DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Commission

REGULATION NO. 11 - COLORADO PRIMARY DRINKING WATER REGULATIONS

5 CCR 1002-11

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

11.1 AUTHORITY AND PURPOSE

11.1(1) Authority

The Water Quality Control Commission has promulgated the *Colorado Primary Drinking Water Regulations* pursuant to sections 24-4-104, 24-4-105, 25-1.5-101, 25-1.5 Part 2, 25-1-109, 25-1-114, 25-1-114.1, and 25-8-202, Colorado Revised Statutes.

11.1(2) Purpose

The purpose of the *Colorado Primary Drinking Water Regulations* is to assure the safety of public drinking water supplies and to enable the state of Colorado to assume responsibility for enforcing the standards established by the federal Safe Drinking Water Act (i.e., Public Law 93-523), as amended.

11.1(3) RESERVED

11.1(4) Severability Clause

The provisions of these regulations are severable. If any regulation, rule, section, paragraph, or other portion of the *Colorado Primary Drinking Water Regulations* is, for any reason, held inoperative, unconstitutional, void or invalid, the validity of the remaining portions shall not be affected.

11.1(5) Applicability

(a) The *Colorado Primary Drinking Water Regulations* apply to each public water system, unless the public water system meets all of the following conditions:

(i) Consists only of distribution facilities and/or storage facilities.

(ii) Does not have any collection facilities.

(iii) Does not have any treatment facilities.

(iv) Obtains all of its water from a public water system to which these regulations apply.

(v) Is not owned or operated by a public water system to which these regulations apply.

(vi) Does not sell water to any person.

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

(b) The Department, regardless of any other provisions of the *Colorado Primary Drinking Water Regulations*, must enforce the *Colorado Primary Drinking Water Regulations* against federal facilities, on federally owned lands within the State, excluding Native American Lands.

11.1(6) General Authorities

(a) Testing and Monitoring Requirements

(i) To demonstrate compliance with the *Colorado Primary Drinking Water Regulations* or terms and conditions of enforcement orders, the Department may require the supplier to conduct tests and monitoring as the Department determines is necessary to protect public health.

(A) These tests must be conducted using methods approved by the Department.

(ii) The Department may require the supplier to install, maintain, and use instrumentation to monitor and record data.

(A) The supplier must submit periodic reports on a continuing basis to demonstrate compliance with applicable regulations.

(b) Entry and Inspection of Public Water Systems

(i) Upon presentation of proper credentials, authorized representatives of the Department may enter and inspect, at any reasonable time and in a reasonable manner, any establishment, facility, or any other property, premises, or place owned, operated or under the control of a public water system or other person for the purpose of investigating any actual, suspected, or potential violations of any minimum general sanitary standards required by section 25-1.5-202, Colorado Revised Statutes.

(ii) During entry, authorized representatives may collect drinking water samples.

(A) Any sample collected may be used as evidence in an enforcement action.

(B) A split or duplicate sample shall be offered to the supplier.

(C) The supplier shall be promptly provided a copy of the sample results.

(iii) If entry or inspection is denied or not consented to by the supplier, the Department has the authority to obtain a warrant to enter and inspect said property, premises, or place and shall obtain the warrant from the district or county court for the judicial district or county in which the property, premises, or place is located.

(A) The district and county courts of the state have the authority to issue a warrant if the Department shows the need for the entry and inspection.

(B) A copy of the inspection report(s) must be provided to the court within a reasonable time after the inspection.

(c) Enforcement Authority

(i) If the supplier violates any provision of the *Colorado Primary Drinking Water Regulations*, the Department may issue an enforcement order requiring the supplier to take actions necessary to correct the violation(s). The Department may issue an enforcement order:

(A) Upon finding significant deviation from plans and specifications or significant inaccuracies in data submitted to the Department which the Department used as the basis for approval of proposed construction or modifications to a public water system;

(B) Due to the incidence of disease, the source of which is reasonably identified by the Department as originating from the consumption of drinking water from a public water system;

(C) Upon determining that contaminants are present in a public water supply and that the presence of these contaminants presents an unreasonable risk to public health; or

(D) Upon determining that a physical condition or an operation or maintenance practice poses an unreasonable risk to public health.

(ii) An enforcement order may require the supplier to:

(A) Design, redesign, install, modify, construct or reconstruct facilities, which may include sources and treatment;

(B) Use treatment techniques;

(C) Acquire an alternative source;

(D) Take other corrective action(s); or

(E) Demonstrate the adequacy of control measures and use operational techniques and practices that will eliminate any violations.

(iii) A supplier that violates the *Colorado Primary Drinking Water Regulations* or an enforcement order(s) may be subject to civil or criminal actions pursuant to the provisions of sections 25-1-114 and 25-1-114.1, Colorado Revised Statutes.

(iv) The supplier may request a hearing to contest an enforcement order.

(A) Requests for a hearing must:

(I) Be filed in writing with the Department no later than 30 days after service of the enforcement order;

(II) State the grounds on which the enforcement order is contested; and

(III) State the amount of time the supplier estimates will be required for the hearing.

(B) The hearing regarding the enforcement order shall be held in accordance with applicable provisions of Article 4 of Title 24, Colorado Revised Statutes.

11.2 GENERAL REQUIREMENTS

11.2(1) Tampering

(a) "TAMPER" means to introduce a contaminant into a public water system or into drinking water or to otherwise interfere with drinking water or the operation of a public water system with the intention of harming people or public water systems. It does not include the standard accepted treatment procedures performed by the supplier in preparing water for human consumption.

(b) The supplier must notify the Department as soon as possible but no later than 10 a.m. of the next calendar day after any tampering, suspected tampering, or receipt of a tampering threat.

(c) The supplier must submit written notification to the Department no later than five calendar days after any tampering, suspected tampering, or receipt of a tampering threat explaining the circumstances of the occurrence and identifying the action(s) taken to ensure the ability of the supplier to provide a safe and reliable supply of drinking water and to prevent any reoccurrence.

11.2(2) Identification of Construction Materials

(a) For community water systems, the supplier must identify whether any of the following construction materials are present in the distribution system and report to the Department the existence of:

(i) Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing.

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

(iii) Galvanized piping, service lines, and home plumbing.

(iv) Ferrous piping materials such as cast iron and steel.

(v) Asbestos cement pipe.

(b) For community water systems, the Department may require the supplier to identify and report the presence of other construction materials in the distribution system that may contribute contaminants to the drinking water (e.g., vinyl-lined asbestos cement pipe or coal tar-lined pipes and tanks).

11.2(3) Prohibition on the Use of Lead Pipes, Solder, and Flux

Any pipe, solder, or flux, which is used after June 19, 1986 in the installation or repair of any public water system, or any plumbing in residential or non-residential buildings providing water for human consumption that is connected to a public water system, must be lead free.

(a) This prohibition does not apply to leaded joints necessary for the repair of cast iron pipes.

11.2(4) Violations and Response for Monitoring and Sampling

(a) If the supplier fails to comply with any monitoring or sampling requirement of the *Colorado Primary Drinking Water Regulations* a monitoring violation occurs.

(b) In the event of a monitoring or sampling violation, the supplier must:

(i) Report the violation to the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 3 public notice as specified in 11.33, unless otherwise specified.

11.2(5) Guidance Documents and Policy Documents

(a) The Department has developed guidance documents designed to assist suppliers with understanding the regulations and to explain the specific requirements the supplier must meet to maintain compliance.

(b) The Department has developed a number of internal policy documents designed to address special primacy requirements, which are defined in 40 CFR 142, in order to maintain primary enforcement responsibility in the state of Colorado, and therefore are not included in these regulations.

(c) While not regulatory in nature, these policies and guidance are public record and copies of the available guidance and policy documents may be obtained by requesting them from the Department at:

Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
(303) 692-3500

These documents may also be available on the Department's Internet website at the following address: www.colorado.gov/cdphe.

11.2(6) Materials Incorporated by Reference

(a) Date of Incorporation

(i) Throughout these regulations, requirements promulgated by the U.S. Environmental Protection Agency have been adopted and incorporated by reference. The federal references cited herein include only those versions that were in effect as of April 9, 2018, and not later amendments to the incorporated material.

(ii) All other materials incorporated by reference in the *Colorado Primary Drinking Water Regulations* include only those versions cited and not later amendments to incorporated material.

(b) Location of Materials Incorporated by Reference

(i) The requirements promulgated by the U.S. Environmental Protection Agency incorporated by reference are available at no cost in the online edition of the Code of Federal Regulations (CFR) hosted by the United States Government Printing Office, online at www.govinfo.gov.

(ii) All other materials incorporated by reference may be examined at any state publications depository library, the Laboratory Services Division of the Department, or the Department at:

Colorado Department of Public Health and Environment
Water Quality Control Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
(303) 692-3500

(c) If the material incorporated by reference refers to other sections of the referenced document that conflict with current language of the *Colorado Primary Drinking Water Regulations*, the current language of the *Colorado Primary Drinking Water Regulations* takes precedence.

11.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

Definitions of general applicability to the *Colorado Primary Drinking Water Regulations* are as specified here and shall be liberally construed to protect public health and the quality of drinking water supplied to the public. Additional definitions are specified throughout the *Colorado Primary Drinking Water Regulations* and are applicable to the rule in which they are defined. As used in the *Colorado Primary Drinking Water Regulations*:

(1) "4-LOG TREATMENT OF VIRUSES" means 99.99 percent inactivation and/or removal of viruses.

(2) "ACT" means the federal Public Health Service Act, as amended by the Safe Drinking Water Act, Public Law 93-523.

(3) "AVERAGE RESIDENCE TIME" means a point in the distribution system where treated water has been in the system for approximately half of its longest or maximum time in the system, as measured by water transport time. Sample locations between 25 and 75 percent of the maximum are considered to be representative of average residence time, provided that in total, the average of the selected locations approximate 50 percent of the maximum residence time and take into account population densities and their locations.

(4) "BACKFLOW CONTAMINATION EVENT" means backflow into a public water system from an uncontrolled cross connection such that the water quality no longer meets the *Colorado Primary Drinking Water Regulations* or presents an immediate health and/or safety risk to the public.

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

(6) *"*BEST AVAILABLE TECHNOLOGY" or "BAT" means the best technology, treatment techniques, or other means that the EPA Administrator finds available, considering cost and after examination for efficacy under field conditions and not solely under laboratory conditions.

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

(8) "CERTIFIED LABORATORY" means a laboratory certified by the State of Colorado for analysis of drinking water.

(9) *"*COAGULATION" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

(10) "COMBINED DISTRIBUTION SYSTEM" means an interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

(11) *"*COMMUNITY WATER SYSTEM" means a public water system that supplies at least 15 service connections used by year-round residents or that regularly supplies at least 25 year-round residents.

(12) "COMPLIANCE CYCLE" means the nine-year calendar year cycle during which the supplier must monitor. Each compliance cycle consists of three three-year compliance periods.

(13) "COMPLIANCE PERIOD" means a three-year calendar year period within a compliance cycle.

(14) "CONSECUTIVE SYSTEM" means a public water system that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

(15) "CONSTRUCTION" means the erection, building, modification, reconstruction, improvement or expansion of waterworks.

(16) "CONTAMINANT" means any physical, chemical, biological, or radiological substance or matter in water.

(17) "CONSUMER" means any person that has the opportunity to consume finished water from a public water system.

(18) "CONVENTIONAL FILTRATION TREATMENT" means a series of processes including coagulation, flocculation, sedimentation (or equivalent form of clarification), and granular media filtration resulting in substantial particulate removal.

(19) "CROSS CONNECTION" means any connection that could allow any water, fluid, or gas such that the water quality could present an unacceptable health and/or safety risk to the public, to flow from any pipe, plumbing fixture, or a customer's water system into a public water system's distribution system or any other part of the public water system through backflow.

(20) "CT" or "CT_{calc}" means the product of residual disinfectant concentration (C) in mg/L determined before or at the first customer, and the corresponding disinfectant contact time (T) in minutes (i.e., C x T).

(21) "CUSTOMER" means billing units or service connections that receive finished water.

(22) "DEPARTMENT" means the Colorado Department of Public Health and Environment as created by section 25-1-102(1), Colorado Revised Statutes.

(23) "DIATOMACEOUS EARTH FILTRATION" means a process resulting in substantial particulate removal in which (1) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (2) while the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

(24) "DIRECT FILTRATION" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

(25) "DISINFECTANT" means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, ozone, and ultraviolet light, added to water in any part of the treatment or distribution process that is intended to kill or inactivate pathogenic microorganisms.

(26) "DISINFECTANT CONTACT TIME" 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.

(27) "DISINFECTION" means a process that inactivates pathogenic microorganisms in water by chemical oxidants, ultraviolet light, or equivalent agents.

(28) "EMERGENCY SOURCE/CONNECTION" means a water facility that is only used as the result of extreme circumstances, and is otherwise kept offline. These facilities may be either connected or disconnected from a treatment plant/distribution system.

(29) "ENFORCEMENT ORDER" means an order issued for the purpose of notifying the supplier of a public water system that it is in violation of the *Colorado Primary Drinking Water Regulations* or for the purpose of requiring the supplier of a public water system to cease such violations. Enforcement orders may prescribe corrective measures necessary to achieve compliance with the *Colorado Primary Drinking Water Regulations*.

(30) "ENTRY POINT" means a location before or at the first customer which is representative of finished water. The entry point may represent finished water from multiple treatment plants and/or multiple sources.

(31) "FILTRATION" means a process for removing particulate matter from water by passage through porous media.

(32) "FINISHED WATER" or "FINISHED DRINKING WATER" means water that is supplied to the distribution system of a public water system and intended for distribution and human consumption without further treatment, including disinfection contact time, except treatment as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).

(33) "FIRST CUSTOMER" means the first potable water service connection that serves finished water. Typically, the first customer is the water treatment plant's domestic water system.

(34) "FLOCCULATION" means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settled particles through gentle stirring by hydraulic or mechanical means.

(35) "GROUNDWATER" means any water under the surface of the ground that is not surface water or groundwater under the direct influence of surface water.

(36) "GROUNDWATER SYSTEM" means a public water system that uses groundwater not under the direct influence of surface water as its sole source of water and does not include public water systems that combine all of their groundwater with surface water or groundwater under the direct influence of surface water before to treatment.

(37) "GROUNDWATER UNDER THE DIRECT INFLUENCE OF SURFACE WATER" or "GWUDI" means any water beneath the surface of the ground with:

(a) Significant occurrence of insects or other macro-organisms, algae, or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*; or

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

(38) "INACTIVATION" means the use of a disinfectant (e.g., chorine, chloramines, ozone) to interrupt the ability of a pathogen to replicate therefore leaving it unable to infect.

(39) "LEAD FREE" means:

(a) Less than or equal to (≤) 0.2 percent lead when used with respect to solders and flux.

(b) A weighted average of less than or equal to (≤) 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures.

(40) "LEVEL 1 ASSESSMENT" means an evaluation conducted by the supplier to identify sanitary defects, inadequate or inappropriate distribution system coliform sampling practices, and (when possible) the cause(s) that triggered the assessment. Minimum elements must include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired, changes in distribution system maintenance and operation, including water storage, that could affect distributed water quality, source and treatment considerations that affect distributed water quality, existing water quality monitoring data, and inadequacies in sample sites, sampling protocol, and sample processing. The supplier must conduct the assessment consistent with any Department-specified directives based on the size and type of the system and the size, type, and characteristics of the distribution system.

(41) "LEVEL 2 ASSESSMENT" means an evaluation conducted by the Department or Department-approved party to identify sanitary defects, inadequate or inappropriate distribution system coliform sampling practices, and (when possible) the cause(s) that triggered the assessment. A Level 2 assessment is a more detailed examination of the system than a Level 1 assessment. A Level 2 assessment involves a comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. A Level 2 assessment must be completed by the Department or a Department-approved party. Minimum elements must include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired, changes in distribution system maintenance and operation, including water storage, that could affect distributed water quality, source and treatment considerations that affect distributed water quality, existing water quality monitoring data, and inadequacies in sample sites, sampling protocol, and sample processing. If required by the Department, the supplier must comply with any expedited schedules or additional actions in the case of an *E.coli* violation.

(42) "LOCATIONAL RUNNING ANNUAL AVERAGE" or "LRAA" means the average of sample results for samples collected at a particular monitoring location during the most recent four calendar quarters. If the supplier fails to complete four consecutive quarters of sampling, the LRAA is based on the available sample results from the most recent four calendar quarters.

(43) "MAXIMUM CONTAMINANT LEVEL" or "MCL" means the maximum level of a contaminant allowed in drinking water, which is delivered to any consumer.

(44) "MAXIMUM CONTAMINANT LEVEL GOAL" or "MCLG" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effects on human health would occur, and which allows an adequate margin of safety. Maximum contaminant level goals are non-enforceable health goals.

(45) "MAXIMUM RESIDENCE TIME" means a point in the distribution system where the treated water has been in the system for the longest or maximum time, as measured by water transport time. Sample locations between 90 and 100 percent of the maximum are considered to be representative of maximum residence time.

(46) "MAXIMUM RESIDUAL DISINFECTANT LEVEL" or "MRDL" means the level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse effects on human health.

(47) "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 human health would occur, and which allows an adequate margin of safety. MRDLGs are non-enforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

(48) "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.

(49) "NEW SOURCE" means a source not previously used by the public water system or a source not previously approved by the Department.

(50) "NON-COMMUNITY WATER SYSTEM" means a public water system that is not a community water system. A non-community water system is either a "transient, non-community water system" or a "non-transient, non-community water system."

(51) "NON-TRANSIENT, NON-COMMUNITY WATER SYSTEM" means a public water system that regularly serves a population of at least 25 of the same people for at least six months per year and is not a community water system.

(52) "NON-TRANSIENT POPULATION" means the average number of people served per day during the year or normal operating period(s), who do not reside at the place supplied by the system, but have a regular opportunity to consume water produced by the system. Regular opportunity is defined as four or more hours per day, for four or more days per week, for six or more months per year.

(53) "NOTIFY" means to inform by written, verbal, or other means, unless otherwise stated.

(54) "PERSON" means an individual, corporation, company, association, partnership, municipality, or State, Federal, or tribal agency.

(55) "PLANS AND SPECIFICATIONS" means the technical design drawings and specifications for waterworks. For new waterworks, this also includes technical, financial, and managerial plans.

(56) "PLANT INTAKE" or "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.

(57) "POINT-OF-ENTRY TREATMENT DEVICE" or "POE" means a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

(58) "POPULATION SUPPLIED" means the average daily population that occurs during the busiest month of the year or normal operating period(s). Population supplied is further defined as the sum of resident, non-transient, and transient populations.

(59) "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.

(60) "PUBLIC WATER SYSTEM" or "PWS" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves an average of at least 25 individuals daily at least 60 days per year. A public water system is either a community water system or a non-community water system. Such term does not include any special irrigation district. Such term includes:

(a) Any collection, treatment, storage, and distribution facilities under control of the supplier of such system and used primarily in connection with such system.

(b) Any collection or pretreatment storage facilities not under such control, which are used primarily in connection with such system.

(61) "PUBLIC WATER SYSTEM THAT HAULS WATER" means a public water system that delivers, by vehicle, finished water through a non-piped conveyance such as a vehicle mounted tank or container.

(62) "RECYCLE" means the act of returning recycle flows to a plant's primary treatment process.

(63) "RECYCLE FLOWS" means any water, solid or semi-solid, generated by a plant's treatment processes, operational processes, and residual treatment processes, that is returned to the plant's primary treatment process.

(64) "RESIDENT POPULATION" means the average number of people whose primary residence is supplied by the system. The resident does not have to live at the residence for 365 days per year for it to be considered his/her primary residence.

(65) "RESIDUAL DISINFECTANT CONCENTRATION" means the concentration of disinfectant measured in mg/L in a representative sample of water.

(66) "RUNNING ANNUAL AVERAGE or "RAA" means the average of sample results for samples collected during the most recent four calendar quarters. If the supplier fails to complete four consecutive quarters of sampling, the RAA is based on the available sample results from the most recent four calendar quarters.

(67) "SANITARY DEFECT" means a defect:

(i) That could provide a pathway of entry for microbial contamination into the distribution system; or

(ii) That is indicative of a failure or imminent failure in a barrier that is already in place.

(68) "SEASONAL SYSTEM" means a non-community water system that is not operated as a public water system on a year-round basis, regardless of whether the system is pressurized or de-pressurized during the off-season. All seasonal systems must complete Department-approved start-up procedures before supplying water to the public each season.

(69) "SECONDARY MAXIMUM CONTAMINANT LEVELS or "SMCLs" means the maximum level of a contaminant allowed in water which is delivered to the consumer of a public water system. The SMCLs apply to public water systems and which, in the judgment of the EPA Administrator, are requisite to protect the public health. Contaminants added to the water under circumstances controlled by the consumer, except those resulting from corrosion of piping and plumbing caused by water quality, are excluded from this definition. The SMCLs are not enforceable, but are intended as guidelines. The SMCLs are defined in 40 CFR 143.3.

(70) "SEDIMENTATION" means a process for removal of solids before filtration by gravity or separation.

(71) "SERVICE CONNECTION" means a connection to a system that delivers water by constructed conveyance. The definition does not include connections that deliver water by a constructed conveyance other than a pipe if:

(i) The water is used exclusively for purposes other than residential uses (consisting of drinking, bathing, and cooking, or other similar uses);

(ii) The Department determines that an alternative water source to achieve the equivalent level of public health protection provided by the applicable *Colorado Primary Drinking Water Regulations* is provided for residential or similar uses for drinking and cooking; or

(iii) The Department determines that the water provided for residential or similar uses for drinking, cooking, and bathing is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable Colorado Primary Drinking Water Regulations.

(72) "SIGNIFICANT DEFICIENCY" means any situation, practice, or condition in a public water system with respect to design, operation, maintenance, or administration, that the state determines may result in or have the potential to result in production of finished drinking water that poses an unacceptable risk to health and welfare of the public served by the water system. Significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the Department determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

(73) "SMALL SYSTEM COMPLIANCE TECHNOLOGY" or "SSCT" means a treatment technology that is affordable (according to the affordability criteria set forth by the EPA) by small systems and allows systems to achieve compliance with the MCL or treatment technique.

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

(75) "SOURCE" means the point at which a public water system diverts water from its natural or man-made origin.

(76) "SOURCE WATER SAMPLE" means a sample collected before any treatment that represents influent raw source water quality.

(77) "SPECIAL IRRIGATION DISTRICT" means an irrigation district in existence before May 18, 1994 that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system comply with the exclusion provisions outlined in the definition of service connections.

(78) "SPECIAL PURPOSE SAMPLE" means a total coliform sample that is not collected in accordance with 11.16. Special purpose samples include samples that are taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair. Repeat samples collected pursuant to 11.16 are not considered special purpose samples and must be used to determine if the coliform treatment technique trigger has been exceeded. Special purpose samples will not be used to determine compliance with sampling requirements, the *E. coli* MCL, or in determining if a treatment technique is triggered.

(79) "SPENT FILTER BACKWASH WATER" means a stream containing particles that are dislodged from filter media when water is forced back through a filter (backwashed) to clean the filter. Spent filter backwash water contains particles including coagulants, metals, and microbes such as *Cryptosporidium*.

(80) "STATE" means the State of Colorado.

(81) "SUPPLIER OF WATER" or "SUPPLIER" means any person who owns or operates a public water system.

(82) "SURFACE WATER" means any water source that is open to the atmosphere and subject to surface runoff. Groundwater found to be under the direct influence of surface water is classified as surface water.

(83) "SURFACE WATER SYSTEM" means a public water system that uses, in whole or in part, surface water or groundwater under the direct influence of surface water as a source of water.

(84) "TOTAL ORGANIC CARBON" or "TOC" means a parameter measuring the total amount of carbon in water, present as organic molecules. It is used as a surrogate for disinfection byproduct precursors and as critical control point monitoring.

(85) "TRANSIENT, NON-COMMUNITY WATER SYSTEM" means a non-community water system that serves a population of at least 25 people per day for at least 60 days per year and is not a non-transient, non-community water system or a community water system.

(86) "TRANSIENT POPULATION" means the average number of individuals served per day during the year or annual operating period(s), who have an opportunity to consume water from the system, but who do not meet the definition of either resident population or non-transient population.

(87) "TREATMENT TECHNIQUE REQUIREMENT" means a requirement that specifies a treatment technique(s) for a contaminant which leads to a sufficient reduction in the level of the contaminant to comply with the requirements of the *Colorado Primary Drinking Water Regulations*. A treatment technique may also be a requirement that is intended to prevent situations that have the potential to have serious adverse effects on human health.

