delivered over the previous week. Such records shall be submitted to the department upon request. The system shall take more frequent readings upon request of the department.

(3) Any water company maintaining a reservoir shall submit records of reservoir status to the department according to a schedule specified by the department which shall include at least weekly measurements of water elevation, instantaneous usable storage capacity, reservoir withdrawals, and amount of precipitation.

(4) Any water company with a ground water source in an unconsolidated, unconfined aquifer shall submit records of ground water status to the department according to a schedule specified by the department which shall include at least weekly measurements of instantaneous pumping rates and ground water elevations. A system of observation wells, approved by the department, shall be maintained to provide sufficient information on ground water elevations and ground water quality. To request such approval, the water company shall submit an application to the department requesting approval of a system of observation wells in accordance with subsection (t) of this section.

(5) Any water company serving more than 1,000 people or 250 service connections, and any other water company notified by the department, shall submit to the department on forms provided by the department, according to a schedule specified by the department, records of water use which shall include at least weekly measurements of the volume of water withdrawn from each source and for the total system. The volume of water bought

from or sold to another water company, and the type of restrictions, if any, imposed on water use and at least annual records of the volume of water used and average number of consumers shall be submitted to the department on forms provided by the department.

(o) The supply capacity of each community water system shall be maintained in excess of the demand of the system, with sufficient margin of safety to properly allow for:

(1) Sudden increases in consumption which may occur during a dry period.

(2) The time required to bring new sources of supply on line.

(3) Increases or growth in the service area which may be reasonably expected.

A plan shall be prepared for each community water system relating the safe yield and available water, as defined in sections 25-32d-1a(4) and 25-32d-1a(30) of the regulations of Connecticut State Agencies, of the supply system to the existing and projected demands of the service area. The plan shall be updated on a regular basis. If for any reason it becomes evident that the demands of the service area will exceed the supply capability of the system for a significant period of time, measures to effectively reduce consumption shall be promptly instituted for the system, and a program to provide sufficient supply capacity to meet existing and projected demands shall be implemented.

(p) Sources of supply, treatment, pumping, transmission and storage facilities of sufficient capacity shall be maintained to provide flows in excess of the maximum flows experienced in the community water system, and in individual service zones within integrated systems. Whenever peak period consumption interrupts water service to consumers under normal conditions, conservation measures that effectively reduce consumption shall be promptly instituted for the community water supply, and a program to provide sufficient supply, treatment, pumping, transmission and storage capacity to meet existing and projected peak period consumption shall be implemented.

(q) Essential water supply valves shall be maintained in operating condition.

(r) All consumers served by a CWS shall be notified by the CWS at least annually of an emergency telephone number which is continuously available for personal contact and reporting service problems. A CWS shall make a crew available to deal with emergencies within each CWS or shall have a working arrangement or contract with others, such as pump installers, pipe layers, electricians or another system, for such coverage. A CWS shall have available sufficient spare parts and clean up and disinfectant equipment. On or before January 1 of each year, or upon any change, a CWS shall report to the department in writing a continuously available emergency telephone number and other methods of contact.

(s) A program to reduce the amount of water which cannot be accounted for, shall be established and filed with the Department for review and approval. Such program shall include a schedule of implementation and consideration of the following elements:

(1) Calibration of supply and main line meters.

(2) Calibration of consumers' meters.

(3) Pipeline flow measurements.

(4) Leakage surveys.

(5) Inspection of bleeders.

(t) Department approval of applications, plans, waivers, requests and other documents.

(1) Unless otherwise specified, if an application, plan, request, waiver or other document requires department approval under any subsection of this section, the person seeking

approval of such application, plan, request, waiver or other document shall sign the document under oath and file the document in writing with the department. The application, plan, request, waiver or other document requiring approval shall contain a notice that false statements made therein are punishable in accordance with section 53a-157b of the Connecticut General Statutes. Such application, plan, request, waiver or other document shall set forth the reason or reasons for the application, plan, request, waiver, or other document requiring approval and grounds to support the granting of such application, plan, request, waiver or other document by the department. For purposes of this subsection, the term "person" means the person who is authorized to bind and act on behalf of the owner of the system.

(2) Unless otherwise specified, the department shall issue a decision in writing either approving or disapproving such application, plan, request, waiver or other document, in whole or in part. The department may determine that the department requires additional information to either approve or disapprove such document. If the department determines that such additional information is required, the system shall provide the requested information to the department on or before the date specified by the department in the department's written request for additional information. Failure of the system to provide the requested additional information on or before the date specified by the department in the department's written request shall result in the system's application, plan, request, waiver or other document requiring approval to be denied by the department. Any department approval, in whole or in part, may contain such conditions or orders as the department deems appropriate.