(88) "VIOLATION" means failure to comply with any requirement of the *Colorado Primary Drinking Water Regulations*.

(89) "VIRUS" means a virus of fecal origin, which is infectious to humans by waterborne transmission.

(90) "WATERBORNE DISEASE OUTBREAK" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the appropriate local or State agency.

(91) "WATERWORKS" means the facilities that are directly involved in the production, treatment, or distribution of water for public water systems.

(92) "WATER QUALITY CONTROL COMMISSION" means the commission that has been created within the Colorado Department of Public Health and Environment pursuant to section 25-8-201, Colorado Revised Statutes.

(93) "WATER VENDING AND DISPENSING MACHINES" means any device which, upon payment dispenses water into a container.

(94) "WHOLESALER" means any person who owns or operates and is legally responsible for a wholesale system.

(95) "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 one or more consecutive systems.

TABLE 11.3-I ACRONYMS AND ABBREVIATIONS

Term:	Means:
AL	Action Level
BAT	Best Available Technology
C	Disinfectant Concentration
CCR	Consumer Confidence Report
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
CFU	Colony-Forming Units
CPDWR	*Colorado Primary Drinking Water Regulations*
CPE	Comprehensive Performance Evaluation
CT	Disinfectant Concentration x Contact Time
CTAP	Comprehensive Technical Assistance Project
EPA	United States Environmental Protection Agency
HAA5	Haloacetic Acids
HPC	Heterotrophic Plate Count
IDSE	Initial Distribution System Evaluation
IFE	Individual Filter Effluent
LRAA	Locational Running Annual Average
LRV	Log Removal Value
$LRV_{C\text{-}Test}$	Removal Efficiency
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFL	Million Fibers per Liter
mJ/cm^2	Millijoules per Square Centimeter
MPN	Most Probable Number
MRDL	Maximum Residual Disinfectant Level
MRDLG	Maximum Residual Disinfectant Level Goal
mrem	Millirems
nm	Nanometers
NPDWR	National Primary Drinking Water Regulations
NTU	Nephelometric Turbidity Unit
PCB	Polycarbonated Biphenyls
pCi	Picocurie
ppb	Parts Per Billion, or Micrograms (10^{-6}) per Liter (mg/L)
ppm	Parts Per Million, or Milligrams (10^{-3}) per Liter (mg/L)
ppq	Parts Per Quadrillion, or Picograms (10^{-12}) per Liter (pg/L)
ppt	Parts Per Trillion, or Nanograms (10^{-9}) per Liter (ng/L)
PVC	Polyvinyl Chloride
QCRV	Quality Control Release Value
RAA	Running Annual Average
SMCL	Secondary Maximum Contaminant Level
SSCT	Small System Compliance Technology

SOC	Synthetic Organic Chemical
SUVA	Specific Ultraviolet Absorbance
T	Disinfectant Contact Time
TOC	Total Organic Carbon
TTHM	Total Trihalomethanes
UV	Ultraviolet
VOC	Volatile Organic Chemical

11.4 PLANS APPROVAL FOR THE LOCATION AND CONSTRUCTION OF WATERWORKS

11.4(1) Prior Approval Requirements

(a) For new community or non-transient, non-community water systems, the supplier must not begin construction of the new water system until the supplier completes and receives Department approval of a capacity (technical, managerial and financial) assessment using the criteria found in the *New Public Water System Capacity Planning Manual.*

(b) For all public water systems, the supplier must not begin construction of any new waterworks, make improvements to or modify existing waterworks, or begin using a new source until the supplier submits and receives Department approval of plans and specifications for such construction, improvements, modifications, or use.

(i) "BEGIN CONSTRUCTION" means initiation of the physical effort to construct a project, excluding engineering, architectural, legal, fiscal and economic investigations, studies, and completion of plans and specifications, and surveys. Physical effort includes, but is not limited to, site clearance, excavation, construction, or the establishment of an office or construction building on site.

(ii) "NEW WATERWORKS" means:

(A) Any newly constructed public water system; or

(B) An existing system that becomes, by definition, a public water system by extending its infrastructure through physical expansion by virtue of increasing the number of connections, the number of individuals served, or by extending the number of days of service.

(iii) For community water systems, a Professional Engineer registered in the State of Colorado must design all treatment systems.

(iv) Decisions regarding the review and approval of plans and specifications for new waterworks or improvements or modifications to existing waterworks shall be based on conformance to the design criteria developed by the Department specified in Policy DW-005, *State of Colorado Design Criteria for Potable Water Systems.*

(v) The Department shall grant approval upon finding that the proposed facilities conform to the design criteria specified in Policy DW-005, *State of Colorado Design Criteria for Potable Water Systems*, and are capable of continuously complying with all applicable laws, standards, rules and regulations.

11.4(2) Siting Requirements

Waterworks must avoid being located at a site which:

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

(b) Is within the floodplain of a 100-year flood, except for intake structures.[1]

(i) The Department shall not seek to override land use decisions affecting public water systems siting which are made at the local government level.

1 Records of the 100-year projections are available at the office of the Colorado Water Conservation Board, 1313 Sherman Street, Denver, Colorado 80203.

11.4(3) Department Review Procedures

(a) No later than 45 days after receiving a request for approval of a complete set of final plans and specifications for new waterworks or improvements or modifications to existing waterworks, the Department shall review the submitted documents and provide one of the following decisions in writing regarding the plans and specifications:

(i) Approval.

(ii) Conditional approval.

(A) If the supplier refuses to accept any conditions of a conditional approval, it constitutes a denial.

(iii) Denial, including the reason for the denial.

(iv) To place the review on hold and include a list of items which must be addressed by the responsible party before further action by the Department regarding review and approval.

(b) Approval of plans and specifications for new waterworks or improvements or modifications to existing waterworks expires one year from the date of written approval if the supplier has not begun construction.

(i) For expired approvals, if the supplier resubmits the previously approved plans and specifications to the Department for review and approval, the Department may reinstate an expired approval.

11.4(4) Procedures Upon Denial

If the Department denies approval of plans and specifications for new waterworks or improvements or modifications to existing waterworks, or if the supplier refuses to accept any conditions of a conditional approval, the supplier may request a hearing to contest the denial.

(a) Requests for a hearing must:

(i) Be filed in writing with the Department no later than 30 days after service of the statement of denial.

(ii) State the grounds on which the denial is being contested.

(iii) State the amount of time the supplier estimates will be required for the hearing.

(b) The hearing regarding the denial shall be held in accordance with applicable provisions of Article 4 of Title 24, Colorado Revised Statutes.

11.5 MONITORING PLAN RULE

11.5(1) Applicability

For all public water systems, the supplier must comply with the monitoring plan requirements specified in this rule.

11.5(2) General Requirements

(a) The supplier must develop and implement a monitoring plan which must ensure that the water quality monitoring performed by the supplier is representative of the water supplied to consumers and is consistent with regulatory requirements of the *Colorado Primary Drinking Water Regulations*.

(b) The supplier must maintain the monitoring plan and make it available for inspection by the Department.

11.5(3) Monitoring Plan Required Elements

(a) The supplier must include all of the following information in the monitoring plan:

(i) Part 1 - System Summary:

(A) The Colorado public water system identification number (PWSID).

(B) The full name of the supplier (e.g., the name of a corporation, LLC, partnership, sole proprietor, HOA, etc.).

(C) The system's mailing address.

(D) The name of the supplier's authorized contact person(s) responsible for the development and implementation of the monitoring plan, if other than the supplier.

(E) The telephone number of the supplier or the supplier's authorized monitoring plan contact person.

(F) The system's classification (i.e., community, non-transient, non-community, or transient, non-community).

(G) The total population supplied by the system, by population type (i.e., the number of resident, non-transient, and transient consumers).

(H) The physical addresses of all system facilities, including master meters, and the latitude and longitude of all facilities.

(I) The physical location of all records required under 11.36.

(ii) Part 2 - Water Sources Details:

(A) Identification of all water sources capable of being used by the system, (i.e., those connected by conveyances, whether currently producing or not).

(B) A schematic, diagram or sketch showing how the flow from each source is connected to the treatment processes and the distribution system.

(iii) Part 3 - Water Treatment Details:

(A) A summary of the system's operating characteristics.

(B) A schematic of the water treatment plant(s) identifying:

(I) All treatment processes, including all chemical feed points, and the associated periods of operation that were assumed in the design of the monitoring plan (e.g., use of peaking facilities, alternative water sources, maintenance schedules that take facilities offline, etc.).

(II) All treatment plant monitoring locations.

(iv) Part 4 - Distribution System Details:

(A) A schematic of the distribution system identifying all of the following:

(I) All entry points.

(II) All treatment facilities located after the entry point(s) (e.g., booster chlorination).

(III) All storage facilities and finished water reservoirs.

(IV) All distribution system sampling locations.

(V) All master meters to other public water systems.

(VI) All pump stations.

(v) Part 5 - Individual Rule Sampling Plans:

(A) For each applicable monitoring or sampling requirement:

(I) The frequency and approximate time of collection.

(II) The monitoring and sampling location identification and associated identification number.

(III) The justification for distribution system monitoring location selections and, if appropriate, the justification for all other monitoring and sampling location selections.

(IV) The sample preservation, quality assurance, and quality control procedures, including procedures for equipment calibration.

(V) The analysis procedure (i.e., certified laboratory or on-site by a Department-approved party).

(VI) The monitoring and sampling results presentation format.

(VII) Procedures to assess and report compliance status for MCLs, MRDLs, action levels, treatment techniques and, if applicable, disinfection byproduct precursor removal efficiency.

(VIII) A process to review and update the selected distribution system monitoring and sampling locations to account for changes due to growth or other significant changes to the distribution system.

(b) The supplier may use one schematic if it includes all elements specified in 11.5(3)(a)(ii-iv).

11.5(4) Monitoring Plan Reporting Requirements

(a) For new systems, the supplier must submit the information specified in 11.5(3)(a)(i-iv) to the Department no later than the 10th of the month following the end of the first quarter in which monitoring is required.

(i) For surface water systems supplying greater than (>) 3,300 people, the supplier must also submit a copy of the Individual Rule Sampling Plan for the following no later than the date the supplier collects the first sample: 11.23: Maximum Residual Disinfectant Levels Rule, 11.24: Disinfection Byproduct Precursors Rule, 11.25(2): Chlorite, and 11.25(3): Bromate.

(A) The Department may review and require the supplier to revise the sampling plan.

(b) The supplier must submit the Individual Rule Sampling Plan information specified in 11.5(3)(a)(v) to the Department as specified in the following rules: for integrated systems in 11.42(4), for the Disinfection Byproducts Rule in 11.25(1)(d), for the Groundwater Rule: Disinfection Waivers in 11.13(2), and for the Revised Total Coliform Rule in 11.16(3).

11.5(5) Monitoring Plan Revisions

The supplier must submit any changes to the monitoring plan no later than 30 days after the effective date of the change.

11.6 RESERVED

11.7 RESERVED

11.8 SURFACE WATER TREATMENT RULE

11.8(1) General Requirements

(a) Applicability and Definitions

(i) For all surface water systems, the supplier must comply with the requirements specified in this rule.

(ii) “COMBINED FILTER EFFLUENT” means a location representative of the filtered water quality which includes the filter effluent of all filters in use at any given time and is as close as practical to the point where all individual filter effluents combine or as approved by the Department.

(iii) “COMPREHENSIVE PERFORMANCE EVALUATION” or “CPE” means a thorough review and analysis of a treatment plant's performance capabilities and associated administrative, operational 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 CPE must include at least all of 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 whether a CTAP would improve treatment plant performance.

(iv) "COMPREHENSIVE TECHNICAL ASSISTANCE PROJECT" or "CTAP" means a performance improvement project that uses CPE results to set priorities for process control improvements and to establish a long-term training program for staff and administrators.

(v) "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.

(vi) "INDIVIDUAL FILTER EFFLUENT" means a location representative of the filtered water quality from an individual filter's effluent which is at a point before combining with the effluent flow from other filters.

(vii) "POINT OF DISINFECTANT APPLICATION" means the point where the disinfectant is applied and water downstream of that point is not subject to recontamination.

(b) Treatment Technique Requirements

(i) The supplier must provide filtration and disinfection of surface water sources that meets the treatment technique requirements for all of the following: *Cryptosporidium, Giardia lamblia*, viruses, Heterotrophic Plate Count bacteria, *Legionella*, and turbidity. These treatment techniques are as follows:

(A) At a point between where the source water is not subject to recontamination and the entry point, the supplier must install and properly operate water treatment processes that reliably achieve at least the following levels of treatment:

(I) 99 percent (2-log) removal of *Cryptosporidium.*

(II) 99.9 percent (3-log) treatment, including filtration and disinfection, of *Giardia lamblia.*

(III) 99.99 percent (4-log) treatment, including filtration and disinfection, of viruses.

(ii) The supplier is considered to be in compliance with the requirements specified in 11.8(1)(b)(i), if the supplier meets all of the following:

(A) The filtration requirements specified in 11.8(2)(b).

(B) The disinfection requirements specified in 11.8(3)(b).

(iii) Until March 31, 2016, the supplier must not use uncovered finished water storage facilities.

(A) "UNCOVERED FINISHED WATER STORAGE FACILITY" means, until March 31, 2016, a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and that is open to the atmosphere without properly screened vents, screened overflow pipe, or cover.

(iv) When the Department determines that a groundwater source is under the direct influence of surface water, and therefore the system is reclassified as a surface water system, the supplier must comply with the requirements specified in this section, 11.8(1)(b), no later than 18 months after receiving written notification from the Department of the source's reclassification.

11.8(2) Filtration Requirements

(a) Applicability for Filtration Requirements

(i) For all surface water systems, the supplier must comply with the requirements specified in this section, 11.8(2).

(b) Treatment Technique Requirements for the Combined Filter Effluent

(i) The combined filter effluent treatment technique requirements are as follows:

(A) At the combined filter effluent, the supplier must:

(I) Maintain treated water turbidity levels of less than or equal to (≤) the 95th percentile limit specified in Table 11.8-I in at least 95 percent of the turbidity monitoring results collected each month.

(a) For systems using slow sand filtration, the Department may allow an elevated turbidity level if the Department determines there is no significant interference with disinfection at the elevated turbidity limit for that system.

(II) Maintain treated water turbidity levels that are less than or equal to (≤) the maximum limit specified in Table 11.8-I at all times.

TABLE 11.8-I TURBIDITY LIMITS

For systems using:	95th percentile limit	Maximum limit
Conventional Filtration	0.3 NTU	1 NTU
Direct Filtration	0.3 NTU	1 NTU
Slow Sand Filtration	1 NTU	5 NTU
Diatomaceous Earth Filtration	1 NTU	5 NTU
Alternative Filtration Technologies - Bag Filtration	1 NTU	5 NTU
Alternative Filtration Technologies - Cartridge Filtration	1 NTU	5 NTU
Alternative Filtration Technologies - Membranes and all other alternative filtration	As approved by the Department, but no greater than 1 NTU	As approved by the Department, but no greater than 5 NTU

(ii) If approved by the Department, the supplier may use alternative filtration technologies including membrane filtration or filtration technologies other than those specified in Table 11.8-I.

(A) In order for the Department to approve an alternative filtration technology, the supplier must demonstrate, using pilot plant studies or other means, that the filtration technology, in combination with the disinfection treatment as specified in 11.8(3)(b), consistently achieves 99 percent (2-log) removal of *Cryptosporidium*, 99.9 percent (3-log) removal and inactivation of *Giardia lamblia*, 99.99 percent (4-log) removal and inactivation of viruses.

(B) If the Department approves the use of an alternative filtration technology, the Department shall approve combined filter effluent turbidity limits that are less than or equal to (≤):

(I) 1 NTU in 95 percent of measurements collected each month; and

(II) 5 NTU at any time.

(iii) When the Department determines that a groundwater source is under the direct influence of surface water, and therefore the system is reclassified as a surface water system, the supplier must comply with the requirements specified in this section, 11.8(2)(b), no later than 18 months after receiving written notification from the Department of the source's reclassification.

(c) Monitoring Requirements for Combined Filter Effluent Treatment Technique Requirements

(i) To determine compliance with the combined filter effluent treatment technique requirements, the supplier must monitor turbidity at least every four hours at a location(s) representative of the combined filter effluent.

(A) The supplier may monitor turbidity continuously if the supplier validates the continuous monitoring equipment for accuracy at a Department-approved regular frequency and using a Department-approved protocol.

(B) The Department may reduce the turbidity monitoring frequency to daily if the Department determines that less frequent monitoring is sufficient to indicate effective filtration performance for systems that meet one or more of the following:

(I) The system uses filtration treatment other than conventional filtration treatment, direct filtration, or diatomaceous earth filtration.

(II) The system supplies less than or equal to (≤) 500 people.

(ii) For systems using lime softening, the supplier may acidify turbidity samples before analysis using a Department-approved protocol.

(iii) When the Department determines that a groundwater source is under the direct influence of surface water, and therefore the system is reclassified as a surface water system, the supplier must comply with the requirements specified in this section, 11.8(2)(c), no later than when filtration is installed.

(d) Treatment Technique Violations for Combined Filter Effluent

(i) The following constitute combined filter effluent treatment technique violations:

(A) More than 5 percent of turbidity monitoring results in any month are greater than (>) the applicable 95th percentile limits specified in Table 11.8-I.

(B) At any time a turbidity monitoring result is greater than (>) the applicable maximum turbidity limit specified in Table 11.8-I.

(e) Response to Combined Filter Effluent Treatment Technique Violations

(i) In the event of a 95th percentile combined filter effluent turbidity limit treatment technique violation, as specified in 11.8(2)(d)(i)(A), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(ii) In the event of a maximum combined filter effluent turbidity limit treatment technique violation, as specified in 11.8(2)(d)(i)(B), the supplier must consult with the Department as soon as possible but no later than 24 hours after the violation occurs.

(A) The Department shall determine from the consultation whether Tier 1 or Tier 2 public notice is required to protect public health. The supplier must distribute public notice as specified by the Department.

(B) If the supplier fails to consult with the Department within 24 hours, the supplier must distribute Tier 1 public notice, as specified in 11.33, for the violation.

(f) Reporting Requirements for Combined Filter Effluent Monitoring

(i) For combined filter effluent turbidity monitoring results collected under 11.8(2)(c), the supplier must submit the following information no later than the 10th of the following month:

(A) Number of combined filter effluent turbidity monitoring results recorded during the month.

(B) Number and percentage of combined filter effluent turbidity monitoring results recorded during the month that were greater than (>) the 95th percentile turbidity limit specified in 11.8(2)(b).

(C) The date and value of any combined filter effluent turbidity monitoring results collected during the month, which were greater than (>) the maximum turbidity limit.

(g) Monitoring Requirements for Individual Filter Effluent Turbidity

(i) For systems using conventional filtration treatment or direct filtration treatment, the supplier must monitor turbidity continuously at locations representative of each individual filter effluent.

(A) The supplier must record the individual filter effluent turbidity monitoring results at least every 15 minutes.

(B) The supplier must calibrate the continuous monitoring equipment using the manufacturer-specified procedure.

(C) If there is a failure of the continuous monitoring equipment, the supplier must monitor the individual filter effluent turbidity by collecting a grab sample no later than four hours after the last recorded monitoring result and continue collecting grab samples every four hours until the continuous monitoring equipment is returned to service.

(I) For systems supplying greater than or equal to (≥) 10,000 people, the supplier must resume continuous individual filter effluent turbidity monitoring no later than five working days after the equipment failure.

(II) For systems supplying less than (<) 10,000 people, the supplier must resume continuous individual filter effluent turbidity monitoring no later than 14 days after the equipment failure.

(D) For systems supplying less than (<) 10,000 people that consist of two or fewer filters, the supplier may conduct continuous combined filter effluent turbidity monitoring to represent individual filter effluent turbidity monitoring.

(I) Continuous combined filter effluent turbidity monitoring must meet the requirements specified in 11.8(2)(g)(i)(A-C).

(E) For systems using lime softening, the supplier may acidify turbidity samples before analysis using a Department-approved protocol.

(h) Reporting Requirements for Individual Filter Effluent Turbidity Monitoring

For individual filter effluent turbidity monitoring, the supplier must submit documentation that the monitoring was conducted, no later than the 10th of the following month in which the monitoring was conducted.

(i) Response to Individual Filter Effluent Turbidity Monitoring Results for Systems Supplying Greater Than or Equal to (≥) 10,000 People

(i) If the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 1.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs and the supplier must:

(A) Produce a filter profile no later than seven days after the exceedance if the cause for the exceedance is not known.

(B) Submit all of the following no later than the 10th of the month following the exceedance:

(I) Which filter exceeded.

(II) Date of the exceedance.

(III) The turbidity monitoring results which exceeded 1.0 NTU.

(IV) The cause for the exceedance or if the cause of the exceedance is not known, documentation that a filter profile was produced.

(ii) If, in each month, for three consecutive months, the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 1.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs.

(A) The supplier must conduct a self-assessment of that filter no later than 14 days after the exceedance.

(B) The self-assessment must include at least all of the following:

(I) Assessment of filter performance.

(II) Development of a filter profile.

(III) Identification and prioritization of factors limiting filter performance.

(IV) Assessment of the applicability of corrections.

(V) Preparation of a written self-assessment report.

(C) In addition to the reporting requirements specified in 11.8(2)(i)(i)(B), the supplier must submit notification by the 10th of the month following the exceedance that the self-assessment was conducted.

(iii) If, in each month, for two consecutive months, the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 2.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs.

(A) The supplier must comply with the reporting requirements specified in 11.8(2)(i)(i)(B).

(B) No later than 30 days after the exceedance occurs, the supplier must arrange for a CPE to be conducted by the Department or by a Department-approved third party.

(C) No later than 90 days after the exceedance occurs, the supplier must submit the completed CPE report.

(D) If the CPE indicates the potential for improved water system performance, the supplier must complete a CTAP.

(I) During the CTAP, the supplier must identify and systematically address plant-specific factors as outlined in the CPE and include them in a report submitted no later than 90 days after the completion of the CPE.

(iv) When a filter is brought online, if after the first four hours of operation, the individual filter effluent turbidity monitoring results at that filter are greater than (>) 0.5 NTU in two consecutive readings collected 15 minutes apart, an exceedance occurs and the supplier must:

(A) Produce a filter profile no later than seven days after the exceedance if the cause for the exceedance is not known.

(B) Submit all of the following no later than the 10th of the month following the exceedance:

(I) Which filter exceeded.

(II) Date of the exceedance.

(III) The turbidity monitoring results which exceeded 0.5 NTU.

(IV) The cause for the exceedance or if the cause of the exceedance is not known, documentation that a filter profile was produced.

(v) For systems using lime softening, the supplier may apply to the Department for higher individual filter effluent turbidity limits than the limits specified in this section, 11.8(2)(i), if the supplier can demonstrate that higher individual filter effluent limits are due only to lime carryover and not degraded filter performance.

(j) Response to Individual Filter Effluent Turbidity Monitoring Results for Systems Supplying Less Than (<) 10,000 People

(i) If the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 1.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs and the supplier must submit all of the following no later than the 10th of the month following the exceedance:

(A) Which filter exceeded.

(B) Date of the exceedance.

(C) Turbidity monitoring results which exceeded 1.0 NTU.

(D) Cause for the exceedance, if known.

(ii) If, in each month, for three consecutive months the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 1.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs.

(A) The supplier must conduct a self-assessment of that filter no later than 14 days after the exceedance occurs, unless a CPE is required as specified in 11.8(2)(j)(iii).

(I) For systems with two or fewer filters that monitor combined filter effluent instead of individual filter effluent as specified in 11.8(2)(g)(i)(D), the supplier must conduct the self-assessment on both filters.

(B) The self-assessment must include at least all of the following:

(I) Assessment of filter performance.

(II) Development of a filter profile.

(III) Identification and prioritization of factors limiting filter performance.

(IV) Assessment of the applicability of corrections.

(V) Preparation of a written self-assessment report.

(C) In addition to the reporting requirements specified in 11.8(2)(j)(i), the supplier must submit all of the following no later than the 10th of the month following the exceedance:

(I) The date the self-assessment was triggered.

(II) The date the self-assessment was completed.

(iii) If, in each month, for two consecutive months, the individual filter effluent turbidity monitoring results at the same filter are greater than (>) 2.0 NTU in two consecutive recordings collected 15 minutes apart, an exceedance occurs.

(A) No later than 60 days after the exceedance occurs, the supplier must arrange for a CPE to be conducted by the Department or by a Department-approved third party.

(B) No later than 120 days after the exceedance occurs, the supplier must submit the completed CPE report.

(C) The supplier is not required to arrange for a CPE and submit a CPE report if:

(I) A CPE has been completed by the Department or by a Department-approved third party within the last 12 months; or

(II) The supplier and Department are participating in an ongoing CTAP at the system.

(D) In addition to the reporting requirements specified in 11.8(2)(j)(i), if a CPE is required, the supplier must submit all of the following no later than the 10th of the month following the exceedance:

(I) That a CPE is required.

(II) The date the CPE was triggered.

(E) If the CPE indicates the potential for improved water system performance, the supplier must complete a CTAP.

(I) During the CTAP, the supplier must identify and systematically address plant-specific factors as outlined in the CPE and include them in a report submitted no later than 90 days after the completion of the CPE.

(iv) For systems using lime softening, the supplier may apply to the Department for higher individual filter effluent turbidity limits than the limits specified in this section, 11.8(2)(j), if the supplier can demonstrate that higher individual filter effluent turbidity limits are due only to lime carryover and not due to degraded filter performance.

11.8(3) Disinfection Treatment Technique Requirements

(a) Applicability for Disinfection Treatment Technique Requirements

(i) For all surface water systems, the supplier must comply with the disinfection treatment technique requirements specified in this section, 11.8(3).

(ii) When the Department determines that a groundwater source is under the direct influence of surface water, and therefore the system is reclassified as a surface water system, the supplier must comply with all of the following:

(A) Either Department-determined interim disinfection requirements or disinfection treatment technique requirements specified in 11.8(3)(b), no later than 60 days after written notification from the Department of the decision to change the source's classification; and

(B) All requirements specified in this section, 11.8(3), no later 18 months after written notification from the Department of the decision to change the source's classification or no later than when the filtration is installed, whichever is sooner.

(b) Treatment Technique Requirements for Disinfection

(i) The disinfection treatment technique requirements are as follows:

(A) The supplier must maintain disinfection treatment sufficient to ensure that the total treatment processes, including filtration and disinfection, achieve 99.9 percent (3-log) treatment of *Giardia lamblia* cysts and 99.99 percent (4-log) treatment of viruses, as determined by the Department.

(B) The supplier must maintain a residual disinfectant concentration at each entry point and throughout the distribution system.

(I) At each entry point, the residual disinfectant concentration cannot be less than (<) 0.2 mg/L for more than four hours.

(II) In the distribution system, the residual disinfectant concentration cannot be undetectable in more than 5 percent of the samples collected in each month, for two consecutive months during which the system supplies water to the public.

(III) In the distribution system, the residual disinfectant concentration must be greater than or equal to (≥) 0.2 mg/L.

(ii) No later than December 31, 2015, the supplier may apply to the Department for an extension for complying with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).

(A) In the application, the supplier must include all of the following information:

(I) An explanation of why the supplier is unable to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).

(II) A distribution system disinfectant residual data analysis demonstrating the inability to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).

(III) An engineering report prepared by a professional engineer registered in the state of Colorado demonstrating that capital improvements are necessary to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(III).

(IV) A proposed schedule for completing the system modifications.

(B) The Department shall consider the following criteria when determining if an extension will be granted:

(I) The supplier submitted a complete application that included the information specified above;

(II) The supplier has complied with the monitoring requirements specified in 11.17 in the last 36 months; and

(III) The supplier has not incurred an MCL violation specified in 11.17(9) in the last 36 months.

(iii) The Department will only grant an extension for up to four years.

(iv) If the supplier receives written Department-approval for an extension, the supplier must:

(A) Continue to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(B)(II) and is subject to the violation specified in 11.8(3)(d)(i)(B) until the capital improvements are completed or the extension expires, whichever comes first; and

(B) Comply with any Department-specified requirements.

(c) Monitoring Requirements for Disinfection Treatment Technique Requirements

(i) To determine compliance with the disinfection treatment technique requirements, the supplier must monitor the residual disinfectant concentration.

(A) At each entry point, the supplier must continuously monitor the residual disinfectant concentration.

(I) The supplier must record the lowest monitoring result each day.

(II) If there is a failure of the continuous monitoring equipment, the supplier must monitor the residual disinfectant concentration by collecting a grab sample no later than four hours after the equipment failure and continue collecting grab samples every four hours until the continuous monitoring equipment is returned to service.

(a) The supplier must resume continuous residual disinfectant concentration monitoring no later than five working days after the equipment failure.

(III) For systems supplying less than or equal to (≤) 3,300 people, the supplier is not required to monitor continuously if the supplier collects grab samples at the frequency specified in Table 11.8-II.

(a) If more than one sample per day is required, the supplier must collect the samples throughout the day. The sampling intervals are subject to Department approval.

(b) If any grab sample result is less than (<) 0.2 mg/L, the supplier must increase the monitoring frequency of the residual disinfectant concentration at that entry point to at least every four hours until the residual disinfectant concentration is greater than or equal to (≥) 0.2 mg/L.

TABLE 11.8-II MINIMUM GRAB SAMPLES	
Population supplied by the system	Samples per day
≤ 500	1
501 – 1,000	2
1,001 – 2,500	3
2,501 – 3,300	4

(B) In the distribution system, the supplier must monitor the residual disinfectant concentration at the same time and at the same sampling locations that total coliform samples are collected under 11.16(4).

(I) The supplier must measure the residual disinfectant concentration as free chlorine unless the supplier uses a disinfection process that results in a monochloramine residual disinfectant, then the supplier must measure the residual disinfectant concentration as total chlorine. If the supplier uses a different type of chemical disinfectant (e.g., ozone or chlorine dioxide), the supplier must measure the appropriate residual disinfectant concentration.

(II) For systems using both surface water and groundwater sources, the Department may allow the supplier to collect residual disinfectant concentration samples at locations other than the total coliform sampling locations if the Department determines that other locations are more representative of finished water quality in the distribution system.

(III) A supplier may monitor for heterotrophic bacteria, measured as Heterotrophic Plate Count (HPC), instead of disinfectant residual, pursuant to 11.8(3)(g).

(d) Treatment Technique Violations for Disinfection

(i) The following constitute disinfection treatment technique violations:

(A) At any entry point, the residual disinfectant concentration is less than (<) 0.2 mg/L for more than four hours.

(B) In the distribution system, the residual disinfectant concentration is not detectable in more than 5 percent of the samples collected in each month, for two consecutive months that the system supplies water to the public.

(I) If the Department grants an extension under 11.8(3)(b)(ii), the supplier is subject to this violation after March 31, 2016 and until capital improvements are completed or the extension expires, whichever comes first.

(C) In the distribution system:

(I) If the supplier collects greater than or equal to (≥) 40 residual disinfectant concentration samples per month, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than 5 percent of the samples collected.

(II) If the supplier collects greater than (>) one but less than (<) 40 residual disinfectant concentration samples per monitoring period, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than one sample collected.

(III) If the supplier collects greater than (>) one but less than (<) 40 residual disinfectant concentration samples per monitoring period, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than 5 percent of the samples collected in each month for two consecutive months that the system supplies water to the public.

(IV) If the supplier collects only one residual disinfectant concentration sample per monitoring period, the residual disinfectant concentration is less than (<) 0.2 mg/L.

(D) Any time the supplier fails to comply with the treatment technique requirements specified in 11.8(3)(b)(i)(A).

(e) Response to Disinfection Treatment Technique Violations

(i) In the event of an entry point disinfection treatment technique violation as specified in 11.8(3)(d)(i)(A), the supplier must:

(A) Notify the Department no later than the end of the next business day.

(B) Distribute Tier 2 public notice as specified in 11.33.

(ii) In the event of a disinfection treatment technique violation as specified in 11.8(3)(d)(i)(B-D), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(f) Reporting Requirements for Disinfection Monitoring

(i) If at any time the entry point residual disinfectant concentration is less than (<) 0.2 mg/L, the supplier must notify the Department as soon as possible but no later than the end of the next business day.

(A) The supplier must also report, no later than the end of the next business day, whether the entry point residual disinfectant concentration was restored to at least 0.2 mg/L within four hours.

(ii) For residual disinfectant concentration samples collected under 11.8(3)(c), the supplier must submit all of the following information no later than the 10th of the following month:

(A) For each entry point, the lowest daily residual disinfectant concentration result in mg/L.

(B) The date and duration of each period when the entry point residual disinfectant concentration fell below 0.2 mg/L and when the Department was notified of the occurrence.

(C) For distribution system residual disinfectant concentration samples:

(I) The number of sample results that were less than (<) 0.2 mg/L.

(II) The percentage of sample results that were less than (<) 0.2 mg/L for each of the last two months.

(g) Monitoring Requirements for Alternative Disinfection- Heterotrophic Bacteria

(i) In the distribution system, the supplier may monitor for heterotrophic bacteria, measured as Heterotrophic Plate Count (HPC), instead of residual disinfectant concentration, pursuant to 11.8(3)(c).

(A) If the supplier is monitoring for heterotrophic bacteria instead of residual disinfectant concentration, the samples must be analyzed under 11.46(2)(f). Heterotrophic bacteria concentrations less than or equal to (≤) 500 CFU/ml are considered to have a detectable residual disinfectant concentration for purposes of determining compliance with the treatment technique requirement specified in 11.8(3)(b)(i)(B)(II) and must be included with the reporting requirements specified in 11.8(3)(f)(ii)(C).

(B) If the supplier is monitoring for heterotrophic bacteria, the supplier is not required to comply with the requirements for the distribution system residual disinfectant concentration specified in this section, 11.8(3) if the Department determines that the supplier meets all of the following criteria:

(I) Providing adequate disinfection in the distribution system.

(II) Not capable of having a sample transported and analyzed for HPC by a certified laboratory within the required time and temperature conditions specified by approved analytical methods.

11.8(4) Disinfection Profiling

The purpose of disinfection profiling and benchmarking is to allow the supplier and the Department to assess whether a change in disinfection practices creates a microbial risk. The supplier must develop a disinfection profile, calculate a benchmark (lowest monthly inactivation) based on the profile, and consult with the Department before making a significant change to disinfection.

(a) Applicability and Definitions for Disinfection Profiling

(i) For new surface water systems or reclassified systems that now meet the applicability of this rule, applicability for this section, 11.8(4), is determined by evaluating TTHM and HAA5 sample results. Applicability must be determined no later than 12 months after the system is classified as a surface water system.

(A) The supplier must collect TTHM and HAA5 samples that meet the routine sampling requirements specified in 11.25(1)(c) and submit the results to the Department. Alternatively, the supplier may:

(I) Request that the Department approve the use of a more appropriate data set for determination of applicability; or

(II) Choose not to collect the TTHM and HAA5 data, if the supplier notifies the Department of the decision. The supplier must then develop a disinfection profile to determine log inactivation of *Giardia lamblia* under 11.8(4)(a)(i)(B).

(B) The supplier must comply with the treatment technique requirement to develop a disinfection profile to determine log inactivation of *Giardia lamblia* if the system meets either of the following criteria:

(I) A system supplying greater than or equal to (≥) 10,000 people and has a TTHM annual average of quarterly samples greater than or equal to (≥) 0.064 mg/L or has an HAA5 annual average of quarterly samples greater than or equal to (≥) 0.048 mg/L.

(II) A community or non-transient, non-community water systems supplying less than (<) 10,000 people and has a TTHM sample result greater than or equal to (≥) 0.064 mg/L or has an HAA5 sample result greater than or equal to (≥) 0.048 mg/L.

(C) For systems that use chloramines, ozone, or chlorine dioxide that meet the criteria specified in 11.8(4)(a)(i)(B), the supplier must also develop a disinfection profile to determine log inactivation of viruses.

(ii) If a supplier plans to make a significant change in disinfection practices, the supplier must comply with the treatment technique requirement to develop a disinfection profile to determine log inactivation of *Giardia lamblia* and log inactivation of viruses before making the change.

(iii) "DISINFECTION PROFILE" means the graphical representation of a system's microbial inactivation over 12 consecutive months.

(iv) "SIGNIFICANT CHANGES IN DISINFECTION PRACTICE" means one or more of the following:

(A) Changes to the point of disinfection.

(B) Changes to the disinfectant(s) used in the treatment plant.

(C) Changes to the disinfection process.

(D) Any other modification identified by the Department.

(b) Monitoring Requirements for Disinfection Profiling

(i) To determine the log inactivation ratio(s) for each disinfection segment before the distribution system, the supplier must monitor the following set of parameters during daily peak hourly flow:

(A) The residual disinfectant concentration(s) (C) at each entry point.

(I) For systems with one point of disinfectant application and multiple disinfection segments, the supplier must also monitor before each sequential segment of disinfection.

(II) For systems with multiple points of disinfectant application, the supplier must also monitor before each additional point of disinfectant application.

(B) The temperature of the disinfected water at each residual disinfectant concentration sampling location or at an alternative Department-approved location(s).

(C) For systems using chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling location or at an alternative Department-approved location(s).

(D) System-specific parameters to determine the disinfectant contact time(s) (T).

(ii) The supplier must monitor the set of parameters specified in 11.8(4)(b)(i) at the following frequencies:

(A) For systems meeting the criteria as specified in 11.8(4)(a)(i)(B)(I), at least daily for 12 consecutive months.

(B) For systems meeting the criteria as specified in 11.8(4)(a)(i)(B)(II) or 11.8(4)(a)(ii), at least weekly on the same calendar day for 12 consecutive months.

(C) For seasonal systems, at the frequency specified above in 11.8(4)(b)(ii)(A) or 11.8(4)(b)(ii)(B) only when the system operates.

(D) If the supplier monitors more frequently than required, the monitoring frequency must be evenly spaced.

(iii) For systems meeting the criteria specified in 11.8(4)(a)(ii) the supplier is not required to conduct monitoring as specified in 11.8(4)(b)(i-ii), if the system meets one of the following criteria:

(A) If the supplier has at least one year of existing data that are substantially equivalent to the data set required under 11.8(4)(b)(i-ii), the supplier may use this data to develop a disinfection profile(s), with the all of the following conditions:

(I) If the supplier has made a significant change to treatment practices or changed sources since the data was collected, the supplier must not use previously collected data.

(II) The supplier may develop a disinfection profile(s) using up to three years of existing data.

(B) If the supplier was required to develop a disinfection profile as specified in 11.8(4)(a)(i)(B), the supplier may use the previously developed disinfection profile(s) and is not required to develop a new disinfection profile, with all of the following conditions:

(I) If the supplier has made a significant change to treatment practices or changed sources since the disinfection profile(s) was developed, the supplier must not use a previously developed disinfection profile(s).

(II) If a virus disinfection profile(s) was not previously developed, the supplier must develop a virus disinfection profile(s) using the same monitoring data on which the *Giardia lamblia* disinfection profile(s) is based.

(c) Disinfection Profiling Calculations

(i) For each set of parameters collected under 11.8(4)(b), the supplier must calculate total inactivation ratio(s) and total logs of inactivation for *Giardia lamblia* based on the $CT_{99.9}$ values in 11.46 as follows:

(A) The supplier must determine the total inactivation ratio as follows:

Inactivation ratio is equal to: $(CT_{calc} / CT_{99.9})$.

(I) For a supplier monitoring at a single location, calculate one inactivation ratio.

(II) For a supplier monitoring at multiple locations:

(a) Determine the inactivation ratio value for each segment.

(b) Add all inactivation ratio values to determine the total inactivation ratio: $(\sum (CT_{calc} / CT_{99.9}))$.

(B) The supplier must determine the total logs of inactivation by multiplying the total inactivation ratio by 3.0.

Total logs of inactivation is equal to: $3.0 \times \sum (CT_{calc} / CT_{99.9})$.

(ii) If the supplier is required to calculate the logs of inactivation for viruses as specified in 11.8(4)(a)(i)(C) or 11.8(4)(a)(ii), the supplier must use a Department-approved calculation method.

(iii) The supplier must maintain disinfection profile data in graphic form, as a spreadsheet, or in a Department-accepted format for review as part of sanitary surveys.

(d) Treatment Technique Violations and Response for Disinfection Profiling

(i) If the supplier fails to comply with the requirements specified in this section, 11.8(4), a disinfection profiling treatment technique violation occurs.

(ii) In the event of a disinfection profile treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

11.8(5) Disinfection Benchmarking

(a) Applicability and Definitions for Disinfection Benchmarking

(i) If the supplier was required to develop a disinfection profile for *Giardia lamblia* and/or viruses as specified in 11.8(4) and plans to make a significant change in disinfection practices, as defined in 11.8(4)(a)(iv), the supplier must comply with all of the following treatment technique requirements before making the change:

(A) Calculate a disinfection benchmark for each profile developed under 11.8(4)(c).

(B) Consult with the Department.

(ii) "DISINFECTION BENCHMARK" means the lowest monthly average of total log inactivation values calculated in the disinfection profile. The disinfection benchmark is used as a baseline of inactivation when considering changes in the disinfection process.

(b) Disinfection Benchmarking Calculations

(i) The supplier must calculate a disinfection benchmark as follows:

(A) Calculate the average log inactivation for each month using the total logs of inactivation value(s) calculated in the disinfection profile developed under 11.8(4)(c).

(B) If the supplier has collected one year of data, the lowest monthly average log inactivation value is the disinfection benchmark.

(C) If the supplier has collected more than one year of data, the average of the lowest monthly average log inactivation value for each calendar year is the disinfection benchmark.

(c) Reporting Requirements for Department Consultation

(i) The supplier must submit all of the following information as part of the consultation process:

(A) A description of the proposed change in disinfection practice.

(B) The disinfection profile and benchmark for *Giardia lamblia*.

(C) If required to be developed, the disinfection profile and benchmark for viruses.

(D) An analysis of how the proposed change will affect the current levels of disinfection.

(E) Any additional information requested by the Department.

(d) Treatment Technique Violations and Response for Disinfection Benchmarking

(i) If the supplier fails to comply with the requirements specified in this section, 11.8(5), a disinfection benchmarking treatment technique violation occurs.

(ii) In the event of a disinfection benchmark treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

11.9 SURFACE WATER TREATMENT RULE: FILTER BACKWASH RECYCLE RULE

11.9(1) Applicability and Definitions

(a) For all surface water systems that use conventional filtration treatment or direct filtration treatment and that also recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes, the supplier must comply with the requirements specified in this rule.

(b) “LIQUIDS FROM DEWATERING PROCESSES” means a stream of liquids generated from a unit used to concentrate solids for disposal. Processes may consist of centrifuges, filter presses, belt presses, vacuum filters, monofills, or other sludge concentrating equipment. Such equipment may be used to dewater sludge from treatment units used in recycling processes or sludge from units found in the primary processes.

(c) "THICKENER SUPERNATANT" means a stream of liquids containing the decant from a sedimentation basin, clarifier or other unit that is used to treat water, solids, or semi-solids from the primary treatment processes. The "clear water" that exits the units after particles have been allowed to settle out is thickener supernatant (or sludge thickener supernatant).

11.9(2) Treatment Technique Requirement for Filter Backwash Recycle

The supplier must return recycled spent filter backwash water, thickener supernatant, or liquids from dewatering processes to a location within the treatment process that is before the conventional filtration treatment or direct filtration treatment or to an alternative Department-approved location.

11.9(3) Information Collection Requirements for Filter Backwash Recycle

The supplier must collect all of the following information about the recycle flow(s):

(a) A list of all recycle flows and the frequency with which they are returned.

(b) The average and maximum backwash flow rate through the filters.

(c) The average and maximum duration of the filter backwash process in minutes.

(d) The typical filter run length and a written summary of how filter run length is determined.

(e) The type of treatment provided for the recycle flow(s).

(f) If applicable, data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used, including the average dose and frequency of use, and frequency at which solids are removed.

11.9(4) Reporting Requirements for Filter Backwash Recycle

No later than 18 months after meeting the applicability of this rule, the supplier must provide the Department with written notification that includes all of the following:

(a) A plant schematic showing all of the following:

(i) The origin of all flows which are recycled.

(ii) The hydraulic conveyance used to transport the flows.

(iii) The location where the flows are re-introduced into the treatment plant.

(b) Typical recycle flow in gallons per minute.

(c) The highest observed plant flow experienced in the previous year in gallons per minute.

(d) Design flow for the treatment plant in gallons per minute.

(e) Department-approved operating capacity for the plant.

11.10 SURFACE WATER TREATMENT RULE: ENHANCED TREATMENT FOR CRYPTOSPORIDIUM

11.10(1) Applicability and Definitions

(a) For all surface water systems with their own surface water sources, the supplier must comply with the requirements specified in this rule.

(i) For wholesale systems and consecutive systems, the wholesaler and, if required, the supplier responsible for the consecutive system must comply with the requirements specified in this rule based on the population of the largest system in the combined distribution system.

(b) The requirements specified in this rule expand on the treatment technique requirements for *Cryptosporidium* in 11.8.

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

(d) "TWO-STAGE LIME SOFTENING" means a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

11.10(2) Source Water Monitoring Requirements

(a) General Source Water Monitoring Requirements

(i) The supplier must conduct two rounds of source water monitoring for each treatment plant to determine what level, if any, of additional *Cryptosporidium* treatment the supplier must provide.

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the supplier must conduct an initial round of source water monitoring and begin the monitoring according to a Department-approved schedule.

(A) For systems supplying greater than or equal to (≥) 10,000 people, the supplier must sample all surface water sources for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 consecutive months.

(B) For systems supplying less than (<) 10,000 people, the supplier must sample all surface water sources for *E. coli* at least once every two weeks for 12 consecutive months.

(I) The supplier may conduct *Cryptosporidium* monitoring as specified in 11.10(2)(a)(ii)(C) instead of conducting *E. coli* monitoring if the supplier notifies the Department no later than three months before the date the supplier is required to begin *E. coli* monitoring as specified in Table 11.10-I.

(II) The supplier may use an indicator other than *E. coli* if the supplier receives written Department-approval that includes the basis for the Department's determination that the alternative indicator will more accurately identify whether the source water requires additional treatment.

(C) For systems supplying less than (<) 10,000 people, the supplier must sample all surface water sources for *Cryptosporidium* if one of the following conditions are met:

(I) The supplier chooses to conduct *Cryptosporidium* monitoring instead of *E. coli* monitoring as specified in 11.10(2)(a)(ii)(B)(I).

(II) Based on monitoring conducted under 11.10(2)(a)(ii)(B), the annual average *E. coli* concentration is greater than (>) 100 *E. coli* MPN/100 ml or CFU/100 ml.

(a) The supplier may use an alternative annual average *E. coli* concentration if the supplier receives written Department-approval that includes the basis for the Department's determination that the alternative annual average *E. coli* concentration will more accurately identify whether the source water requires additional treatment.

(D) If the supplier is required to conduct source water monitoring for *Cryptosporidium* under 11.10(2)(a)(ii)(C), the supplier must choose to either monitor at least twice each month for 12 consecutive months or at least monthly for 24 consecutive months.

(E) The supplier may sample more frequently than required if the sampling frequency is evenly spaced throughout the monitoring period.

(iii) The supplier must conduct a second round of source water monitoring that meets the same requirements as the initial round of source water monitoring. The supplier must begin monitoring no later than the month and year specified in Table 11.10-I.

TABLE 11.10-I SOURCE WATER MONITORING START DATES

	For systems that:	If the initial round of source water monitoring was required no later than:	The supplier must begin the second round of source water monitoring no later than:
Schedule 1	Supply at least 100,000 people	October 2006	April 2015
Schedule 2	Supply from 50,000 to 99,999 people	April 2007	October 2015
Schedule 3	Supply from 10,000 to 49,999 people	April 2008	October 2016
Schedule 4	Supply less than 10,000 people and only monitor for *E. coli*	October 2008	October 2017
Schedule 4	Supply less than 10,000 people and monitor for *Cryptosporidium*	April 2010	April 2019
Schedule 5	Are on a Department-approved schedule	As approved by the Department	Six years following the bin classification of the initial round

(iv) For systems or treatment plants that operate for only part of the year, the supplier must conduct source water monitoring as specified in this section, 11.10(2)(a), with the following modifications:

(A) The supplier must conduct source water monitoring only during the months that the treatment plant operates unless the Department specifies another monitoring period based on plant operating practices.

(B) If a treatment plant operates fewer than six months per year and the supplier monitors for *Cryptosporidium*, the supplier must collect at least six *Cryptosporidium* source water monitoring samples in each of the two consecutive 12-month periods of the 24-month monitoring period.

(I) The supplier must collect source water samples at a frequency that is evenly spaced throughout the period that the plant operates.