(u) Responsibility of the person or entity that owns or controls the system. The person or entity that owns or controls the system shall be responsible for complying with the requirements of this section.

(v) Sampling taps for source water monitoring.

(1) Systems shall install a sampling tap or taps for sampling a ground water source or sources such that water can be sampled directly from each individual source of supply.

(2) Systems shall locate the sampling tap or taps for sampling ground water and surface water sources before any treatment, and in a location that excludes water from storage tanks and the distribution system.

(3) Systems shall point sampling tap or taps for sampling ground water sources downward and free of any obstructions, and shall allow easy access and sufficient clearance for sampling containers.

(4) Any sampling tap or taps installed by systems for the purposes of sampling a ground water source shall be of the smooth-ended, threadless type.

(w) **Generator and emergency contingency and response plan requirements.**

(1) (A) (i) Each CWS shall have installed and maintained in accordance with the schedule in Table 1-W1 of this clause based on the CWS's type a standby stationary on-site generator capable of providing sufficient power to supply the power demands of the CWS at each of the CWS's facility locations. At a minimum, the generator shall be equipped with an automatic transfer switch system, fueled by either propane or natural gas, and in compliance with all applicable federal, state and local requirements, including all requirements applicable to generators and the installation of such generators. For purposes

of this subsection, "facility location" includes, but is not limited to, sources, pumping stations, treatment plants, and storage tanks at which electric power is required to maintain a continuous supply of potable water at adequate volume and pressures.

TABLE 1-W1. COMPLIANCE DATES

If the CWS is this type of CWS	**The CWS shall comply with subparagraph (A) not later than:**
(1) CWS serving ≥ 100,000 people	1 year after the effective date of this subsection
(2) CWS serving 10,000 – 99,999 people	2 years after the effective date of this subsection
(3) CWS serving < 10,000 people	3 years after the effective date of this subsection

(ii) If extenuating circumstances prevent a CWS from complying on or before the date of compliance in Table 1-W1 of clause (i) of this subparagraph, a CWS may submit an application to the department requesting an extension by which to comply with the requirements of clause (i) of this subparagraph. Such application shall include the extenuating circumstances that prevent the CWS from complying with the requirements of clause (i) of this subparagraph, and shall be submitted in accordance with subsection (t) of this section prior to the CWS's date of compliance in Table 1-WI of clause (i) of this subparagraph. Extenuating circumstances include, but are not limited to, a CWS's acquisition of another CWS pursuant to sections 16-262n and 16-262o of the Connecticut General Statutes and the acquired CWS did not comply on or before the date of compliance in Table 1-W1 of clause (i) of this subparagraph.

(B) A CWS may use a portable generator to meet the requirements of subparagraph (A) of this subdivision if the CWS meets the following requirements, in addition to all federal, state and local requirements applicable to generators and the installation of such generators:

(i) The portable generator shall be capable of providing sufficient power to supply the power demands of the CWS at each of the facility locations at which the portable generator will be used;

(ii) The CWS shall have installed at each of the facility locations at which a portable generator will be used a manual or automatic transfer switch system to facilitate transition to generator power; and

(iii) The CWS shall have installed at each of the facility locations at which a portable generator will be used suitable controls and connections by which to connect the portable generator.

(C) A CWS may use an alternative source of backup power to meet the requirements of subparagraph (A) of this subdivision if the alternative source of backup power is an effective source of backup power that meets the requirements in clauses (i) through (iv), inclusive, of this subparagraph. The CWS shall file with the department prior to the CWS's date of compliance in Table 1-WI of subparagraph (A)(i) of this subdivision a statement stating the alternative source of backup power the CWS is using to meet the requirements of subparagraph (A) of this subdivision is an effective source of backup power because it meets

the requirements in clauses (i) through (iv), inclusive, of this subparagraph. Such statement shall be signed under oath by the owner, or the person who is authorized to bind and act on behalf of the owner, of the CWS and shall contain a notice that false statements made therein are punishable in accordance with section 53a-157b of the Connecticut General Statutes.

(i) The alternative source of backup power shall be capable of providing sufficient power to supply the power demands of the CWS at the facility location at which the alternative source of backup power will be used;

(ii) The CWS shall have installed at the facility location at which the alternative source of backup power will be used a manual or automatic transfer switch system to facilitate transition to the alternative source of backup power;

(iii) The alternative source of backup power shall, when in use, be connected to a location that meets all applicable federal, state and local requirements; and

(iv) The CWS shall have installed at the facility location at which the alternative source of backup power will be used suitable controls and connections by which to connect the alternative source of backup power, if applicable.