(v) The supplier is not required to conduct source water monitoring if the supplier will provide a total of at least 5.5-log treatment for *Cryptosporidium*, equivalent to meeting the treatment requirements of a Bin 4 classification as specified in 11.10(4)(a).

(A) If the supplier chooses to provide at least 5.5-log treatment for *Cryptosporidium* instead of conducting source water monitoring, the supplier must notify the Department in writing no later than three months before the month the supplier is required to begin monitoring in as specified in Table 11.10-I.

(B) The supplier may choose to stop source water monitoring at any time after beginning the monitoring if the supplier notifies the Department in writing that it will provide at least 5.5-log treatment for *Cryptosporidium*.

(C) The supplier must install and operate technologies to provide at least 5.5-log of treatment for *Cryptosporidium* no later than the applicable treatment compliance date specified in 11.10(4)(a).

(b) Source Water Monitoring Schedules

(i) The supplier must submit a monitoring schedule that specifies the calendar dates for the collection of each required sample.

(A) For each round of monitoring, the supplier must submit the monitoring schedule no later than three months before the applicable start date specified in Table 11.10-I.

(B) If the Department does not respond to the supplier regarding the monitoring schedule by the beginning date of the schedule, the supplier must sample as specified in the submitted schedule.

(ii) The supplier must collect source water monitoring samples no earlier than two days before and no later than two days after the dates specified in the monitoring schedule (i.e., within a five-day period) unless one of the following conditions applies:

(A) If an extreme condition or situation exists that may pose a danger to the supplier or that cannot be avoided and causes the supplier to be unable to sample in the scheduled five-day period, the supplier must:

(I) Sample as close to the scheduled date as possible unless the Department approves an alternative replacement sampling date.

(II) Submit an explanation for the delayed sample to the Department at the same time the sample is sent to the laboratory.

(B) If the supplier is unable to report a valid analytical sample 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); or the failure of an approved laboratory to analyze the sample, then the supplier must:

(I) Collect a replacement sample no later than 21 days after receiving notification from the laboratory that a sample result cannot be reported for the scheduled date unless one or more of the following conditions are met:

(a) The supplier demonstrates that collecting a replacement sample within this time frame is not feasible.

(b) The Department approves an alternative replacement sampling date.

(II) Submit an explanation for the delayed sample to the Department at the same time the replacement sample is sent to the laboratory.

(iii) If the supplier fails to collect any source water monitoring sample within the five-day period for any reason other than those specified in 11.10(2)(b)(ii)(A-B), the supplier must revise the monitoring schedule to reschedule all missed samples. The supplier must submit the revised monitoring schedule to the Department for approval before collecting the missed samples.

(c) Source Water Monitoring Sampling Locations

(i) For each round of monitoring, the supplier must submit a description of the sampling location(s) no later than three months before the applicable start date specified in Table 11.10-I.

(A) The description must address the site of the sampling location(s) in relation to the water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle.

(B) If the Department does not respond to the supplier regarding the sampling location(s) by the beginning date of the monitoring schedule, the supplier must sample at the submitted sampling location(s).

(ii) The supplier must collect source water monitoring samples before each treatment plant that treats a surface water source.

(A) If multiple treatment plants draw water from the same influent, such as the same pipe or intake, the Department may approve one set of source water monitoring sample results from the influent to satisfy the source water monitoring requirements for each treatment plant that uses that influent.

(iii) The supplier must collect source water monitoring samples before all chemical treatment.

(A) If the Department determines that collecting a sample before chemical treatment is not possible for the supplier and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample, the Department may approve the collection of source water monitoring samples after that chemical treatment.

(iv) For systems with treatment plants that use multiple surface water sources or blended surface water and groundwater sources, the supplier must:

(A) Collect source water monitoring samples during normal operating conditions.

(B) If a sampling location where the sources are combined before treatment is available, collect source water monitoring samples from that location.

(C) If a sampling location where the sources are combined before treatment is not available, collect source water monitoring samples from each source's intake on the same day. The supplier must comply with one of the following:

(I) Have a source water monitoring sample analyzed from each source and calculate a weighted average of the sample results based on plant flow at the time the sample is collected.

(II) Composite samples from each source into one sample before analysis.

(a) For composite samples, the volume of water from each source must be proportionate to the use of that source in the total plant flow at the time the sample is collected.

(v) For systems that recycle spent filter backwash water, the supplier must collect source water samples before the location of filter backwash water addition.

(vi) For systems that use bank filtration to comply with 11.8, the supplier must collect source water monitoring samples before the bank filtration.

(vii) For systems that use bank filtration as pretreatment to a filtration treatment plant, the supplier must collect source water monitoring samples after the bank filtration.

(A) The supplier must collect source water monitoring samples during periods of normal operating conditions.

(B) The supplier cannot receive treatment credit for the bank filtration as specified in 11.10(5)(f), to comply with the additional *Cryptosporidium* treatment technique requirements.

(d) Reporting Requirements for Source Water Monitoring Sample Results

(i) The supplier must submit source water monitoring sample results no later than the 10th of the second month following the month when the sample(s) was collected.

(ii) For each source water monitoring *Cryptosporidium* sample, the supplier must submit all of the following:

(A) State-assigned facility ID.

(B) Sample collection date.

(C) Sample type (i.e., field or matrix spike).

(D) Filtered sample volume in liters, to the nearest one-fourth liter.

(E) Percentage of filtered sample volume examined.

(F) Number of oocysts counted.

(G) For matrix spike samples, the sample volume spiked and estimated number of oocysts spiked.

(H) For samples where less than 10 liters are filtered or less than 100 percent of the sample volume is examined, the number of filters used and the packed pellet volume.

(I) For samples where less than 100 percent of sample volume is examined, the volume of resuspended concentrate and volume of this resuspension processed through immunomagnetic separation.

(iii) For each source water monitoring *E. coli* sample, the supplier must submit all of the following:

(A) State-assigned facility ID.

(B) Sample collection date.

(C) Analytical method number.

(D) Method type.

(E) Number of *E. coli* MPN/100 ml or CFU/100 ml.

(F) For systems supplying greater than or equal to (≥) 10,000 people, turbidity.

(e) Response to Repeated Failures to Monitor for *Cryptosporidium*

(i) If the supplier fails to monitor in any three months in either round of *Cryptosporidium* source water monitoring, the supplier must distribute Tier 2 public notice that:

(A) Meets the requirements specified in 11.33.

(B) Includes the following language and provides the specific information for the text in brackets:

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

(C) Includes a description of what the supplier is doing to correct the violation and when the supplier expects to return to compliance or resolve the situation.

(f) Grandfathering Previously Collected Source Water Monitoring Sample Results

(i) The supplier is not required to conduct some or all of the initial source water monitoring if the Department approves the grandfathering of source water monitoring samples that were collected before the applicable start date specified in Table 11.10-I.

(ii) For source water monitoring sample results to qualify for grandfathering, the analysis of source water *Cryptosporidium* samples and/or source water *E. coli* samples must meet the applicable analytical method and approved laboratory requirements specified in 11.46.

(iii) *Cryptosporidium* samples collected without corresponding *E. coli* and turbidity samples may qualify for grandfathering.

(A) If *Cryptosporidium* samples collected without corresponding *E. coli* and turbidity samples are grandfathered, the supplier is not required to collect *E. coli* and turbidity samples when completing the initial source water monitoring requirements for *Cryptosporidium*.

(iv) For source water monitoring sample results to qualify for grandfathering, the samples must have been collected as follows:

(A) The supplier must have collected *Cryptosporidium* samples no less frequently than monthly and with regular sample collection intervals.

(I) The supplier may grandfather source water monitoring samples that do not meet the monthly sampling frequency requirement, if the supplier conducts additional Department-specified monitoring to ensure that the source water monitoring sample results are seasonally representative and unbiased.

(II) If sample collection intervals vary for the reasons specified in 11.10(2)(b)(ii)(A-B), the supplier must submit documentation of the conditions that created the variations when reporting the source water monitoring sample results.

(B) The supplier must have collected *Cryptosporidium* samples no earlier than January 1999.

(C) The sampling location must meet the requirements specified in 11.10(2)(c).

(v) The supplier must submit intent to grandfather source water monitoring sample results no later than three months before the applicable start date specified in Table 11.10-I.

(A) The submission must include all of the following:

(I) The number of previously collected source water monitoring sample results the supplier will submit.

(II) The collection dates of the first and last source water monitoring sample results.

(III) If the supplier will conduct additional source water monitoring to meet the requirements specified in 11.10(2)(a)(ii).

(vi) For each previously collected source water monitoring sample intended for grandfathering, the supplier must submit, for approval, all of the following information no later than two months after the applicable start date specified in Table 11.10-I:

(A) The source water monitoring sample results. The supplier is not required to report matrix spike sample results.

(B) The applicable information as specified in 11.10(2)(d)(ii-iii).

(C) Certification that the submitted source water monitoring sample results include the results of all source water monitoring samples collected between the collection dates of the first reported result and the final reported result that meet the requirements specified in this section, 11.10(2)(f).

(D) Certification that the source water monitoring samples were representative of the treatment plant's source water and that the source water has not changed.

(E) A description of the sampling location which must address the site of the sampling location(s) in relation to the water source(s) and treatment processes, including pretreatment, points of chemical treatment, and filter backwash recycle.

(F) For *Cryptosporidium* samples, a letter from each laboratory that analyzed the samples certifying that the quality control criteria specified in the approved methods were met for each sample batch associated with the submitted source water monitoring sample results.

(I) Alternatively, the supplier may submit the bench sheets and sample examination report forms from the laboratory for each field, matrix spike, initial precision and recovery, ongoing precision and recovery, and method blank sample that are associated with the submitted source water monitoring sample results.

(vii) If the supplier submits source water monitoring sample results to be grandfathered that were not collected during times of normal source water conditions, such as during a drought, the Department may reject the source water monitoring sample results for grandfathering.

(A) The Department may subsequently approve rejected source water monitoring sample results if the supplier submits any Department-requested additional data about the source water to establish that the source water monitoring sample results are representative of average source water conditions.

(viii) If the supplier submits source water monitoring sample results to be grandfathered that are rejected by the Department and the supplier does not have a sufficient number of sample results to comply with the initial source water monitoring requirements, the supplier must replace the rejected samples by conducting additional source water monitoring as specified in this section, 11.10(2).

(A) The supplier is not required to begin the additional source water monitoring until two months after notification from the Department that samples were rejected and additional source water monitoring is required.

11.10(3) Requirements for Bin Classification

(a) Bin Classification Determination

(i) For systems supplying less than (<) 10,000 people where the supplier only monitored for *E. coli* and was not required to monitor for *Cryptosporidium*, the bin classification is Bin 1.

(ii) For systems where the supplier monitored for *Cryptosporidium*, the supplier must use the source water monitoring sample results from each round of source water monitoring to calculate the average *Cryptosporidium* concentration as specified in 11.10(3)(a)(iii) and use Table 11.10-II to determine the bin classification.

(iii) For systems where the supplier monitored for *Cryptosporidium*, after completing each round of source water monitoring, the supplier must calculate that round's average *Cryptosporidium* concentration using the *Cryptosporidium* source water monitoring sample results from that round as follows:

(A) If the supplier collected at least 48 samples, the average *Cryptosporidium* concentration is equal to the average of all sample result concentrations.

(B) If the supplier collected at least 24 samples but fewer than 48 samples, the average *Cryptosporidium* concentration is equal to the highest RAA of sample result concentrations in the 24 month monitoring period.

(C) If the system supplies less than (<) 10,000 people and the supplier monitored for *Cryptosporidium* for only 12 months, the average *Cryptosporidium* concentration is equal to the average of all sample result concentrations.

(D) If the system or treatment plant operates for only part of the year, the average *Cryptosporidium* concentration is equal to the highest average of all sample result concentrations collected during any year of *Cryptosporidium* monitoring.

(E) If the supplier collected more than one sample in any month, the supplier must calculate a monthly average of sample result concentrations for each month of monitoring and then use the monthly averages in the applicable calculation specified above in 11.10(3)(a)(iii)(A-D) instead of using individual sample result concentrations.

(iv) Using the average *Cryptosporidium* concentration calculated above, the supplier must use Table 11.10-II to determine the initial bin classification for the initial round of source water monitoring and the second bin classification for the second round of source water monitoring.

TABLE 11.10-II BIN CLASSIFICATION

For systems with an average *Cryptosporidium* concentration of:	The bin classification is:
<0.075 oocyst/L	Bin 1
≥0.075 oocyst/L and <1.0 oocyst/L	Bin 2
≥1.0 oocyst/L and <3.0 oocyst/L	Bin 3
≥3.0 oocyst/L	Bin 4

(b) Treatment Technique Requirement for Bin Classification

(i) The supplier must submit the bin classification for each round of source water monitoring for Department approval no later than six months after each round of source water monitoring is required to be completed.

(A) The bin classification submission must include a summary of the individual source water monitoring results and the calculation used to determine the bin classification.

(c) Treatment Technique Violation for Bin Classification

If the supplier fails to comply with the requirements specified in 11.10(3)(b)(i), a bin classification treatment technique violation occurs.

(d) Response to Treatment Technique Violation for Bin Classification

(i) In the event of a bin classification treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice that:

(I) Meets the requirements specified in 11.33.

(II) Includes the following language and provides the specific information for the text in brackets:

(a) 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) Includes a description of what the supplier is doing to correct the violation and when the supplier expects to return to compliance.

11.10(4) Requirements for Additional Cryptosporidium Treatment

(a) Treatment Technique Requirements for Additional *Cryptosporidium* Treatment

(i) Based on the initial bin classification determined under 11.10(3)(a) and the system's current treatment, the supplier must provide the applicable level of additional *Cryptosporidium* treatment as specified in Table 11.10-III.

(A) If the second bin classification is different than the initial bin classification, the supplier must provide the applicable level of additional *Cryptosporidium* treatment as specified in Table 11.10-III based on the second bin classification.

TABLE 11.10-III ADDITIONAL *CRYPTOSPORIDIUM* TREATMENT REQUIREMENTS

	Conventional filtration treatment (including softening)	Direct filtration	Slow sand or diatomaceous earth filtration	Alternative filtration technologies (i.e., membrane, bag, cartridge, etc)
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	As determined by the Department[1]
Bin 3	2-log treatment	2.5 log treatment	2-log treatment	As determined by the Department[2]
Bin 4	2.5-log treatment	3-log treatment	2.5-log treatment	As determined by the Department[3]

1 The total *Cryptosporidium* removal and inactivation must be at least 4.0-log.

2 The total *Cryptosporidium* removal and inactivation must be at least 5.0-log.

3 The total *Cryptosporidium* removal and inactivation must be at least 5.5-log.

(ii) The supplier must use one or more of the treatment and/or management options specified in the Microbial Toolbox in 11.10(5)(b) through 11.10(5)(o) to comply with the additional *Cryptosporidium* treatment requirements.

(A) For systems classified in Bin 3 or Bin 4, the supplier must achieve at least 1-log of the additional *Cryptosporidium* treatment by using one or more of the following treatment and/or management options:

(I) Bag filters.

(II) Bank filtration.

(III) Cartridge filters.

(IV) Chlorine dioxide.

(V) Membranes.

(VI) Ozone.

(VII) UV.

(iii) The supplier must begin complying with the additional *Cryptosporidium* treatment requirements for the initial bin classification no later than the applicable dates specified in Table 11.10-IV.

TABLE 11.10-IV ADDITIONAL *CRYPTOSPORIDIUM* TREATMENT COMPLIANCE DATES

For systems that were required to conduct source water monitoring as specified in Table 10-1 on:	The supplier must comply with additional *Cryptosporidium* treatment requirements no later than:[1]
Schedule 1	April 1, 2012
Schedule 2	October 1, 2012
Schedule 3	October 1, 2013
Schedule 4	October 1, 2014
Schedule 5	As approved by the Department

1 The Department may allow up to an additional two years for complying with the treatment requirement for suppliers making capital improvements.

(iv) The supplier must begin complying with the additional *Cryptosporidium* treatment requirements for the second bin classification on a Department-approved schedule.

(v) If the Department determines that after the supplier completed either round of source water monitoring significant changes occurred in the system's watershed that could lead to increased *Cryptosporidium* contamination of the source water, the supplier must take Department-specified actions to address the potential for contamination.

(A) These actions may include additional source water monitoring and/or implementing Microbial Toolbox options specified in 11.10(5)(b) through 11.10(5)(o).

(b) Treatment Technique Violation and Response for Additional *Cryptosporidium* Treatment

(i) If in any month the supplier fails to maintain the additional *Cryptosporidium* treatment specified in 11.10(4)(a) by not meeting the applicable criteria of the Microbial Toolbox options specified in 11.10(5)(b) through 11.10(5)(o), a *Cryptosporidium* treatment technique violation occurs.

(ii) In the event of a *Cryptosporidium* treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

11.10(5) Requirements for Microbial Toolbox Options

(a) Microbial Toolbox Options for Meeting Additional *Cryptosporidium* Treatment Requirements

(i) The supplier must use one or more of the Microbial Toolbox options specified in 11.10(5)(b) through 11.10(5)(o) to comply with the treatment technique requirements for additional *Cryptosporidium* treatment.

(ii) If the supplier meets the conditions for a Microbial Toolbox option specified in 11.10(5)(b) through 11.10(5)(o), the supplier receives the treatment credits specified in Table 11.10-V for that Microbial Toolbox option.

TABLE 11.10-V MICROBIAL TOOLBOX OPTIONS SUMMARY TABLE: TREATMENT CREDITS AND CRITERIA

Toolbox option	*Cryptosporidium* treatment credit	Design and implementation criteria	Criteria specified in:
Watershed control program	0.5-log credit	Department-approved program including required elements, annual program status report to Department, and regular watershed survey.	11.10(5)(b)
Alternative source/intake management	N/A	The supplier may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies.	11.10(5)(c)
Presedimentation basin with coagulation	0.5-log credit	During any month that presedimentation basins achieve a monthly average reduction of at least a 0.5-log of turbidity or alternative Department-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through basins.	11.10(5)(d)
Two-stage lime softening	0.5-log credit	Two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment.	11.10(5)(e)
Bank Filtration	0.5-log credit for 25-foot setback; 1.0-log credit for 50-foot setback	Aquifer must be unconsolidated sand containing at least 10 percent fines; average turbidity in wells must be less than (<) 1 NTU.	11.10(5)(f)
Combined filter performance	0.5-log credit	Combined filter effluent turbidity less than or equal (≤) to 0.15 NTU in at least 95 percent of monitoring results collected each month.	11.10(5)(g)
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 monitoring results collected each month for each filter and is never greater than (>) 0.3 NTU in two consecutive recordings for any filter.	11.10(5)(h)
Individual Bag or cartridge filters	Up to 2-log credit	Based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety.	11.10(5)(i)
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.	11.10(5)(i)

Toolbox option	*Cryptosporidium* treatment credit	Design and implementation criteria	Criteria specified in:
Membrane filtration	Based on testing results	Log credit equivalent to removal efficiency demonstrated during challenge testing for a device if supported by direct integrity testing.	11.10(5)(j)
Second stage filtration	0.5-log credit	Second granular media filtration stage if treatment train includes coagulation before the first filter.	11.10(5)(k)
Slow sand filters	2.5-log credit as a secondary filtration process; 3.0-log credit as a primary filtration process	Chlorination is not allowed before either option.	11.10(5)(l)
Chlorine dioxide	Based on measured CT in relation to CT table.		11.10(5)(m)
Ozone	Based on measured CT in relation to CT table		11.10(5)(m)
Ultraviolet Light (UV)	Based on validated UV dose in relation to UV dose table	Reactor validation testing required to establish UV dose and associated operating conditions.	11.10(5)(n)
Demonstration of performance	As approved by the Department	Credit awarded to unit process or treatment train based on a demonstration to the Department with a Department-approved protocol.	11.10(5)(o)

(b) Watershed Control Program

(i) The supplier receives 0.5-log *Cryptosporidium* treatment credit if the supplier implements a watershed control program that meets the requirements specified in this section, 11.10(5)(b).

(ii) If the supplier intends to apply for the watershed control program treatment credit, the supplier must notify the Department of this intent no later than two years before the applicable treatment compliance date specified in 11.10(4)(a).

(iii) The supplier must submit a proposed watershed control plan to the Department for approval no later than one year before the applicable treatment compliance date specified in 11.10(4)(a).

(A) The watershed control plan must include all of the following:

(I) Identification of an area of influence outside of which the likelihood of *Cryptosporidium* or fecal contamination affecting the treatment plant intake is not significant.

(II) Identification of both potential and actual sources of *Cryptosporidium* contamination and an assessment of the relative impact of these sources on the system's source water quality.

(III) An analysis of the effectiveness and feasibility of control measures that could reduce *Cryptosporidium* loading from sources of contamination to the system's source water.

(IV) A statement of goals and specific actions the supplier will take to reduce source water *Cryptosporidium* levels.

(V) An explanation of how the specific actions are expected to contribute to achieving specific goals.

(VI) Identification of watershed partners and their roles.

(VII) Identification of resource requirements and commitments.

(VIII) A schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(iv) For the supplier to receive watershed control program treatment credit, the Department must approve the watershed control plan.

(A) If the Department does not respond to the supplier regarding approval of a watershed control plan and the supplier meets the requirements specified in this section, 11.10(5)(b), the watershed control program will be considered approved and 0.5 log *Cryptosporidium* treatment credit will be awarded.

(I) If the Department subsequently finds the watershed control plan to be insufficient the Department may withdraw the approval.

(v) To maintain the 0.5-log *Cryptosporidium* treatment credit:

(A) The supplier must submit an annual watershed control program status report which must include all of the following:

(I) A description of the supplier's implementation of the approved watershed control plan and an assessment of the adequacy of the plan to meet its goals.

(II) An explanation of how the supplier is addressing any shortcomings in plan implementation, including those identified by the Department or as the result of a watershed sanitary survey.

(III) A description of any significant changes that have occurred in the watershed since the last watershed sanitary survey.

(IV) Any significant changes to the approved watershed control program that the supplier determines during implementation are necessary. The supplier must submit these changes before modifying the approved watershed control program.

(a) If the changes have the potential to reduce the level of source water protection, the supplier must also list in the submission the actions the supplier will take to mitigate this effect.

(B) A watershed sanitary survey must be conducted according to Department guidelines and by a Department-approved party.

(I) The supplier must have a watershed sanitary survey completed:

(a) For community water systems, every three years.

(b) For non-community water systems, every five years.

(II) The supplier must submit the watershed sanitary survey report to the Department.

(III) The watershed sanitary survey must meet all of the following criteria:

(a) Include the area of influence identified in the Department-approved watershed control plan.

(b) Evaluate the implementation of actions to reduce source water *Cryptosporidium* levels.

(c) Identify any significant new sources of *Cryptosporidium*.

(C) If the Department determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, another watershed sanitary survey must be conducted according to a Department-approved schedule.

(D) The supplier must make the watershed control plan, annual watershed control program status report, and watershed sanitary survey reports available to the public upon request.

(I) The documents must be written in plain language and include criteria to evaluate the success of the program in achieving the watershed control plan goals.

(II) If approved by the Department, the supplier may withhold portions of the watershed control plan, annual watershed control program status report, and watershed sanitary survey reports from the public based on source water security considerations.

(vi) If the Department determines that the supplier is not complying with the approved watershed control plan, the Department may withdraw the watershed control program treatment credit.

(c) Alternative Source

(i) If approved by the Department, the supplier may determine the bin classification, as specified in 11.10(3)(a), based on alternative source water monitoring results. If the supplier conducts alternative source water monitoring, the monitoring must meet one of the following criteria:

(A) Be at a different intake location for the current source(s).

(B) Be at an intake location for an alternative source(s).

(C) Use a different procedure for the timing or depth of withdrawal from the current source.

(ii) The supplier must concurrently conduct source water monitoring, as specified in 11.10(2), and the alternative source water monitoring.

(iii) The supplier must conduct the alternative source water monitoring such that it meets the requirements for source water monitoring to determine bin classification as specified in 11.10(2).

(iv) The supplier must report the alternative source water monitoring results, along with supporting information documenting the operating conditions under which the samples were collected.

(v) If the supplier chooses to determine the bin classification as specified in 11.10(3)(a) using the alternative source water monitoring results instead of using the source water monitoring results from the current source, the supplier must relocate the intake(s) or permanently adopt the withdrawal procedure used in the alternative source water monitoring, no later than the applicable treatment compliance date specified in 11.10(4)(a).

(d) Presedimentation

(i) The supplier receives 0.5-log *Cryptosporidium* treatment credit for a presedimentation basin in each month that all of the following criteria are met:

(A) The supplier continuously operates the presedimentation basin and treats the entire plant flow coming from the surface water source(s).

(B) The supplier continuously adds a coagulant to the presedimentation basin.

(C) The presedimentation process meets one of the following performance criteria:

(I) Complies with Department-approved performance criteria that demonstrate at least 0.5-log average removal of micron-sized particulate material through the presedimentation process.

(II) Demonstrates at least 0.5-log average reduction of influent turbidity.

(a) The supplier must sample the influent and effluent to the presedimentation process daily for turbidity to determine if the process meets the required average reduction of influent turbidity

(b) The average reduction of influent turbidity must be calculated as follows: $\log_{10}$ (monthly average of daily influent turbidity)-$\log_{10}$ (monthly average of daily effluent turbidity).

(e) Two-stage Lime Softening

(i) The supplier receives 0.5-log *Cryptosporidium* treatment credit for a two-stage lime softening plant if all of the following criteria are met:

(A) Chemical addition and hardness precipitation occur in two separate and sequential softening stages before filtration.

(B) Both softening stages treat the entire plant flow coming from the surface water source(s).

(f) Bank Filtration

(i) The supplier may receive either of the following *Cryptosporidium* treatment credit for bank filtration that is used as pretreatment to a filtration plant:

(A) For wells that have a groundwater flow path of at least 25 feet, the supplier receives 0.5-log *Cryptosporidium* treatment credit.

(B) For wells that have a groundwater flow path of at least 50 feet the supplier receives 1.0-log *Cryptosporidium* treatment credit.

(ii) The groundwater flow path is determined as follows:

(A) For vertical wells, the groundwater flow path is the measured distance from the well screen to the edge of the surface water body under high flow conditions as determined by the 100 year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps.

(B) For horizontal wells, the groundwater flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.

(iii) The supplier receives the *Cryptosporidium* treatment credit if all of the following criteria are met:

(A) The well is a horizontal or vertical well.

(B) The well is in a granular aquifer which is comprised of sand, clay, silt, rock fragments, pebbles or larger particles, or minor cement.

(I) The supplier must extract a core from the aquifer at the well site and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter make up at least 10 percent of the core material.

(C) The supplier monitors each wellhead for turbidity at least every four hours while the bank filtration process is in operation.

(I) If the monthly average turbidity level, based on highest daily turbidity measurements, is greater than (>) 1 NTU, the supplier must conduct an assessment to determine the cause of the exceedance.

(a) The supplier must submit the monthly average turbidity level and the assessment no later than 30 days after the month in which the exceedance occurred.

(II) If the Department determines that microbial removal capability has been compromised, the Department may withdraw the bank filtration treatment credit until the supplier implements Department-approved corrective actions.

(iv) The Department may approve *Cryptosporidium* treatment credit for bank filtration based on a demonstration of performance study. The treatment credit received may be greater than (>) 1.0-log and may be given to bank filtration that does not meet the criteria specified in 11.10(5)(f)(i-iii).

(A) The study must comply with Department-approved protocol and must involve the collection of data on the removal of *Cryptosporidium* or a surrogate for *Cryptosporidium* and related hydrogeologic and water quality parameters during the full range of operating conditions.

(B) The study must include sampling from both the production well(s) and from monitoring well(s) that are screened and located along the shortest flow path between the surface water source and the production well(s).

(v) For systems that were using bank filtration as pretreatment to a filtration treatment plant before beginning source water monitoring and where the supplier collected source water monitoring samples after bank filtration, the supplier cannot receive treatment credit for the bank filtration.

(vi) Springs and infiltration galleries are not eligible for treatment credit under this section, 11.10(5)(f), but are eligible for credit under a demonstration of performance as specified in 11.10(5)(o).

(g) Combined Filter Performance

(i) For systems using conventional filtration treatment or direct filtration treatment, the supplier receives 0.5-log *Cryptosporidium* treatment credit for combined filter effluent performance for each month the combined filter effluent turbidity monitoring results are less than or equal to (≤) 0.15 NTU in at least 95 percent of the turbidity monitoring results collected in that month.

(A) Compliance will be based on the combined filter effluent turbidity monitoring results collected under 11.8(2)(c).

(h) Individual Filter Performance

(i) For systems using conventional filtration treatment or direct filtration treatment, the supplier receives 0.5-log *Cryptosporidium* treatment credit for individual filter effluent performance for each month that all of the following criteria are met, based on the individual filter effluent turbidity monitoring results collected under 11.8(2)(g):

(A) The individual filter effluent turbidity monitoring results are less than or equal to (≤) 0.15 NTU in at least 95 percent of the turbidity monitoring results collected in that month; and

(B) No individual filter has turbidity monitoring results greater than (>) 0.3 NTU in two consecutive readings collected 15 minutes apart.

(ii) If the supplier fails to meet the requirements specified in 11.10(5)(h)(i) in any month, a *Cryptosporidium* treatment technique violation, as specified in 11.10(4)(b)(i), does not occur if the Department determines all of the following are met:

(A) That the failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing treatment plant design, operation, and maintenance.

(B) That the system has not experienced more than two such failures in any calendar year.

(i) Bag and Cartridge Filters

(i) The supplier receives up to 2.0-log *Cryptosporidium* treatment credit for an individual bag or cartridge filter and up to 2.5-log *Cryptosporidium* treatment credit for bag or cartridge filters operated in series that meet the criteria of this section, 11.10(5)(i).

(ii) The bag or cartridge filters must treat the entire plant flow coming from the surface water source(s).

(iii) The level of *Cryptosporidium* treatment credit received for bag or cartridge filters is based on the removal efficiency demonstrated during challenge testing conducted according to the following criteria:

(A) Challenge testing must be performed on full-scale bag or cartridge filters and the associated filter housing or pressure vessel that are identical in material and construction to the filters and housings the supplier will use for *Cryptosporidium* treatment.

(B) Bag or cartridge filters must be challenge tested in the configuration that the supplier will use either as individual filters or as a series of filters.

(C) Challenge testing must be conducted using one or more of the following challenge particulates: *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts.

(D) The concentration of the challenge particulate must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

(E) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

Maximum Feed Concentration = $1 \times 10^4 \times$ (Filtrate Detection Limit)

(F) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(G) Each filter evaluated must be tested until 100 percent of the terminal pressure drop is reached. This establishes the maximum pressure drop under which the filter may be used.

(H) Removal efficiency of the filter must be determined from the results of the challenge test and expressed in terms of log removal values (LRV) using the following equation:

$LRV = LOG_{10}(C_f) - LOG_{10}(C_p)$

Where:

LRV = log removal value demonstrated during challenge testing;

C_f = the feed concentration measured during the challenge test; and

C_p = the filtrate concentration measured during the challenge test.

(I) The same units must be used for the feed and filtrate concentrations.

(II) If the challenge particulate is not detected in the filtrate, then the term C_p must be set equal to the detection limit.

(I) Each filter tested must be challenged with the challenge particulate during the following three challenge periods over the filtration cycle:

(I) Within two hours of start-up of a new filter.

(II) When the pressure drop is between 45 and 55 percent of the terminal pressure drop.

(III) At the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop.

(J) The LRV must be calculated for each of the challenge periods for each filter tested. The LRV for the filter (LRV_{filter}) must be assigned the value of the lowest LRV observed during the three challenge periods for that filter.

(K) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line is equal to the lowest LRV_{filter} for the filters tested.

(L) If 20 or more filters are tested, the overall removal efficiency for the filter product line is equal to the 10^{th} percentile of the set of LRV_{filter} values for the filters tested.

(I) 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 10^{th} percentile may be calculated using linear interpolation.

(M) To determine removal credit, a factor of safety equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to the challenge testing results.

(N) The supplier must submit the challenge testing results.

(O) If a filter is challenge tested and the filter is later modified in a manner that could change the removal efficiency of the filter product line, the supplier must have a challenge test conducted to demonstrate the removal efficiency of the modified filter and the supplier must submit the test results to the Department.

(j) Membrane Filtration

(i) The supplier receives *Cryptosporidium* treatment credit for membrane filtration that meets the criteria of this section, 11.10(5)(j). The supplier receives *Cryptosporidium* treatment credit that is equal to whichever of the following is lower:

(A) The removal efficiency demonstrated during challenge testing conducted as specified in 11.10(5)(j)(ii).

(B) The highest removal efficiency that can be verified through direct integrity testing as specified in 11.10(5)(j)(iii).

(ii) To receive *Cryptosporidium* treatment credit the membrane used by the system must be challenge tested to demonstrate removal efficiency. The challenge test must be conducted according to the following criteria:

(A) Challenge testing must be performed on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system's treatment plant, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module.

(I) "MEMBRANE MODULE" means the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

(B) Challenge testing must be conducted using one of the following challenge particulates: *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts.

(C) The concentration of the challenge particulate must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity may not be used.

(D) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using the following equation:

Maximum Feed Concentration = 3.16×10^6 x (Filtrate Detection Limit)

(E) Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module.

(I) "FLUX" means the throughput of a pressure driven membrane process expressed as flow per unit of membrane area.

(II) "RECOVERY" means 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).

(F) Removal efficiency ($LRV_{C\text{-}Test}$) of each membrane module tested must be determined from the results of the challenge test and expressed in terms of log removal value using the following equation:

$LRV_{C\text{-}Test} = LOG_{10}(C_f) \times LOG_{10}(C_p)$

Where:

$LRV_{C\text{-}Test}$ = log removal value demonstrated during the challenge test;

C_f = the feed concentration measured during the challenge test; and

C_p = the filtrate concentration measured during the challenge test.

(I) The same units must be used for the feed and filtrate concentrations.

(II) If the challenge particulate is not detected in the filtrate, the term Cp is set equal to the detection limit.

(G) If fewer than 20 modules are tested, then $LRV_{C\text{-}Test}$ is equal to the lowest of the calculated LRVs for the modules tested.

(H) If 20 or more modules are tested, then $LRV_{C\text{-}Test}$ is equal to the 10^{th} percentile of the calculated LRVs for the modules tested.

(I) 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 10^{th} percentile may be calculated using linear interpolation.

(I) The challenge test must establish a quality control release value (QCRV) for a non-destructive performance test that demonstrates the *Cryptosporidium* removal capability of the membrane module. This performance test must be applied to each production membrane module used by the system that was not directly challenge tested in order to verify *Cryptosporidium* removal capability.

(I) Production membrane modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

(J) The supplier must submit the results of challenge testing.

(K) If a membrane is challenge tested and the filter is later 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, challenge testing must be conducted to demonstrate the removal efficiency and to determine a new QCRV for the modified membrane and the supplier must submit the results to the Department.

(iii) The supplier must conduct direct integrity tests according to the following criteria to demonstrate if the removal efficiency is greater than or equal to the removal credit received for the membrane filtration process:

(A) “DIRECT INTEGRITY TEST” means a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., leaks that could result in contamination of the filtrate).

(B) The direct integrity test must be independently applied to each membrane unit in service.

(I) “MEMBRANE UNIT” means a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

(C) The direct integrity test method must have a resolution of three micrometers or less.

(I) “RESOLUTION” means the size of the smallest integrity breach that contributes to a response from the direct integrity test.

(D) The direct integrity test must have a sensitivity sufficient to verify the log treatment credit received for the membrane filtration process.

(I) "SENSITIVITY" means the maximum log removal value that can be reliably verified by a direct integrity test.

(E) Sensitivity must be determined using one of the following approaches based on the type of direct integrity test the supplier uses.

(I) For direct integrity tests that use an applied pressure or vacuum, the direct integrity test sensitivity (LRV_{DIT}) must be calculated using the following equation:

$LRV_{DIT} = LOG_{10} (Q_p / (VCF \times Q_{breach}))$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test;

Q_p = total design filtrate flow from the membrane unit;

Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured, and

VCF = volumetric concentration factor. The volumetric concentration factor is the ratio of the suspended solids concentration on the high pressure side of the membrane relative to that in the feed water.

(II) For direct integrity tests that use a particulate or molecular marker, the direct integrity test sensitivity (LRV_{DIT}) must be calculated using the following equation:

$LRV_{DIT} = LOG_{10} (C_f)\text{-}LOG_{10} (C_p)$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test;

C_f = the typical feed concentration of the marker used in the test; and

C_p = the filtrate concentration of the marker from an integral membrane unit.

(F) The supplier must establish a control limit within the sensitivity limits of the direct integrity test that indicates that an integral membrane unit is capable of meeting the removal credit received.

(G) If the result of a direct integrity test exceeds the control limit established above in 11.10(5)(j)(iii)(F), the supplier must remove the membrane unit from service.

(I) The supplier must conduct a direct integrity test to verify any repairs, and may return the membrane unit to service only if the direct integrity test is within the established control limit.

(H) The supplier must conduct direct integrity testing on each membrane unit at least once on each day the membrane unit is in operation.

(I) The Department may approve less frequent testing based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.

(iv) The supplier must conduct continuous indirect integrity monitoring on each membrane unit according to the following criteria:

(A) "INDIRECT INTEGRITY MONITORING" means monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter.

(B) The supplier must conduct continuous indirect integrity monitoring of filtrate turbidity monitoring, unless the Department approves an alternative parameter.

(C) The supplier must collect continuous indirect integrity monitoring samples at least every 15 minutes.

(D) The supplier must conduct continuous indirect integrity monitoring separately for each membrane unit.

(E) If indirect integrity monitoring results for turbidity are greater than (>) 0.15 NTU in two consecutive readings collected 15 minutes apart, the supplier must conduct direct integrity testing immediately, as specified in 11.10(5)(j)(iii), on the membrane unit where the exceedance occurred.

(F) If indirect integrity monitoring for a Department-approved alternative parameter does not meet a Department-approved control limit for a period of 15 minutes or more, the supplier must conduct direct integrity testing immediately, as specified in 11.10(5)(j)(iii), on the membrane unit that did not meet the control limit.

(G) The supplier must submit a monthly report that summarizes all continuous indirect integrity monitoring results that triggered direct integrity testing and the corrective action that was taken in each case.

(H) If the supplier conducts direct integrity testing of membrane units continuously in accordance with the criteria specified in 11.10(5)(j)(iii), the supplier is not required to comply with the continuous indirect integrity monitoring requirements.

(k) Second Stage Filtration

(i) The supplier receives 0.5-log *Cryptosporidium* treatment credit for a second stage of filtration that consists of sand, dual media, granular activated carbon (GAC), or other fine grain media following granular media filtration.

(ii) To be eligible for this credit:

(A) The first stage of filtration must be preceded by a coagulation step.

(B) Both filtration stages must treat the entire plant flow coming from the surface water source(s).

(C) The Department must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

(iii) A cap, such as GAC, on a single stage of filtration is not eligible for this credit.

(l) Slow Sand Filtration as a Second Stage of Filtration

(i) The supplier receives 2.5-log *Cryptosporidium* treatment credit for a slow sand filtration process that follows a separate stage of filtration if:

(A) Both filtration stages treat entire plant flow coming from the surface water source(s);

(B) No disinfectant residual is present in the influent water to the slow sand filtration process; and

(C) The Department approves the treatment credit based on an assessment of the design characteristics of the filtration process.

(m) Ozone and Chlorine Dioxide

(i) The supplier receives the *Cryptosporidium* treatment credit for chlorine dioxide and/or ozone based on daily CT calculations where C and T are monitored during peak hourly flow.

(A) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in mg/L).

(B) For systems with multiple disinfection segments in sequence, the supplier may calculate CT for each segment and add the *Cryptosporidium* CT values for each sequential segment of treatment to determine the total CT for the treatment plant.

(ii) For systems using chlorine dioxide treatment, the supplier must calculate daily chlorine dioxide CT values as specified above in 11.10(5)(m)(i) and use Table 11.10-VI to determine the *Cryptosporidium* treatment log credit achieved by the chlorine dioxide treatment for the applicable water temperature.

TABLE 11.10-VI CT VALUES (MG-MIN/L) FOR *CRYPTOSPORIDIUM* INACTIVATION BY CHLORINE DIOXIDE[1]

Log credit	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C
	≤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 The supplier may use the following equation to determine log credit between the values in the table: Log credit = (0.001506 x (1.09116) Temp) x CT.

(iii) For systems using ozone treatment, the supplier must calculate daily ozone CT values as specified in 11.10(5)(m)(i) and use Table 11.10-VII to determine the *Cryptosporidium* treatment log credit achieved by the ozone treatment for the applicable water temperature.

TABLE 11.10-VII CT VALUES (MG-MIN/L) FOR *CRYPTOSPORIDIUM* INACTIVATION BY OZONE[1]

Log credit	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C	Water temperature, °C
	≤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 The supplier may use the following equation to determine log credit between the values in the table: Log credit = (0.0397 x (1.09757)Temp) x CT.

(n) Ultraviolet Light

(i) The supplier receives the *Cryptosporidium* treatment credit in Table 11.10-VIII for ultraviolet light (UV) reactors by achieving the corresponding UV dose values in Table 11.10-VIII if:

(A) The supplier applies the UV treatment after filtration.

(B) The supplier uses a low pressure mercury vapor lamp that produces UV light at a wavelength of 254 nm.

(I) To receive treatment credit for other lamp types, the supplier must demonstrate an equivalent germicidal dose through reactor validation testing, as specified in 11.10(5)(n)(i)(C).

(C) The supplier uses UV reactors that have undergone validation testing to determine the validated operating conditions under which the reactor delivers the UV dose required Table 11.10-VIII.

(I) Validation testing must include the following:

(a) Full scale testing of a reactor that represents the UV reactors used by the system; and

(b) Inactivation of a test microorganism whose dose response characteristics have been quantified with a low pressure mercury vapor lamp.

(II) The validated operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

(III) When determining validated operating conditions, the supplier must account for the following factors:

(a) UV absorbance of the water;

(b) Lamp fouling and aging;

(c) Measurement uncertainty of on-line sensors;

(d) UV dose distributions arising from the velocity profiles through the reactor;

(e) Failure of UV lamps or other critical system components; and

(f) Inlet and outlet piping or channel configurations of the UV reactor.

(D) At least 95 percent of the water supplied to the public during each month is treated by a UV reactor within validated operating conditions for the required UV dose.

(E) The supplier monitors the UV reactor(s) to determine if the treatment meets the criteria in 11.10(5)(n)(i)(C). UV reactor monitoring must include:

(I) UV intensity as measured by a UV sensor;

(a) The supplier must verify the calibration of UV sensors and must recalibrate sensors in accordance with a Department-approved protocol.

(II) Flow rate;

(III) Lamp status; and

(IV) Other parameters the Department designates based on UV reactor operation.

TABLE 11.10-VIII UV DOSE TABLE FOR *CRYPTOSPORIDIUM* INACTIVATION CREDIT

Log credit	*Cryptosporidium* UV dose (mJ/cm^2)
0.5	1.6
1.0	2.5
1.5	3.9
2.0	5.8
2.5	8.5
3.0	12
3.5	15
4.0	22

(o) Demonstration of Performance

(i) If approved by the Department, the supplier may receive *Cryptosporidium* treatment credit for treatment processes based on a demonstration of performance study that meets the criteria of this section, 11.10(5)(o). The treatment credit awarded may be greater than or less than the treatment credits specified in the Microbial Toolbox in 11.10(5)(b) through 11.10(5)(m) and may be awarded to treatment processes that do not meet the criteria specified in the Microbial Toolbox.

(A) If the supplier receives treatment credit for a treatment process included in the Microbial Toolbox through this demonstration of performance, the supplier cannot also receive the treatment credit for the Microbial Toolbox option specified in Table 11.10-V and 11.10(5)(b) through 11.10(5)(m).

(B) The supplier must complete the demonstration of performance study according to a Department-approved protocol and must demonstrate the level of *Cryptosporidium* reduction the treatment process will achieve under the full range of expected system operating conditions.

(C) The supplier must receive Department-approval in writing and the approval may require the supplier to conduct monitoring and demonstrate compliance with treatment performance criteria and submit the results to remain eligible for the treatment credit.

(I) The Department may specify treatment performance criteria to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

(p) Microbial Toolbox Reporting Requirements

(i) The supplier must submit the information in Table 11.10-IX for any Microbial Toolbox options used to comply with the additional *Cryptosporidium* treatment requirements.

(A) The Department may approve the supplier to certify operation within required parameters for the additional *Cryptosporidium* treatment credit rather than reporting monthly operational data for Microbial Toolbox options.

TABLE 11.10-IX MICROBIAL TOOLBOX REPORTING REQUIREMENTS

Toolbox option	The supplier must submit the following information:	No later than:
Watershed control program	Notice of intention to develop a watershed control program.	Two years before the applicable treatment compliance date specified in 11.10(4)(a).
	Watershed control plan.	One year before the applicable treatment compliance date in specified 11.10(4)(a).
	Annual watershed control program status report.	Every 12 months.
	Watershed sanitary survey report.	For community water systems, every three years. For non-community water systems, every five years.
Alternative source/intake management	Verification that the supplier has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results.	The applicable treatment compliance date specified in 11.10(4)(a).
Presedimentation	Monthly verification of: - Continuous basin operation; - Treatment of 100 percent of the plant flow; - Continuous addition of a coagulant; - At least 0.5-log average reduction of influent turbidity or compliance with alternative Department-approved performance criteria.	The 10th of the month following the month in which the monitoring was conducted.

TABLE 11.10-IX MICROBIAL TOOLBOX REPORTING REQUIREMENTS		
Toolbox option	The supplier must submit the following information:	No later than:
Two-stage lime Softening	Monthly verification that: - Chemical addition and hardness precipitation occurred in two separate and sequential softening stages before filtration; - Both stages treated 100 percent of the plant flow.	The 10th of the month following the month in which the monitoring was conducted.
Bank Filtration	Initial demonstration of: - Unconsolidated, predominantly sandy aquifer; - Setback distance of at least 25 ft. (0.5-log credit) or 50 ft. (1.0-log credit.	The applicable treatment compliance date specified in 11.10(4)(a).
	If the monthly average turbidity level is greater than (>) 1 NTU, the supplier must report the results and submit an assessment of the cause.	30 days after the month in which the monitoring was conducted.
Combined filter performance	Monthly verification that combined filter effluent turbidity levels are less than or equal (≤) to 0.15 NTU in at least 95 percent of turbidity monitoring results collected each month.	The 10th of the month following the month in which the monitoring was conducted.
Individual filter performance	Monthly verification that: - Individual filter effluent (IFE) turbidity levels less than or equal to (≤) 0.15 NTU in at least 95 percent of turbidity monitoring results collected each month at each filter; - No individual filter greater than (>) 0.3 NTU in two consecutive readings.	The 10th of the month following the month in which the monitoring was conducted.
Bag or cartridge filters	Demonstration that the following criteria are met: - Process meets the definition of bag or cartridge filtration; - Removal efficiency established through challenge testing.	The applicable treatment compliance date specified in 11.10(4)(a).
	Monthly verification that 100% of plant flow was filtered.	The 10th of the month following the month in which the monitoring was conducted.
Membrane filtration	Results of verification testing demonstrating: - Removal efficiency established through challenge testing; - Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline.	The applicable treatment compliance date specified in 11.10(4)(a).
	Monthly report summarizing: - All direct integrity tests above the control limit; - If applicable, any turbidity or alternative Department-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken.	The 10th of the month following the month in which the monitoring was conducted.
Second stage filtration	Monthly verification that 100 percent of plant flow was filtered through both stages and that first stage was preceded by a coagulation step.	The 10th of the month following the month in which the monitoring was conducted.
Slow sand filters	Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100 percent of plant flow from surface water sources.	The 10th of the month following the month in which the monitoring was conducted.

TABLE 11.10-IX MICROBIAL TOOLBOX REPORTING REQUIREMENTS		
Toolbox option	The supplier must submit the following information:	No later than:
Chlorine dioxide	Summary of CT values for each day as specified in 11.10(5)(m).	The 10th of the month following the month in which the monitoring was conducted.
Ozone	Summary of CT values for each day as specified in 11.10(5)(m).	The 10th of the month following the month in which the monitoring was conducted.
UV	Validation test results demonstrating operating conditions that achieve required UV dose.	The applicable treatment compliance date specified in 11.10(4)(a).
	Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated operating conditions for the required dose as specified in 11.10(5)(n).	The 10th of the month following the month in which the monitoring was conducted.
Demonstration of performance	Results from testing following a Department approved protocol.	The applicable treatment compliance date specified in 11.10(4)(a).
	As required by the Department, monthly verification of operation within conditions of Department approval for demonstration of performance credit.	The 10th of the month following the month in which the monitoring was conducted.