(D) (i) A standby stationary on-site generator installed by the CWS or a portable generator available for use by the CWS prior to the effective date of this subsection, and any replacement of such generator, may be fueled by liquid fuel, instead of propane or natural gas, and shall not be required to meet the conditions in subclauses (I) and (II) of this clause. A standby stationary on-site generator installed or a portable generator to be used by the CWS on or after the effective date of this subsection may be fueled by liquid fuel only if the CWS meets the conditions in subclauses (I) and (II) of this clause. For purposes of this section, "liquid fuel" means a liquid fueling agent including, but not limited to, diesel, gasoline, oil, or kerosene.

(I) The liquid fuel used for fueling the standby stationary on-site or portable generator shall be stored in an above-ground tank with a containment area capable of holding at least 110 percent of the full volume of the tank storing the liquid fuel; and

(II) The above-ground tank in which the liquid fuel is stored, liquid-fuel supply line and liquid-fueled generator shall be located more than 200 feet away from the CWS's source or sources of supply.

(ii) If extenuating circumstances prevent a CWS from complying with the conditions in clauses (i)(I) and (i)(II) of this subparagraph, a CWS may submit an application to the department requesting a waiver from such conditions. Such application shall include the extenuating circumstances that prevent the CWS from complying with the conditions in clauses (i)(I) and (i)(II) of this subparagraph, and shall be submitted in accordance with subsection (t) of this section. Extenuating circumstances include, but are not limited to, the existence of conditions at the location at which such liquid fuel is stored that prevent a CWS from complying with the conditions in clauses (i)(I) and (i)(II) of this subparagraph.

(E) Each CWS that has a standby stationary on-site generator installed or a portable generator that was available for use prior to the effective date of this subsection shall file with the department a statement stating the make and model of such generator not later than 8 months after the effective date of this subsection. If a CWS fails to file such information with the department not later than 8 months after the effective date of this subsection, the department shall not recognize the CWS's stationary on-site generator or a portable

generator as a generator installed or available for use, respectively, prior to the effective date of this subsection for purposes of this subparagraph and the CWS shall comply with the requirements of subparagraph (D) of this subdivision. If extenuating circumstances prevent or have prevented a CWS from providing such information to the department not later than 8 months after the effective date of this subsection, a CWS may submit an application to the department requesting an extension by which to provide such information to the department. Such application shall include the extenuating circumstances that prevent or have prevented the CWS from providing such information to the department not later than 8 months after the effective date of this subsection, and shall be submitted in accordance with subsection (t) of this section. Extenuating circumstances include, but are not limited to, a CWS's acquisition of another CWS pursuant to sections 16-262n and 16-262o of the Connecticut General Statutes and the acquired CWS did not submit the required information timely.

(2) Subdivision (1) of this subsection shall not apply to those CWSs subject to sections 16-11-99 through 16-11-99d, inclusive, of the Regulations of Connecticut State Agencies.

(3) (A) Each CWS that is not subject to the requirements in section 25-32d of the Connecticut General Statutes shall prepare not later than 8 months after the effective date of this subsection, an emergency contingency and response plan. The plan shall contain the CWS's preparations for and proposed responses to any disruption of the CWS's supply of water to the CWS's consumers due to a loss of power of the CWS's water supply, including, but not be limited to, the following information:

(i) The CWS's plan for restoring service to the CWS's consumers in the event of a disruption of the CWS's supply of water to the CWS's consumers due to a loss of power of the CWS's water supply;

(ii) The CWS's plan for maintaining an adequate and safe supply of water to the CWS's consumers during a disruption of the CWS's supply of water to the CWS's consumers due to a loss of power of the CWS's water supply; and

(iii) The CWS's plan for notifying the CWS's consumers and local emergency management officials, including the department and the chief elected official of any municipality and any local health department or district health department in which the CWS is located, in accordance with section 19-13-B46 of the Regulations of Connecticut State Agencies, of the status of the CWS prior to, during, and following an event during which there is a disruption of the CWS's supply of water to the CWS's consumers due to a loss of power of the CWS's water supply.

(B) The emergency contingency and response plan shall be kept up to date and on file at the CWS. The CWS shall make the plan available to the department for review upon the request of the department and at the time of a sanitary survey.

(4) Each CWS subject to this subsection shall submit to the department in writing in its annual submission required under the provisions of section 25-33 of the Connecticut General Statutes a verification that the CWS has complied with the requirements of this subsection and that the CWS's generator or generators perform in accordance with the manufacturer's specifications to ensure that the generator or generators are capable of providing sufficient power to supply the power demands of the CWS at each of the CWS's facility locations.

(5) Failure to comply with the provisions of this subsection may result in the imposition

of a civil penalty under the provisions of section 25-32e of the Connecticut General Statutes.

(Effective August 23, 1994; Amended September 4, 1997; Amended July 26, 2001; Amended December 5, 2001; Amended May 2, 2003; Amended March 30, 2004; Amended August 1, 2005; Amended January 14, 2014; Amended December 17, 2015)