11.11 GROUNDWATER RULE

11.11(1) General Applicability and Definitions

(a) For all groundwater systems, the supplier must comply with the requirements specified in this rule.

(i) For the purposes of this rule, a “GROUNDWATER SYSTEM” means any public water system that meets one or more of the following criteria:

(A) The system only uses groundwater sources.

(B) The system uses both surface water and groundwater sources and does not combine the groundwater sources and surface water sources before treatment.

(I) This rule only applies to the groundwater sources.

(II) Systems that combine groundwater sources with surface water sources before treatment are not considered groundwater systems.

(C) The system is a consecutive system that receives finished water from a groundwater system.

11.11(2) Minimum Disinfection Treatment Requirements

(a) Applicability for Minimum Disinfection Treatment Requirements

(i) The supplier must comply with the requirements specified in this section, 11.11(2), unless one or more of the following conditions apply:

(A) The groundwater system is operating under a disinfection waiver and the supplier is required to comply with 11.13.

(B) The groundwater system has only hand-pumped wells and the supplier is required to comply with 11.12.

(C) The groundwater system has hand-pumped wells and other sources and the supplier is required to comply with this section, 11.11(2), for the groundwater sources that are not hand-pumped wells and with 11.12 for the groundwater sources that are hand-pumped wells.

(D) The groundwater system is a consecutive system that only supplies finished groundwater received from a wholesale system and therefore supplier is required to comply with 11.11(2)(b)(i)(B)(II-III), 11.11(2)(c)(i)(B), 11.11(2)(c)(i)(C), 11.11(2)(d)(i)(B-C), and 11.11(2)(e)(ii).

(b) Treatment Technique Requirements for Minimum Disinfection Treatment

(i) The minimum disinfection treatment technique requirements are as follows:

(A) When a groundwater source is used to supply water to the public, the supplier must disinfect the water using a chemical treatment method.

(B) When a groundwater source is used to supply water to the public, the supplier must maintain a residual disinfectant concentration at each entry point and throughout the distribution system.

(I) At each entry point, the residual disinfectant concentration must be greater than or equal to (≥) 0.2 mg/L.

(II) In the distribution system, the residual disinfectant concentration must be greater than or equal to (≥) 0.2 mg/L.

(ii) No later than December 31, 2015, the supplier may apply to the Department for an extension for complying with the treatment technique requirements specified in 11.11(2)(b)(i)(B)(III).

(A) In the application, the supplier must include all of the following information:

(I) An explanation of why the supplier is unable to comply with the treatment technique requirements specified in 11.11(2)(b)(i)(B)(III).

(II) A distribution system disinfectant residual data analysis demonstrating the inability to comply with the treatment technique requirements specified in 11.11(2)(b)(i)(B)(III).

(III) An engineering report prepared by a professional engineer registered in the state of Colorado demonstrating that capital improvements are necessary to comply with the treatment technique requirements specified in 11.11(2)(b)(i)(B)(III).

(IV) A proposed schedule for completing the system modifications.

(B) The Department shall consider the following criteria when determining if an extension will be granted:

(I) The supplier submitted a complete application that included the information specified above;

(II) The supplier has complied with the monitoring requirements specified in 11.17 in the last 36 months; and

(III) The supplier has not incurred an MCL violation specified in 11.17(9) in the last 36 months.

(iii) The Department will only grant an extension for up to four years.

(iv) If the supplier receives written Department-approval for an extension, the supplier must:

(A) Continue to comply with the treatment technique requirements specified in 11.11(2)(b)(i)(B)(II) and is subject to the violation specified in 11.11(2)(d)(i)(B) until the capital improvements are completed or the extension expires, whichever comes first; and

(B) Comply with any Department-specified requirements.

(c) Monitoring Requirements for Minimum Disinfection Treatment Technique Requirements

(i) To determine compliance with the minimum disinfection treatment technique requirements, the supplier must monitor the residual disinfectant concentration.

(A) At each entry point, the supplier must monitor the residual disinfectant concentration at least once each week that water is supplied to the public from that entry point.

(I) If any entry point residual disinfectant concentration result is less than (<) 0.2 mg/L, the supplier must increase the residual disinfectant concentration monitoring frequency at that entry point to at least once every 24 hours from the time of discovery until the residual disinfectant concentration is greater than or equal to (≥) 0.2 mg/L.

(B) In the distribution system, the supplier must, at a minimum, monitor the residual disinfectant concentration at the same time and at the same sampling locations as the total coliform samples collected under 11.16(4) and 11.16(5).

(C) The supplier must measure the residual disinfectant concentration as free chlorine unless the supplier uses a disinfection process that results in a monochloramine residual disinfectant, then the supplier must measure the residual disinfectant concentration as total chlorine. If the supplier uses a different type of chemical disinfectant (e.g., ozone or chlorine dioxide), the supplier must measure the appropriate residual disinfectant concentration.

(d) Treatment Technique Violations for the Minimum Disinfection Treatment Requirements

(i) The following constitute disinfection treatment technique violations:

(A) At any entry point, the residual disinfectant concentration is less than (<) 0.2 mg/L for more than 72 hours after the time of discovery.

(B) In the distribution system:

(I) If the supplier collects greater than or equal to (≥) 40 residual disinfectant concentration samples per month, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than 5 percent of the samples collected.

(II) If the supplier collects greater than (>) one but less than (<) 40 residual disinfectant concentration samples per month, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than one sample collected.

(III) If the supplier collects greater than (>) one but less than (<) 40 residual disinfectant concentration samples per month, the residual disinfectant concentration is less than (<) 0.2 mg/L in more than 5 percent of the samples collected in each month for two consecutive months that the system supplies water to the public.

(IV) If the supplier collects only one residual disinfectant concentration sample per monitoring period, the residual disinfectant concentration is less than (<) 0.2 mg/L.

(e) Response to Treatment Technique Violations for the Minimum Disinfection Treatment Requirements

(i) In the event of an entry point treatment technique violation as specified in 11.11(2)(d)(i)(A), the supplier must:

(A) Notify the Department as soon as possible but no later than the end of the next business day.

(B) Determine and resolve the failure that resulted in the treatment technique violation.

(C) No later than 48 hours after the resolution of the failure, document all of the following:

(I) The date, time and duration of the failure.

(II) The cause of the failure.

(III) The steps taken to correct the failure.

(IV) What steps will be taken to prevent future failures.

(D) Submit the documentation specified above in 11.11(2)(e)(i)(C) if required by the Department.

(E) Distribute Tier 2 public notice as specified in 11.33.

(ii) In the event of a distribution system treatment technique violation as specified in 11.11(2)(d)(i)(B-C), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 33.

11.11(3) Requirements for 4-Log Treatment of Viruses

(a) Applicability for 4-Log Treatment of Viruses

(i) For any new or existing groundwater source that is treated to at least 4-log treatment of viruses at the entry point, either by choice or because the supplier is required to as specified in 11.38(3)(a)(i)(D) or 11.11(6), the supplier must comply with the requirements specified in this section, 11.11(3).

(A) If the supplier is subject to the requirements specified in this section, 11.11(3), the supplier is not required to meet the source water monitoring requirements specified in 11.11(4) and 11.11(5).

(b) Notification of 4-Log Treatment of Viruses

(i) The supplier must submit notification that the system is providing at least 4-log treatment of viruses at the entry point(s).

(A) The submission must include engineering, operational, or other information that the Department requests to evaluate the submission.

(c) Treatment Technique Requirements for 4-Log Treatment of Viruses

(i) The supplier may use one of the following to comply with the 4-log treatment of viruses treatment technique requirements, as approved by the Department:

(A) Chemical disinfection.

(B) Alternative treatment methods.

(ii) If the supplier uses chemical disinfection to comply with the 4-log treatment of viruses treatment technique requirements, the supplier must maintain the Department-approved residual disinfectant concentration at the Department-approved location(s) that represent treated water at the entry point.

(iii) If the supplier uses a Department-approved alternative treatment method to comply with the 4-log treatment of viruses treatment technique requirements, the supplier must operate the alternative treatment according to Department-specified requirements.

(d) Monitoring Requirements for 4-Log Treatment of Viruses

(i) To determine compliance with the 4-log treatment of viruses treatment technique requirements, the supplier must:

(A) Begin monitoring no later than 30 days after placing the source in service.

(B) Monitor at the Department-approved location and/or according to the Department-specified requirements.

(ii) If the supplier uses chemical disinfection to comply with the 4-log treatment of viruses treatment technique requirements, the supplier must also:

(A) For a system that supplies greater than (>) 3,300 people, continuously monitor the residual disinfectant concentration at the Department-approved location(s).

(I) If there is a failure in the continuous monitoring equipment, the supplier must monitor the residual disinfectant concentration by collecting grab samples every four hours until the continuous monitoring equipment is returned to service.

(a) The supplier must resume continuous residual disinfectant concentration monitoring no later than 14 days after the equipment failure.

(B) For a system that supplies less than or equal to (≤) 3,300 people, monitor the residual disinfectant concentration daily by collecting grab samples at the Department-approved location(s).

(I) The supplier must collect a daily grab sample during the hour of peak flow or at another time specified by the Department.

(II) If any daily grab sample result is less than (<) the Department-approved residual disinfectant concentration, the supplier must monitor the residual disinfectant concentration every four hours until it is greater than or equal to (≥) the Department-approved residual disinfectant concentration.

(III) Alternatively, the supplier may monitor continuously as specified in 11.11(3)(d)(ii)(A).

(C) When a groundwater source is used to supply water to the public, record the lowest residual disinfectant concentration monitored each day.

(iii) If the supplier uses a Department-approved alternative treatment method to comply with the 4-log treatment of viruses treatment technique requirements, the supplier must monitor according to Department-specified requirements.

(e) Treatment Technique Violation and Response for 4-Log Treatment of Viruses

(i) If the supplier fails to provide at least 4-log treatment of viruses at the Department-approved location and/or according to the Department-specified requirements and the failure is not corrected within four hours from the time of discovery, a 4-log treatment of viruses treatment technique violation occurs.

(ii) In the event of a 4-log treatment of viruses treatment technique violation, the supplier must:

(A) Notify the Department as soon as possible but no later than the end of the next business day.

(B) Distribute Tier 2 public notice as specified in 11.33.

(f) Discontinuing Monitoring for Compliance With 4-log Treatment of Viruses Requirements

(i) The supplier may submit a request to discontinue the monitoring requirements for 4-log treatment of viruses. If the Department determines that monitoring for a source is no longer necessary, the Department shall document the decision in writing and the supplier may discontinue monitoring that source as specified in 11.11(3)(d).

(A) If the supplier has received Department-approval to discontinue monitoring as specified in 11.11(3)(d), the supplier must continue monitoring the source water as specified in 11.11(4) and 11.11(5) and meet the minimum residual disinfectant concentration requirements specified in 11.11(2).

11.11(4) Triggered Source Water Monitoring

(a) Applicability for Triggered Source Water Monitoring

(i) The supplier must conduct triggered source water monitoring if:

(A) The supplier does not provide at least 4-log treatment of viruses (using inactivation, removal, or a Department-approved combination of 4-log inactivation and removal) at the entry point to the distribution system for each groundwater source as specified in 11.11(3); and

(B) The supplier is notified that a sample collected under 11.16 is total coliform-positive and the sample was not invalidated under 11.16(7).

(ii) The supplier is not required to conduct triggered source water monitoring if either of the following conditions are met:

(A) The Department determines and documents in writing that the routine total coliform-positive sample collected under 11.16, was caused by a distribution system deficiency and not by the source water.

(B) The supplier collected the routine total coliform-positive sample collected under 11.16 at a location that meets Department criteria for distribution system conditions that will cause total coliform-positive sample results and therefore the total coliform-positive sample result was not caused by the source water.

(I) No later than 30 days after receiving the total coliform-positive sample result, the supplier must submit documentation that demonstrates the sample location met Department criteria.

(b) Monitoring Requirements for Triggered Source Water Monitoring

(i) The supplier must collect triggered source water monitoring samples no later than 24 hours after being notified of a total coliform-positive sample collected under 11.16.

(A) If the supplier experiences circumstances beyond their control that prevent the supplier from collecting the source water samples, the Department may extend the 24-hour limit on a case-by-case basis.

(I) If the Department approves the extension, the Department shall specify how much time the supplier has to collect the source water samples.

(ii) The supplier must collect at least one triggered source water monitoring sample from each groundwater source that was in use at the time the total coliform-positive sample was collected. These samples must be collected at the well, before any treatment is applied.

(A) If the system's configuration does not allow for the supplier to sample at the well itself, the Department may:

(I) Approve the collection of triggered source water monitoring samples at a location that represents the water quality of that well or a location after treatment; and/or

(II) Require that sampling equipment be installed at the well itself.

(B) For systems with more than one groundwater source, the Department may approve collection of the triggered source water monitoring samples from a representative groundwater source(s).

(I) The representative source(s) must supply water to the section of the distribution system where the total coliform-positive sample was collected.

(II) If required by the Department, the supplier must submit, for approval, a triggered source water monitoring plan to use a representative source(s).

(a) The triggered source water monitoring plan must identify which source(s) the supplier intends to use for representative sampling of groundwater sources. For each representative source identified, the supplier must identify each total coliform sampling location that the source represents in the system's sampling plan specified in 11.16(3).

(C) For a groundwater system supplying less than or equal to (≤) 1,000 people that uses *E. coli* as a fecal indicator for triggered source water monitoring, the supplier may use a triggered source water monitoring sample to meet both the repeat sampling requirements specified in 11.16(5), and the triggered source water monitoring requirements. If the repeat sample collected from the groundwater source is *E. coli*-positive, the supplier must comply with the requirements in 11.11(4)(d).

(iii) The supplier must have all groundwater source samples analyzed for the presence of one of the following fecal indicators: *E. coli*, enterococci, or coliphage.

(c) Additional Triggered Source Water Monitoring Requirements for Consecutive and Wholesale Systems

(i) For consecutive systems, no later than 24 hours after being notified of the sample result, the supplier responsible for the consecutive system must notify all of their wholesalers of a total coliform-positive sample result collected under 11.16.

(ii) A wholesale system that receives notification from a consecutive system it serves that a sample collected under 11.16 is total coliform-positive, the wholesaler must sample all of its groundwater source(s) as specified above in 11.11(4) no later than 24 hours and analyze the samples for a fecal indicator under 11.46(2)(b and e).

(d) Response to Triggered Source Water Monitoring Fecal Indicator-Positive Sample Results

(i) If the supplier has a fecal indicator-positive triggered source water monitoring sample result, that is not invalidated under 11.11(4)(e)(i), the supplier must:

(A) Notify the Department and initiate consultation no later than 24 hours after being notified of the fecal indicator-positive initial triggered source water monitoring sample result.

(B) Distribute Tier 1 public notice as specified in 11.33.

(I) For all consecutive systems supplied by the groundwater source that tested positive for a fecal indicator, the supplier responsible for the consecutive system must also distribute Tier 1 public notice to its consumers as specified in 11.33.

(C) No later than 24 hours after being notified of the fecal indicator-positive triggered source water monitoring sample result, the supplier must collect five confirmation samples from the same source unless the Department requires the supplier to implement corrective action as specified in 11.11.

(I) If the supplier collects more than one triggered source water monitoring sample at the location required to meet the total coliform repeat sampling requirements specified in 11.16, the supplier may use any of those triggered source water monitoring samples that were *E.* coli-negative toward complying with the five required confirmation samples.

(II) If one or more of the confirmation samples is fecal indicator-positive, the supplier must implement corrective action as specified in 11.11(6).

(D) For a wholesale system, notify all consecutive systems that are supplied by that source of the original fecal indicator-positive sample result no later than 24 hours after being notified of the sample result and meet the requirements of 11.11(4)(d).

(e) Sample Invalidation for Triggered Source Water Monitoring

(i) At the supplier's request, the Department may invalidate a fecal indicator-positive triggered source water monitoring sample based on one of the following conditions:

(A) The supplier submits written notice from the laboratory that improper sample analysis occurred.

(B) The Department determines and documents in writing that there is substantial evidence that the fecal indicator-positive triggered source water monitoring sample result is not related to source water quality.

(ii) If the Department invalidates a fecal indicator-positive triggered source water monitoring sample result, the supplier must collect a replacement source water sample no later than 24 hours after being notified by the Department of the invalidation.

(A) The replacement sample must meet all triggered source water monitoring requirements specified in 11.11(4). Additionally, the replacement sample must be analyzed by the laboratory for the same fecal indicator as the invalidated source sample.

(B) If the supplier experiences circumstances beyond their control that prevent the supplier from collecting the source water sample(s), the Department may extend the 24-hour limit on a case-by-case basis.

(I) If the Department approves the extension, the Department shall specify how much time the supplier has to collect the replacement source water samples.

11.11(5) Assessment Source Water Monitoring

(a) Applicability for Assessment Source Water Monitoring

(i) If required by the Department, the supplier must comply with the assessment source water monitoring requirements specified in this section, 11.11(5).

(A) To determine if assessment source water monitoring shall be required, the Department may request that the supplier provide information that will enable the Department to complete a hydrogeologic sensitivity assessment.

(I) "HYDROGEOLOGIC SENSITIVITY ASSESSMENT" means a determination of whether a groundwater system obtains water from hydrogeologically sensitive settings. The following describe sensitive settings that can increase the risk of fecal contamination:

(a) Aquifers that exist in an area with high population densities combined with onsite wastewater treatment systems.

(b) Aquifers in which viruses may travel faster and further than bacteria (e.g. alluvial or sand aquifers).

(c) Shallow, unconfined aquifers.

(d) Aquifers with thin or absent soil cover.

(e) Areas where wells have previously been identified as having fecal contamination.

(f) Sensitive aquifers.

(ii) For new sources, the Department may require the supplier to begin assessment source water monitoring before the new source supplies water to the public.

(b) Monitoring Requirements for Assessment Source Water Monitoring

(i) Department-determined assessment source water monitoring requirements may include, but are not limited to:

(A) Collection of a groundwater source sample(s) each month the system supplies water to the public for a total of at least 12 samples for each groundwater source.

(B) Collection of groundwater source samples from each well unless the supplier obtains written Department approval to conduct representative sampling.

(I) "REPRESENTATIVE SAMPLING" means samples are collected at one or more wells within the groundwater system that are representative of multiple wells used by that system because the wells draw water from the same hydrogeologic setting.

(C) Collection of groundwater source samples at a location before any treatment of the groundwater source, unless the Department approves a sampling location after treatment.

(D) Collection of groundwater source samples at the well itself unless the system's configuration does not allow for sampling at the well itself and the Department approves an alternative sampling location that is representative of the water quality of that well.

(E) Analysis of assessment source water monitoring samples for the presence of *E. coli,* enterococci, or coliphage.

(F) Collection of a standard sample volume of at least 100 ml for fecal indicator analysis for assessment source water monitoring samples.

(ii) If the supplier is required to conduct assessment source water monitoring, the supplier may use triggered source water monitoring samples collected under 11.11(4) to meet the requirements of assessment source water monitoring.

(c) Response to Assessment Source Water Monitoring Fecal Indicator-Positive Sample Results

(i) If an assessment source water monitoring sample result is fecal indicator-positive, the supplier must:

(A) Distribute Tier 1 public notice as specified in 11.33.

(I) For all consecutive systems supplied by the groundwater source that tested positive for a fecal indicator, the supplier responsible for the consecutive system must also comply with this public notification requirement.

(B) If required by the Department, implement corrective action as specified in 11.11(6).

11.11(6) Corrective Action for Source Water Fecal Indicator-Positive Monitoring Results

(a) Applicability

(i) The supplier must comply with the requirements specified in this section, 11.11(6), if:

(A) A confirmation triggered source water monitoring sample result collected under 11.11(4)(d)(i)(C) is fecal indicator-positive; or

(B) The supplier is required to by the Department after either:

(I) A fecal indicator-positive initial triggered source water monitoring sample collected under 11.11(4)(b)(i-ii) or 11.11(4)(c)(ii); or

(II) A fecal indicator-positive assessment source water monitoring sample collected under 11.11(5)(b).

(b) Corrective Action Requirements

(i) The supplier must implement one or more of the following corrective actions:

(A) Correct all significant deficiencies.

(B) Provide an alternative source of water.

(C) Eliminate the source of contamination.

(D) Provide treatment that reliably achieves at least 4-log treatment of viruses at the Department-approved location for the groundwater source.

(ii) The Department may specify interim measures at any time pending completion of corrective action to protect public health.

(iii) No later than 30 days after receiving written notice from a laboratory of a fecal indicator-positive confirmation triggered source water monitoring sample result collected under 11.11(4)(d)(i)(C) or receiving direction from the Department to complete corrective action as specified in 11.11(6)(a)(i)(B), the supplier must consult with the Department regarding the appropriate corrective action, unless the Department specifies which corrective action the supplier must implement.

(iv) No later than 45 days after receiving written notice from a laboratory of a fecal indicator-positive confirmation triggered source water monitoring sample result collected under 11.11(4)(d)(i)(C) or receiving direction from the Department to complete corrective action as specified in 11.11(6)(a)(i)(B), the supplier must submit a corrective action plan for approval.

(A) The corrective action plan must include the actions the supplier will take to address the fecal indicator-positive groundwater source sample(s) and a proposed schedule for completing the actions.

(v) Any changes the supplier makes to a Department-approved corrective action plan and schedule must be approved by the Department.

(vi) No later than 120 days, or earlier if required by the Department, after receiving written notice from a laboratory of a fecal indicator-positive confirmation triggered source water monitoring sample result collected under 11.11(4)(d)(i)(C) or receiving direction from the Department to complete corrective action as specified in 11.11(6)(a)(i)(B), the supplier must either:

(A) Have completed the Department-approved corrective action plan including any Department-specified interim measures; or

(B) Be in compliance with a Department-approved corrective action plan and schedule including any Department-specified interim measures.

(vii) No later than 30 days after completing any corrective action under 11.11(6)(b), the supplier must notify the Department of the completed corrective action.

(c) Treatment Technique Violation and Response for Corrective Action

(i) If the supplier fails to comply with the requirements specified in 11.11(6)(b), a corrective action treatment technique violation occurs.

(ii) In the event of a corrective action treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

11.12 GROUNDWATER RULE: HAND-PUMPED WELLS

11.12(1) Applicability for Hand-Pumped Wells

For groundwater systems with hand-pumped wells, the supplier must comply with the requirements specified in this rule unless otherwise determined by the Department.

(a) Only suppliers of transient non-community groundwater systems may operate hand-pumped wells.

11.12(2) Operating Requirements for Hand-Pumped Wells

(a) The supplier must operate and maintain hand-pumped wells in accordance with Department-approved hand-pumped well monitoring and operational criteria.

(i) The supplier must either submit criteria for Department approval or use the pre-approved criteria in the Department's Monitoring and Operational Guidance Handbook for Colorado Public Water Systems Utilizing Hand-Pumped Wells Which Do Not Provide Continuous Disinfection.

(b) The supplier must distribute a special public notice for hand-pumped wells.

(i) The supplier must post the special public notice on or within sight of the hand-pumped well whenever the well has the potential to supply water to the public.

(ii) The special public notice must include the following language and provide the specific information for the text in brackets:

(A) This hand pump serves unchlorinated well water. For more information, please contact [phone number of public water system owner, operator, or designee of the public water system].

(iii) The supplier must comply with the public notice requirements specified in 11.33(5)(e-f).

(c) For seasonally operated hand-pumped wells, the supplier must disinfect the well(s) no earlier than 30 days before opening for the season.

(d) For hand-pumped wells operated year-round, the supplier must disinfect the well(s) at least annually during the busiest month of operation.

11.12(3) Response to Hand-Pumped Well Sample Results

(a) If the result of any routine total coliform sample is positive for fecal coliforms or *E. coli* or a repeat total coliform sample is positive for total coliform, the supplier must:

(i) Close the hand-pumped well until a total coliform sample is absent of bacteria.

(ii) Disinfect the hand-pumped well before resuming operation.

11.13 GROUNDWATER RULE: DISINFECTION WAIVERS

11.13(1) Applicability for Disinfection Waivers

(a) The Department shall not approve new disinfection waivers.

(b) If the system has an existing disinfection waiver, the supplier must comply with the requirements specified in this rule.

(i) The supplier is not required to comply with the minimum residual disinfectant concentration requirements specified in 11.11(2).

11.13(2) Requirements for Maintaining a Disinfection Waiver

To maintain a disinfection waiver, the supplier must:

(a) Only supply water from groundwater sources.

(b) Distribute a special public notice regarding the disinfection waiver.

(i) For community water systems, the supplier must distribute the special public notice annually to inform consumers of the disinfection waiver.

(A) The supplier may use the consumer confidence report required under 11.34 to satisfy this requirement.

(ii) For non-community water systems, the supplier must continuously post the special public notice in conspicuous locations.

(iii) The special public notice must include the following language and provide the specific information for the text in brackets:

(A) [Name of groundwater system] has a waiver from disinfection requirements and serves well water that has not been chlorinated.

(iv) The supplier must comply with the public notice requirements specified in 11.33(5)(e-f).

(v) The Department may require the supplier to distribute the special public notice to new billing units or new customers as specified in 11.33(6)(b).

(c) Have the ability to provide a residual disinfectant concentration for the groundwater system in an emergency.

(i) The supplier must have Department-approved emergency disinfection equipment or be operating in accordance with the Department-approved emergency operating plan.

(d) Have a Department-approved monitoring plan that meets the requirements specified in 11.5.

(i) The supplier must operate in accordance with the Department-approved monitoring plan.

(e) Have a Department-approved distribution system protection plan.

(i) The supplier must operate in accordance with the Department-approved distribution system protection plan.

(ii) At a minimum, the distribution system protection plan must include all of the following:

(A) A description of protection measures designed to reduce public health risks for water provided through storage and the distribution system.

(B) A description of distribution system operation and maintenance practices (e.g., flushing schedules, scheduled upgrades, disinfection schedules);

(C) A backflow prevention and cross-connection control program that meets the requirements specified in 11.39.

(D) Identification of each potential point of entry for hazards and/or contaminants into the storage and distribution system and a description of the hazard and/or contaminant control measures to be used to mitigate the potential public health risks.

(E) A description of monitoring locations and parameters that will be used to verify and document that the hazard and/or contaminant control measures are effective.

(F) A description of incident response procedures to be followed in the case of a distribution system breach, hazard condition and/or contamination event. The procedure must at least include confirmation and repeat sampling protocols and flushing procedures.

(f) Have a Department-approved source water protection plan.

(i) The supplier must operate in accordance with the Department-approved source water protection plan.

(ii) At a minimum, the source water protection plan must include all of the following:

(A) A description of protection measures designed to reduce public health risks for water provided from groundwater sources.

(B) Delineation of source water protection areas.

(C) An inventory of potential sources of contamination.

(D) A plan for management of potential sources of contamination.

(E) Well failure emergency and contingency plans.

(F) Capacity development plan for new wells.

(G) A description of the methods to be used to involve and educate the public during the source water protection planning and implementation process.

(g) Keep records of chlorination activities as specified in 11.36(4)(c)(i)(C).

11.13(3) Disinfection Waiver Health-based Evaluations

(a) The Department may evaluate a groundwater system's wells and storage systems to determine if there are potential health risks from these sources. The Department shall conduct the evaluation based on criteria found in:

(i) Well construction and location criteria outlined in the rules, regulations, and Colorado statutes governing water well construction as enforced by the State Board of Examiners of Water Well and Pump Installation Contractors.

(ii) The State of Colorado Design Criteria for Potable Water Systems or other criteria developed by the Department.

(b) For new or existing sources, the Department may require assessment source water monitoring as specified in 11.11(5), additional testing, and additional information to establish that the water being supplied to the public is from a groundwater source determined to be free from microbial contamination.

(i) For new sources, the Department may require that all testing and evaluation be completed before the source may be used to supply water to the public.

(c) The Department may, at any time, conduct a full or partial sanitary survey to establish that the groundwater system is at low risk for contamination.

11.13(4) Disinfection Waiver Withdrawal

(a) A disinfection waiver may be withdrawn immediately if:

(i) The supplier fails to correct significant deficiencies as specified in 11.38(3).

(ii) The supplier fails to comply with 11.16 Revised Total Coliform Rule or a treatment technique for a Level 1 or Level 2 assessment is triggered under 11.16(8).

(iii) The supplier fails to comply with the triggered source water monitoring and reporting requirements specified in 11.11(4).

(iv) The supplier fails to comply with 11.39 Backflow Prevention and Cross-Connection Control Rule.

(v) There is an incidence of microbial disease, the source of which is reasonably identified by the Department as originating from consumption of drinking water from the groundwater system.

(vi) There is an occurrence of unforeseeable situations or conditions which are reasonably identified by the Department as having the potential to contribute to a microbial disease incident.

(vii) The supplier fails to have the system operated by qualified personnel who meet the requirements of Regulation 100, Water and Wastewater Facility Operators Certification Requirements, and are included in a State register of qualified operators.

(viii) The groundwater system is in violation of the *Colorado Primary Drinking Water Regulations*.

(ix) The groundwater system is not in compliance with all disinfection waiver requirements specified in 11.13(2), or if based on other information obtained, it appears that the water being supplied to the public presents a potential risk to public health.

(b) If the groundwater system has a source that has been determined by the Department to be fecally contaminated or is required to comply with the 4-log treatment of viruses requirements specified in 11.11(3), the waiver shall be withdrawn immediately.

11.13(5) Response to a Disinfection Waiver Withdrawal

(a) If the Department withdraws the disinfection waiver, the supplier must disinfect the groundwater and comply with the minimum disinfectant residual concentration requirements as specified in 11.11(2).

(b) The supplier may request a hearing to contest the withdrawal of the waiver. The request for such a hearing must be filed in writing no later than 60 days after service of the Department's withdrawal. The hearing must be conducted under the procedures established by Article 4 of Title 24, Colorado Revised Statutes.

11.14 DIRECT POTABLE REUSE RULE

11.14(1) Applicability and Definitions

(a) For all public water systems that utilize direct potable reuse, the supplier must comply with the requirements specified in this rule.

(b) Unless more stringent requirements are specified in this rule, the supplier must comply with requirements in Regulation 11 for a surface water system as defined in 11.3(83).

(i) The requirements of this rule constitute the regulations for direct potable reuse in addition to surface water treatment requirements specified in 11.8, 11.9, and 11.10.

(c) "ACTION LIMIT" means a limit at a critical control point that, when exceeded, triggers a response to prevent a potential human health hazard.

(d) "ADVANCED OXIDATION PROCESS" means a set of chemical treatment processes whereby oxidation of organic contaminants occurs on a molecular level through reactions with hydroxyl radicals or similarly aggressive radical oxidant species. The process breaks down recalcitrant organic molecules into smaller oxidized organic fragments.

(e) "ALERT LIMIT" means a limit at a critical control point that, when exceeded, alerts an operator that a potential problem may require a response.

(f) "BYPASS" means, for the purposes of direct potable reuse, the intentional diversion of waste streams from any portion of a non-domestic source's treatment facility.

(g) "CONSTITUENT(S) OF CONCERN" means potentially harmful or difficult to treat substances that could cause treatment interference, pass through, or a violation either of a treatment technique requirement or of an MCL specified in 11.45 in finished drinking water. Constituents of concern include target chemicals.

(h) "CRITICAL CONTROL POINT" means a treatment process or a portion of a treatment process designed to reduce, prevent, or eliminate a human health hazard.

(i) "CRITICAL CONTROL POINT MONITORING" means the approved parameters and methods used to monitor the effectiveness and status of treatment at each critical control point. Critical control point monitoring indicates whether the performance of the critical control point is achieving treatment goals. Action and alert limits must be associated with critical control point monitoring.

(j) "CRITICAL CONTROL POINT MONITORING LOCATION" means an approved location where effectiveness and status of each critical control point is monitored. Each critical control point must have at least one approved critical control point monitoring location.

(k) "DIRECT POTABLE REUSE" means using a series of processes that produce finished drinking water utilizing a source containing treated wastewater that has not passed through an environmental buffer.

(l) "ENVIRONMENTAL BUFFER" means either a surface water or groundwater aquifer that causes adequate dilution or natural attenuation of pathogenic and chemical contaminants. Wastewater effluent from a permitted (e.g. Colorado Discharge Permit System) wastewater treatment plant that has been discharged to a surface water body is considered to have passed through an environmental buffer. For new waterworks, the Department shall determine if a source containing wastewater effluent passes through an environmental buffer during review of plans and specifications in 11.4.

(m) "INDICATOR COMPOUND" means a chemical compound that has chemical properties that make it removable by some treatment processes but that may be recalcitrant to others. Indicator compounds are indicative of other compounds in that family of compounds and can be used to monitor the efficacy of removal of that group of compounds by a critical control point.

(n) "INTERFERENCE" means a discharge from a non-domestic source which alone or in conjunction with a discharge or discharges from other sources that inhibits or disrupts the supplier's treatment processes or operations that has a significant potential to have serious adverse effects on public health or to cause a violation either of a treatment technique requirement or of an MCL specified in 11.45 in finished drinking water.

(o) "METROPOLITAN SEWAGE DISPOSAL DISTRICT" means a district organized under Part 5, Article 4 of Title 32, Colorado Revised Statutes. A Metropolitan Sewage Disposal District is a type of wastewater entity.

(p) "NON-DOMESTIC SOURCE" means all industrial or commercial sources of wastewater to a wastewater treatment plant that are subject to National Pretreatment Standards and any other source that may adversely affect the waterwork's operation or has a significant potential to have serious adverse effects on public health or to cause a violation either of a treatment technique requirement or of an MCL specified in 11.45 in finished drinking water. Non-domestic source(s) that are determined to be Non-Significant pursuant to the criteria and procedures developed under 11.14(4)(a)(i)(B)(II) are exempt from individual permitting or other individual control mechanisms under the Enhanced Source Water Control Program.

(q) "OXIDIZED WASTEWATER" means wastewater in which the organic matter has been stabilized, is non-putrescible, and contains dissolved oxygen.

(r) "PASS THROUGH" means a condition where a constituent of concern enters the waterworks in quantities or concentrations that have a significant potential to have serious adverse effects on public health or to cause a violation either of a treatment technique requirement or of an MCL in finished drinking water as specified in 11.45.

(s) "RECALCITRANT TOTAL ORGANIC CARBON (rTOC)" means the total organic carbon (TOC) present in finished water that ultimately becomes treated wastewater. The recalcitrant TOC differs from anthropogenic TOC present in wastewater in that it may not be efficiently removed by the wastewater treatment plant and will be a component of the TOC in the treated wastewater.

(t) "TARGET CHEMICAL" means any unregulated chemical causing a potential human health concern that may be present in the treated wastewater.

(u) "TREATED WASTEWATER" means any water source from a wastewater treatment plant that has undergone a treated wastewater characterization for either enhanced wastewater treatment or secondary wastewater treatment as defined in the *Direct Potable Reuse Policy* and originates from a wastewater treatment plant that has liquid stream treatment processes that, at a minimum, are designed and operated to produce oxidized wastewater to achieve a defined source water quality for additional treatment by a supplier utilizing direct potable reuse.

(v) "WASTEWATER TREATMENT PLANT" means an arrangement of devices and structures for collecting, treating, neutralizing, stabilizing, or disposing of domestic wastewater, industrial wastes, and biosolids. For purposes of direct potable reuse, a wastewater treatment plant does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein.

11.14(2) Prior Approval Requirements

(a) The supplier may not commence direct potable reuse without prior written Department approval of an application for direct potable reuse, a technical, managerial, and financial capacity assessment using the criteria found in the *New Public Water System Capacity Planning Manual*, and plans and specifications for construction of new waterworks.

(b) The supplier must submit an application for direct potable reuse for Department approval prior to submission of plans and specifications for construction of new waterworks in accordance with 11.4(1)(b) for the direct potable reuse treatment facility. The application must contain all of the following:

(i) A communications and outreach plan to inform consumers of the direct potable reuse project with all of the elements specified in 11.14(3).

(A) The supplier must submit a copy of the public notification of the intent to apply for direct potable reuse along with certification that states that the supplier has fully complied with the notification requirements in 11.14(3)(a)(ii).

(ii) An enhanced source water control plan with all of the elements specified in 11.14(4). The plan provided with the application must include a copy of any agreement(s) with a wastewater entity to implement the enhanced source water control program.

(iii) A direct potable reuse operations plan with all of the elements specified in 11.14(5).

(iv) At least one year of monitoring results of the treated wastewater specified in 11.14(6)(b)(i)-(ii).

(c) Department written approval of an application for direct potable reuse shall specify conditions for the communications and public outreach program, the enhanced source water control program, and the direct potable reuse operations program.

11.14(3) Communications and Public Outreach Program

(a) Requirements for a Communications and Public Outreach Program

(i) The supplier must develop a written plan for a communications and public outreach program. The communications and public outreach program must be conducted in a manner that allows for meaningful involvement and fair treatment of Disproportionately Impacted (DI) communities, as defined in C.R.S. 24-4-109(2)(b)(II), or as approved by the Department. The written communications and public outreach plan must include information the supplier intends to distribute that includes at least all of the following content in language that is understandable to those without a technical background in the subject matter:

(A) The name, business address, and phone number for the supplier or designee that the consumer may contact for additional information about the direct potable reuse project.

(B) An explanation of what direct potable reuse is and the reasons for the supplier's implementation of direct potable reuse.

(C) A description and/or depiction of the supplier's proposed direct potable reuse project, including:

(I) The critical control points utilized to reduce pathogens and chemicals in accordance with 11.14(5)(a)(i)(E) and 11.14(5)(a)(i)(G).

(II) The critical control point monitoring and critical control point monitoring locations utilized within the direct potable reuse treatment plant in accordance with 11.14(5)(a)(i)(F), (H), and (I). The description must include how sampling at these monitoring locations is used to demonstrate effective reduction of pathogens, indicator compounds, and target chemicals.

(III) The alert and action limits. For action limit exceedances, a description must be included of the procedures for process shutdown or diversion, including provisions for an automated response, and must specify the fate of any water sent to waste in accordance with 11.14(5)(a)(i)(K).

(D) Identification of the wastewater treatment plant that serves as the source for the direct potable reuse project.

(E) The service area(s) that will be supplied with finished water from the direct potable reuse project.

(F) A statement that direct potable reuse is regulated by the Department under Regulation 11 and information on how to access Regulation 11.

(G) Other information as determined by the Department on a project-specific basis.

(ii) At least 60 calendar days prior to submitting an application for direct potable reuse, the supplier must notify by mail or by another Department-approved method all of its consumers of its intention to apply for and implement direct potable reuse. Prior to distribution of the notice, the supplier must make information specified in 11.14(3)(a)(i)(A-F) publicly available with the ability for consumers to provide public comment.

(b) Distribution of Communication and Public Outreach Materials.

(i) The supplier must deliver the information specified in 11.14(3)(a)(i) in all of the following methods:

(A) A local, publicly accessible repository that contains information including but not limited to the information required in 11.14(3)(a)(i) with a means for the public to submit questions and comments, obtain responses from the supplier and engage with the supplier. This repository must be active when the supplier complies with 11.14(3)(b)(i)(B).

(B) At least one notification by mail or by another Department-approved method to all of its consumers prior to the public meeting required by 11.14(3)(b)(i)(C).

(C) At least one public meeting must be held at least six months prior to serving finished water from direct potable reuse.

(D) At least one additional method as approved by the Department.

(E) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, for the information in 11.14(3)(a)(i)(A-G) that is distributed per 11.14(3)(b)(i)(A-D), the supplier must include either:

(I) Information in the appropriate language(s).

(II) A telephone number, email address or address where the consumer may contact the supplier to obtain a translated copy of written communication or request assistance in the appropriate language for written and oral communications.

(c) Reporting Requirements for Communications and Public Outreach Materials

(i) No later than 30 days before production of finished water from a direct potable reuse waterworks, the supplier must submit documentation to the Department that includes all of the following:

(A) A copy of the public outreach notices distributed in 11.14(3)(b)(i)(B) that meet the content requirements in 11.14(3)(a)(i).

(B) The date(s) and location(s) of public meeting(s).

(C) A description of the completed additional distribution method for public outreach approved by the Department in 11.14(3)(b)(i)(D).

(D) A description of how the supplier conducted outreach in a manner that allowed for meaningful involvement and fair treatment of Disproportionately Impacted (DI) communities, including a summary of engagement and responses from DI communities, if applicable.

(E) A certification that the supplier has fully complied with the communications and public outreach requirements.

(d) Violations for Communications and Public Outreach Program

(i) The following constitute communications and public outreach program violations:

(A) Failure to distribute materials as required in 11.14(3)(b).

(B) Failure to report materials as required in 11.14(3)(c).

(e) Response to Violations for Communications and Public Outreach Program

(i) In the event of a communications and public outreach program violation as specified in 11.14(3)(d), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 3 public notice as specified in 11.33.

11.14(4) Enhanced Source Water Control Program

(a) Requirements for an Enhanced Source Water Control Program

(i) The supplier must develop and maintain a written enhanced source water control program in accordance with the *Enhanced Source Water Control Program Policy*. The program must demonstrate how the supplier will reduce, eliminate, or alter the nature of constituents of concern including target chemicals in treated wastewater sufficient to meet the criteria for the critical control point monitoring ranges for direct potable reuse through the characterization of sources contributing to the influent of a wastewater treatment plant. At a minimum, the written enhanced source water control program must include all of the following information:

(A) The supplier's legal authority through written agreements, including applicable interagency agreements between the supplier and the wastewater entity to implement the enhanced source water control program; ordinances; and/or permits to ensure implementation of the enhanced source water control program, including an enforcement response plan and guide.

(B) The criteria and procedure(s) that will be used to:

(I) Develop and implement prohibitions, standards, and limits to protect the waterworks from interference, bypass, and pass through.

(II) Determine that a non-domestic source or group of non-domestic sources is "Non-Significant" upon a finding that the non-domestic source will not adversely affect operation of the waterworks, including pass through or interference, or has no significant potential to have serious adverse effects on public health or to cause a violation either of a treatment technique requirement or of an MCL specified in 11.45 in finished drinking water. Where a non-domestic source or group of non-domestic sources is determined to be "Non-Significant," the procedure must include documentation of agreement of the determination between the supplier and the wastewater treatment plant or metropolitan disposal district.

(C) Recordkeeping requirements for the wastewater treatment plant and non-domestic sources in addition to the Department's requirements.

(D) Legal authority to inspect, perform investigatory sampling, and access and copy relevant records of the wastewater treatment plant providing the treated wastewater, the non-domestic sources, and hauled wastes within or to the service area of the wastewater treatment plant.

(E) The process that will be used to identify and track contaminants of concern including a non-domestic source inventory, a chemical inventory, and a review of the wastewater treatment plant's hauled waste program. The process shall include tracking of monitoring, inspection and enforcement activities used to control sources of contaminants of concern.

(F) A legally enforceable response plan for source water quality deviations.

(G) Where applicable, a description of how the enhanced source water control program will be implemented by the wastewater entity through its approved pretreatment program or equivalent NPDES or CDPS discharge permit program, as set forth in 11.14(4)(a)(ii)(A-B).

(H) Where applicable, a description of the specific procedures, including required timeframes, for the wastewater entity implementing the enhanced source water control program to provide the supplier with notifications of new or substantially changed pollutants from non-domestic sources as set forth in 11.14(4)(a)(vi).

(ii) The supplier must ensure the enhanced source water control program is properly implemented and specify to the Department the entity that will implement each element of the program in accordance with the *Enhanced Source Water Control Program Policy*. Implementation will depend upon the wastewater treatment plant or metropolitan sewage disposal district that provides treated wastewater for direct potable reuse. The supplier must specify in the enhanced source water control program how the program will be implemented based on the criteria below.

(A) If the wastewater treatment plant or metropolitan sewage disposal district that provides treated wastewater has an approved national pretreatment program that meets the requirements of 40 CFR Part 403 (General Pretreatment Regulations for Existing and New Sources of Pollution), the supplier must ensure that the wastewater entity or metropolitan sewage disposal district implements the enhanced source water control program in conjunction with its approved pretreatment program. Agreements must be provided to the Department specifying how the wastewater treatment plant or metropolitan sewage disposal district will implement enhanced source water control on behalf of the supplier, including identifying elements of the approved pretreatment program that will be used for enhanced source water control.

(B) If the wastewater treatment plant or metropolitan sewage disposal district that provides treated wastewater has a NPDES or CDPS discharge permit, but does not have an approved national pretreatment program that meets the requirements of 40 CFR Part 403 (General Pretreatment Regulations for Existing and New Sources of Pollution), then the supplier must ensure that the enhanced source water control program is implemented by the permit holder in coordination with the supplier and contains equivalent components to an approved national pretreatment program as applicable to enhanced source water control. The supplier shall confirm that the discharge permit includes required prohibited discharges and categorical pretreatment standards from 40 CFR Part 403 (General Pretreatment Regulations for Existing and New Sources of Pollution).

(C) If the wastewater treatment plant or metropolitan sewage disposal district that provides treated wastewater does not have a NPDES or CDPS discharge permit, then the supplier must establish and implement the enhanced source water control program in its entirety. The supplier shall ensure that the enhanced source water control program contains equivalent components to an approved national pretreatment program under 40 CFR Part 403 (General Pretreatment Regulations for Existing and New Sources of Pollution) as applicable to enhanced source water control, including prohibited discharges and categorical pretreatment standards.

(iii) The supplier must submit for Department review and approval any significant modifications to the previously approved enhanced source water control program prior to implementing such modifications.

(iv) At a minimum, the supplier must review and update the written enhanced source water control program at least every three years, or on a frequency determined by the Department based on changes within the service area of the wastewater treatment plant or the presence of contaminants of concern not adequately addressed in the existing program. The enhanced source water control program must be signed and dated by the authorized signatories of the supplier and the wastewater entity or metropolitan sewage disposal district.

(v) The Department may request, review, or require revisions to the supplier's written enhanced source water control program. The supplier must demonstrate that the written enhanced source water control program is being implemented by maintaining legal authority to direct, access and maintain records of all activities necessary for implementation of the written enhanced source water control program.

(vi) The supplier shall require all non-domestic sources that are subject to the enhanced source water control program to notify the entity implementing the enhanced source water control program of any new introductions of pollutants by new or existing non-domestic sources or any substantial change in pollutants from any non-domestic sources no later than 30 calendar days before the introduction or change. Such notice must identify:

(A) Any substantial change in the volume or character of pollutants being introduced into the wastewater collection system by any non-domestic source.

(B) The identity of the non-domestic source.

(C) The nature and concentration of pollutants in the discharge that could cause pass through or interference.

(D) The average and maximum flow of the discharge to be introduced into the wastewater collection system.

(E) The supplier must document any anticipated impact of the change on the quantity or quality of treated wastewater to be received by the waterworks.

(vii) The supplier must submit an annual enhanced source water control program report documenting program status and activities during the previous calendar year by no later than May 1st of each calendar year. The report must include all of the following:

(A) A summary of the status of non-domestic source compliance during the reporting period.

(B) A summary of compliance and enforcement activities, including inspections, conducted by the supplier during the reporting period.

(C) A current inventory of non-domestic sources that contribute to constituents of concern.

(b) Violations for Enhanced Source Water Control

(i) The following constitute enhanced source water control program violations:

(A) Failure to maintain or implement the approved enhanced source water control program.

(B) Failure to submit an enhanced source water control program report as specified in 11.14(4)(a)(vii).

(c) Response to Violations for Enhanced Source Water Control

(i) In the event of an enhanced source water control program violation as specified in 11.14(4)(b), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 3 public notice as specified in 11.33.

11.14(5) Direct Potable Reuse Operations Program

(a) Requirements for a Direct Potable Reuse Operations Program

(i) The supplier must develop a written plan for a direct potable reuse operations program that demonstrates how the supplier or wastewater entity will operate wastewater treatment processes and direct potable reuse to deliver finished water that meets the pathogen and chemical reduction treatment technique requirements in 11.14(7) and 11.14(8). At a minimum, the direct potable reuse operations program must include all of the following:

(A) Certification that the water and wastewater systems are operated by certified operators at the appropriate certification levels for each facility.

(B) A communications plan describing the schedule and method for communications between water and wastewater operators.

(C) A preliminary operations manual that details standard operating protocols at the wastewater system, water treatment system, and water distribution system.

(D) A characterization of the treated wastewater based on monitoring under 11.14(6)(b) to identify alert and action limits prior to the water treatment plant.

(E) Identification of each critical control point for pathogen reduction to comply with 11.14(7).

(F) Identification of critical control point monitoring and critical control point monitoring locations to be monitored to evaluate the effectiveness of critical control points for pathogen reduction.

(G) Identification of each critical control point for chemical reduction to comply with 11.14(8).

(H) The identification of indicator compounds, critical control point monitoring, and critical control point monitoring locations that indicate whether treatment goals at each critical control point for chemical reduction are being met.

(I) Identification of target chemicals that are present in treated wastewater and targeted for removal or reduction. The supplier must specify targeted removal rates to be removed at each critical control point.

(J) Identification of critical control point monitoring and critical control point monitoring locations to be monitored to evaluate the effectiveness of critical control points for chemical reduction.

(K) Identification of alert limits and action limits at each critical control point with an associated action plan with deadlines for addressing alert limit and action limit exceedances. For action limit exceedances, procedures must include but not be limited to provisions for process shutdown or diversion, including provisions for an automated response, and must specify the fate of any water sent to waste.

(L) A direct potable reuse process schematic that identifies each critical control point for pathogen and chemical reduction and the critical control point for treated wastewater within the wastewater treatment plant.

(M) Identification of a critical control point dashboard that allows for online monitoring for display to the supplier's wastewater and water treatment operator(s).

(N) A communications plan describing how the supplier will maintain the following forms of communication with the public:

(I) The local, publicly accessible repository of information required in 11.14(3)(b)(i)(A).

(II) The methods and frequency for continued communications with the public about direct potable reuse operations, status, and water quality, including situations requiring public notice under 11.33.

(ii) The supplier may develop a microbial risk assessment of its treated wastewater based on pathogen monitoring as defined in the *Direct Potable Reuse Policy*. After completion of the assessment, the Department may approve treatment technique requirements for pathogen reduction less than those specified in 11.14(7)(b)(ii) but not less than those specified in 11.14(7)(b)(iii).

(iii) The supplier must submit for Department review and approval any significant modifications to the previously approved direct potable reuse operations program prior to initiating such modifications.

(iv) The Department may request, review, or require revisions to the supplier's written direct potable reuse operations program.

(b) Violations for Direct Potable Reuse Operations Program

(i) The following constitutes direct potable reuse operations program violations:

(A) Failure to maintain or implement the direct potable reuse operations program.

(c) Response to Violations for Direct Potable Reuse Operations Program

(i) In the event of a direct potable reuse operations program violation as specified in 11.14(5)(b)(i), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 3 public notice as specified in 11.33.

11.14(6) Treated Wastewater Control

(a) Requirements for Treated Wastewater Control

(i) The supplier must regularly verify that the treated wastewater is within Department-approved action limits or that corresponding corrective actions are taken within the approved timeframe.

(b) Monitoring Requirements for Treated Wastewater Control

(i) Prior to submitting an application for direct potable reuse, the supplier must ensure monitoring occurs at a critical control point monitoring location. The supplier and wastewater entity can determine through agreement how the parties will effectuate the monitoring requirements. The monitoring must occur at a critical control point representing treated wastewater for all of the following:

(A) Continuously monitor and record the monitoring results at least every 15 minutes for the following parameters for 12 consecutive months.

(I) Ammonia.

(II) Conductivity.

(III) pH and temperature.

(IV) Turbidity.

(V) Ultraviolet absorption, in 1/m, at a wavelength of 254 nm (i.e., UV254) that has been correlated with Total Organic Carbon (TOC).

(VI) Flow rate of treated wastewater.

(B) Monitor at least one sample each month for 12 consecutive months for the following parameters:

(I) Nitrate and nitrite.

(II) Inorganic chemicals specified in 11.19(2).

(III) Organic chemicals specified in 11.21(2).

(IV) Radionuclides specified in 11.22(2).

(V) Disinfection byproducts specified in 11.25(1).

(VI) Lead and copper.

(ii) Prior to submitting an application for direct potable reuse, the supplier must monitor within the distribution system at locations defined in the *Direct Potable Reuse Policy* once per month for 12 consecutive months for TOC in order to determine the recalcitrant total organic carbon (rTOC).

(iii) While operating direct potable reuse, the supplier must ensure monitoring occurs at an approved critical control point monitoring location. The supplier and wastewater entity can determine through agreement how the parties will effectuate the monitoring requirements. The monitoring must occur at a critical control point representing treated wastewater for all of the following:

(A) Continuously monitor and record the monitoring results at least every 15 minutes for the following parameters:

(I) Ammonia.

(II) Conductivity.

(III) pH.

(IV) Turbidity.

(V) UV254 that has been correlated with TOC.

(VI) Flow rate of treated wastewater.

(VII) Other parameters, as determined by the Department.

(B) Monitor at least one sample each month for the following parameters:

(I) Nitrate and nitrite.

(II) Other parameters, as determined by the Department.

(C) Monitor at least one sample each year for parameters as determined by the Department based on the monitoring results in 11.14(6)(b)(i)(B).

(iv) While operating direct potable reuse, the supplier must monitor in the distribution system once per month for TOC at Department-approved locations in order to verify the recalcitrant TOC.

(c) Violations for Treated Wastewater Control

(i) The following constitutes treatment technique violations of the treated wastewater control:

(A) Production of finished water through direct potable reuse when an action limit is exceeded at the treated wastewater critical control point for more than the Department-approved corrective action timeframe.

(d) Response to Violations for Treated Wastewater

(i) In the event of a treated wastewater treatment technique violation as specified in 11.14(6)(c)(i), the supplier must:

(A) Notify the Department no later than the end of the next business day.

(B) Distribute Tier 2 public notice as specified in 11.33.

(e) Reporting Requirements for Treated Wastewater Critical Control Point

(i) No later than the 10th of the month following the end of each month, the supplier must submit the following:

(A) Action limit exceedances and corrective action taken within the approved timeframe.

(B) Alert limit exceedances and corrective action taken within the approved timeframe.

(ii) No later than the 10th of the month following the end of each calendar year, the supplier must submit the following:

(A) A summary of results of continuously monitored parameters, including median, mean, and 25^{th} and 75^{th} percentiles compiled on a monthly basis for each parameter under 11.14(6)(b)(iii)(A).

(B) All sample results monitored during the calendar year under 11.14(6)(b)(iii)(B-C).

11.14(7) Treatment Technique Requirements for Pathogen Reduction

(a) Applicability for Treatment Technique Requirements for Pathogen Reduction

(i) For all public water systems that utilize direct potable reuse, the supplier must comply with the treatment technique requirements at critical control points for pathogen reduction, and entry point and distribution residual disinfectant concentrations specified in this section, 11.14(7).

(b) Treatment Technique Requirements for Pathogen Reduction

(i) The supplier must utilize a minimum of three separate critical control points for pathogen reduction. Two of the critical control points for pathogen reduction must consist of one disinfection critical control point and one filtration critical control point from the following:

(A) A disinfection critical control point consisting of UV or ozone.

(B) A filtration critical control point consisting of one of the following:

(I) Reverse osmosis.

(II) Conventional or direct filtration in accordance with criteria specified in the *Direct Potable Reuse Policy and Policy* DW-005. Ozone/biofiltration is considered direct or conventional filtration.

(III) A Department-approved alternative filtration in accordance with criteria specified in the *Direct Potable Reuse Policy*, Policy DW-004, DW-005 and 11.10(5).

(ii) Unless the Department has approved alternative treatment requirements based on treated wastewater characterization in 11.14(5)(a)(ii), the sum of the log reduction values across the pathogen critical control points specified in 11.14(7) must reliably be at least:

(A) 10-log treatment of *Cryptosporidium*.

(B) 10-log treatment of *Giardia lamblia*.

(C) 12-log treatment of viruses.

(iii) If the Department has approved alternative treatment requirements based on treated wastewater characterization in 11.14(5)(a)(ii), the sum of the log reduction values across the pathogen critical control points specified in 11.14(7) shall not be less than:

(A) 5.5-log treatment of *Cryptosporidium*.

(B) 6-log treatment of *Giardia lamblia*.

(C) 8-log treatment of viruses.

(iv) The Department shall approve log reduction credits for each pathogen critical control point in accordance with criteria specified in 11.10(5) and Policy DW-004 and DW-005.

(A) Each filtration critical control point shall receive no more than 6-log treatment removal credit for viruses, *Giardia lamblia*, or *Cryptosporidium*.

(v) The maximum demonstrated log inactivation for viruses, *Giardia lamblia*, or *Cryptosporidium* is 6-log inactivation at each disinfection critical control point.

(vi) The supplier must meet the filtration treatment technique requirements specified in 11.8(2)(b).

(vii) The supplier must meet the entry point and distribution system disinfection treatment technique requirements specified in 11.8(3)(b)(i)(B).

(c) Monitoring Requirements for Pathogen Reduction

(i) To determine compliance with the treatment technique requirements for critical control points for pathogen reduction, the supplier must comply with the sampling requirements specified in this section, 11.14(7)(c).

(A) For systems using conventional or direct filtration:

(I) To determine compliance with the combined filter effluent treatment technique requirements specified in 11.8(2)(c)(i) the supplier must monitor turbidity continuously at a location(s) representative of the combined filter effluent and validate the continuous monitoring equipment for accuracy at a Department-approved frequency and using a Department-approved method.

(II) The supplier must monitor turbidity continuously at locations representative of each individual filter effluent as specified in 11.8(2)(g).

(B) For systems using membrane or reverse osmosis filtration, the supplier must measure the following:

(I) To determine compliance with the combined filter effluent treatment technique requirements specified in 11.8(2)(c)(i) the supplier must monitor turbidity continuously at a location(s) representative of the combined filter effluent and validate the continuous monitoring equipment for accuracy at a Department-approved frequency and using a Department-approved method.

(II) The supplier must monitor its membrane filtration as specified in 11.10(5)(j).

(C) To determine compliance with the disinfection treatment technique requirements at each critical control point for pathogen reduction, the supplier must monitor the following:

(I) For systems using chlorine, chlorine dioxide, or ozone, the supplier must monitor parameters to summarize or validate the achieved log inactivation at each pathogen critical control point at least every four hours.

(II) For systems using UV, the supplier must continuously monitor all of the following:

(a) UV intensity as measured by a UV sensor.

(i) The supplier must verify the calibration of UV sensors and must recalibrate sensors in accordance with a Department-approved protocol.

(b) UV transmittance.

(c) Lamp status.

(d) Flow rate.

(e) Other parameters the Department designates based on UV reactor operation.

(III) At each entry point, the supplier must continuously monitor the residual disinfectant concentration.

(a) The supplier must record the lowest monitoring result each day.

(b) If there is a failure of the continuous monitoring equipment, the supplier must monitor the residual disinfectant concentration by collecting a grab sample no later than four hours after the equipment failure and continue collecting grab samples every four hours until the continuous monitoring equipment is returned to service.

(i) The supplier must resume continuous residual disinfectant concentration monitoring no later than five working days after the equipment failure.

(IV) The supplier must monitor residual disinfectant concentration in the distribution system according to 11.8(3)(c)(i)(B).

(d) Treatment Technique Violations for Pathogen Reduction

(i) The following constitute pathogen reduction treatment technique violations:

(A) Violations for combined filter effluent as specified in 11.8(2)(d)(i)(A).

(B) Violations for disinfection as specified in 11.8(3)(d)(i).

(C) Production of finished water through direct potable reuse when an action limit is exceeded at a critical control point for pathogen reduction for more than a Department-approved corrective action timeframe.

(D) At the entry point, based on the total pathogen reduction and inactivation treatment, the required log reduction credit for *Cryptosporidium*, *Giardia lamblia*, or viruses is not met for more than four hours.

(E) Violations for combined filter effluent as specified in 11.8(2)(d)(i)(B).

(e) Response to Treatment Technique Violations for Pathogen Reduction

(i) In the event of a pathogen reduction treatment technique violation, as specified in 11.14(7)(d)(i)(A-C), the supplier must:

(A) Notify the Department no later than the end of the next business day.

(B) Distribute Tier 2 public notice as specified in 11.33.

(ii) In the event of a pathogen treatment technique violation, as specified in 11.14(7)(d)(i)(D), the supplier must:

(A) Notify the Department as soon as possible but no later than 24 hours after the violation occurs.

(B) Distribute Tier 1 public notice as specified in 11.33.

(iii) In the event of a maximum combined filter effluent turbidity limit treatment technique violation, as specified in 11.14(7)(d)(i)(E), the supplier must consult with the Department as soon as possible but no later than 24 hours after the violation occurs.

(A) The Department shall determine from the consultation whether Tier 1 or Tier 2 public notice is required to protect public health. The supplier must distribute public notice as specified by the Department.

(B) If the supplier fails to consult with the Department within 24 hours, the supplier must distribute Tier 1 public notice, as specified in 11.33, for the violation.

(f) Reporting Requirements for Pathogen Reduction

(i) If at any time the pathogen reduction values are less than the required levels, the supplier must notify the Department as soon as possible, but no later than the end of the next business day after the supplier learns of the situation.

(A) The supplier must also report, no later than the end of the next business day, whether the log removal and inactivation treatment was restored to at least required levels within four hours.

(ii) The supplier must submit all of the following monitoring results required under 11.14(7)(c) or calculations no later than the 10th of the following month:

(A) For combined filter effluent turbidity monitoring results, the supplier must submit the following information:

(I) Number of combined filter effluent turbidity monitoring results recorded during the month.

(II) Number and percentage of combined filter effluent turbidity monitoring results recorded during the month that were greater than (>) the 95th percentile turbidity limit specified in 11.8(2)(b).

(III) The date and value of any combined filter effluent turbidity monitoring results collected during the month which were greater than (>) the maximum turbidity limit.

(IV) The value of the highest combined filter effluent turbidity monitoring result during each four-hour period and day during the month.

(B) For systems using membrane or reverse osmosis filtration, the supplier must submit a monthly report summarizing direct and indirect integrity tests as specified in 11.10(5)(j)(iii-iv).

(C) For systems using chlorine dioxide, the calculated daily chlorine dioxide CT values as specified in 11.10(5)(m)(i) using Table 11.10-VI to determine the *Cryptosporidium* treatment log credit achieved by chlorine dioxide for the applicable water temperature.

(D) For systems using ozone treatment, the calculated daily ozone CT values as specified in 11.10(5)(m)(i) and Table 11.10-VII to determine the *Cryptosporidium* treatment log credit achieved by the ozone treatment for the applicable water temperature.

(E) For systems using UV reactors, the percent of water supplied to the public during the month that was treated by a UV disinfection process within validated operating conditions for the required UV dose.

(F) For each entry point, the lowest daily residual disinfectant concentration result in mg/L.

(G) For each disinfection pathogen critical control point, the supplier must report the lowest achieved log reduction for *Cryptosporidium*, *Giardia lamblia*, and viruses for each four-hour period and day during the month

(H) For each entry point, the supplier must report the lowest total achieved log reduction for *Cryptosporidium*, *Giardia lamblia*, and viruses for each four-hour period and day during the month.

(I) Action limit exceedances and corrective action taken within the approved timeframe.

(J) Alert limit exceedances and corrective action taken within the approved timeframe.

(iii) The supplier must submit all of the following documentation no later than the 10th of the following month:

(A) Documentation that the individual filter effluent turbidity monitoring was conducted.

(B) The date and duration of each period when the entry point residual disinfectant concentration fell below 0.2 mg/L and when the Department was notified of the occurrence.

(C) For distribution system residual disinfectant concentration samples:

(I) The number of sample results that were less than (<) 0.2 mg/L.

(II) The percentage of sample results that were less than (<) 0.2 mg/L for each of the last two months.

11.14(8) Treatment Technique Requirements for Chemical Reduction

(a) Applicability for Treatment Technique Requirements for Chemical Reduction

(i) For all public water systems that utilize direct potable reuse, the supplier must comply with the treatment technique requirements for chemical critical control points specified in this section, 11.14(8).

(b) Treatment Technique Requirements for Chemical Reduction

(i) The supplier must utilize chemical critical control points. At a minimum, the supplier must utilize the following:

(A) An advanced oxidation process, combined with at least one of the following:

(I) Reverse osmosis.

(II) Two different critical control points consisting of an adsorption process (e.g. granular activated carbon) and an additional critical control point as approved by the Department.

(ii) At each critical control point monitoring location for chemical reduction, the supplier must demonstrate that specified removal rates for Department-specified indicator compounds have been achieved.

(A) The Department may require additional demonstration of adequate reduction of Department-specified chemicals present in treated wastewater in accordance with Department approval.

(iii) The supplier must take the appropriate corrective action within a Department-approved timeframe when an alert limit or action limit is exceeded at a chemical critical control point.

(iv) At the final critical control point monitoring location for chemical reduction, the supplier must determine if an alert limit or action limit exceedance for TOC has occurred.

(A) The supplier may use UV254 in lieu of TOC for determining if an alert limit or action limit exceedance for TOC has occurred.

(B) The TOC alert limit is the 75th percentile of recalcitrant TOC.

(I) When an alert limit for TOC is exceeded, the supplier must initiate alert limit protocols in their direct potable reuse operations program to investigate the cause.

(C) The TOC action limit is 1.5 times the 95th percentile of recalcitrant TOC.

(I) When an action limit for TOC is exceeded, the supplier must initiate action limit protocols within 72 hours specified in their direct potable reuse operations plan to investigate the cause and complete necessary actions to resolve the situation.

(c) Monitoring Requirements for Chemical Reduction

(i) For systems that meet the applicability of this rule, the supplier must comply with the sampling requirements to determine compliance with the MCLs as specified in 11.18, 11.19, 11.21, 11.22.

(ii) At each critical control point monitoring location for chemical reduction, the supplier must continuously monitor for the following and record the monitoring results at least every 15 minutes:

(A) Critical control point monitoring identified in the supplier's written direct potable reuse operations plan.

(B) Instantaneous flow rate.

(iii) To determine compliance with the chemical reduction treatment technique requirements, the supplier must monitor the following:

(A) The supplier must sample for one or more indicator compounds required in 11.14(5)(a)(i)(H) as approved by the Department at each critical control point monitoring location for chemical reduction each month for 12 consecutive months.

(I) The Department may reduce the sampling frequency to once per quarter after the first year of operation.

(B) Downstream of the final chemical critical control point, the supplier must monitor the TOC concentration at least every four hours.

(I) The supplier must record the median TOC value during each month.

(II) The supplier may monitor UV254 in lieu of TOC as approved by the Department.

(d) Treatment Technique Violations for Chemical Reduction

(i) The following constitute chemical reduction treatment technique violations:

(A) The supplier exceeds an action limit for indicator compounds and has not completed corrective action at the critical control point within 90 days or by a Department-approved deadline.

(B) The supplier does not achieve approved critical control point monitoring set points and has not completed corrective action at the critical control point within 90 days or by a Department-approved deadline.

(C) Failure to initiate action limit protocols specified in the supplier's direct potable reuse operations plan to investigate the cause or complete necessary actions to resolve the recalcitrant TOC removal by a Department-approved deadline.

(e) Response to Treatment Technique Violations for Chemical Reduction

(i) In the event of a chemical reduction treatment technique violation as specified in 11.14(8)(d), the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(f) Reporting Requirements for Chemical Reduction

(i) For chemical reduction monitoring results collected under 11.14(8)(c), the supplier must submit the following information no later than the 10th of the month following the end of each monitoring period:

(A) Action limit exceedances and corrective action taken within the approved timeframe.

(B) Alert limit exceedances and corrective action taken within the approved timeframe.

11.15 RESERVED

11.16 REVISED TOTAL COLIFORM RULE

(a) The requirements of this section constitute the regulations for total coliforms and *E. coli*. This regulation establishes a maximum contaminant level and treatment technique requirements.

11.16(1) Applicability and Definitions

(a) All public water systems must comply with the requirements specified in this rule, unless otherwise specified.

(b) "CLEAN COMPLIANCE HISTORY" means a record of no MCL violations under 11.45(1), no sampling violations under 11.16, and no treatment technique triggers or treatment technique violations under 11.16 for a minimum of 12 months.

(c) Failure to comply with the applicable requirements of 11.16 is a violation of the Colorado Primary Drinking Water Regulations.

(d) The supplier must have the system operated by qualified personnel who meet the requirements of Regulation 100, the *Water and Wastewater Facility Operators Certification Requirements*.

11.16(2) Analytical Methods and Laboratory Certification

(a) Suppliers must analyze all compliance samples, required by 11.16 and 11.46(2), using a Department-certified laboratory using a certified method.

11.16(3) Sample Siting Plan Requirements

(a) As part of the monitoring plan specified in 11.5, the supplier must develop a written sample siting plan, pursuant to 11.16(4) and 11.16(5), that identifies all of the following:

(i) Sampling sites and a sample collection schedule that are representative of water throughout the distribution system. The supplier must collect total coliform samples according to the written sample siting plan. Monitoring locations may include a customer's premises, dedicated sampling station, or other designated compliance sampling site. The sample siting plan must include routine and repeat sample sites and any other sampling sites necessary to meet the requirements of 11.11.

(ii) Suppliers must identify repeat sample sites in the sample siting plan. Unless the requirements of 11.16(3)(a)(ii)(A) or 11.16(4)(a)(v)(A) are met, the supplier must collect at least one repeat total coliform sample at the site where the original total coliform-positive sample was collected, at least one repeat total coliform sample at a site within five service connections upstream from the site where the original total-coliform positive sample was collected, and at least one repeat total coliform sample at a site within five service connections downstream from the site where the original total-coliform positive sample was collected.

(A) Alternatively, suppliers may propose repeat monitoring locations to the Department that the supplier believes to be more representative of a pathway for contamination of the distribution system. A supplier may elect to:

(I) Identify alternative fixed repeat sampling sites that the supplier believes to be representative of a pathway for contamination of the distribution system; or

(II) Develop criteria for selecting repeat sampling sites on a situational basis that the supplier believes to best verify and determine the extent of potential contamination and a potential pathway for contamination of the distribution system in a standard operating procedure (SOP) that is included in the sampling plan. The Department may modify the SOP or require alternative repeat sampling sites.

(B) If the supplier collected the original total coliform-positive sample from the end of the distribution system or one site away from the end of the distribution system, the Department may allow an alternative sampling site for collecting repeat samples at the upstream or downstream sites.

(iii) The Department may review, revise, and approve the written sample siting plan, as specified in 11.16(3). The supplier must demonstrate that the sample siting plan remains representative of the water quality in the distribution system.

11.16(4) Sampling Requirements

(a) To determine compliance with the MCL for *E. coli* or to determine if a treatment technique is triggered, the supplier must collect total coliform samples as specified in the supplier's sample siting plan in 11.16(3) and as specified in 11.16(4) and 11.16(5).

(i) The supplier must collect total coliform samples at regular time intervals throughout the month, except:

(A) For groundwater systems that supply less than or equal to (≤) 4,900 people, the supplier may collect all required samples on a single day if the samples are collected from different sites.

(ii) The supplier may collect more samples than the minimum number of routine total coliform samples required as specified in Table 11.16-I as a tool to investigate potential problems in the distribution system.

(A) The supplier must use these sample results to determine if a coliform treatment technique in 11.16(8)(a)(i) or 11.16(8)(a)(ii) has been triggered if the supplier collects these samples in accordance with the sample siting plan and are representative of water throughout the distribution system.

(iii) If any of the sample results collected under 11.16(4) are total coliform-positive, the supplier must comply with the repeat monitoring requirements in 11.16(5) and *E. coli* analytical requirements in 11.16(4)(e).

(iv) The supplier is not required to submit special purpose samples, as defined in 11.2(5)(78) unless the sample result is *E. coli*-positive and is representative of water in the distribution system. The supplier must submit *E. coli*-positive special purpose sample results to the Department as specified in 11.35(2)(a).

(v) If an *E. coli* MCL violation occurs under 11.16(11) or if a coliform treatment technique is triggered under 11.16(8), the supplier must still collect at least the minimum number of required samples.

(vi) For groundwater systems, the supplier must collect triggered source water monitoring samples as specified in 11.11(4) in addition to repeat samples required in 11.16(5).

(A) For a groundwater system with a single well supplying less than or equal to (≤) 1,000 people, if the supplier is required to collect a triggered source water monitoring sample, the supplier, with written Department approval, may collect one of the repeat total coliform samples at the sample site required for triggered source water monitoring under 11.11(4), if the supplier demonstrates to the Department's satisfaction that the sample siting plan remains representative of water quality in the distribution system.

(I) If approved by the Department, the supplier may use the repeat total coliform sample to meet both the triggered source water monitoring requirements specified in 11.11(4) and the total coliform repeat sampling requirements specified in this section, 11.16(5).

(II) If the repeat sample collected from the groundwater source is *E. coli*-positive, the supplier must comply with the requirements in 11.11(4).

(b) Routine Sampling Requirements for Total Coliform

(i) For all public water systems, the supplier must collect the number of routine total coliform samples specified in Table 11.16-I each month except:

(A) For non-community groundwater systems that supply less than or equal to (≤) 1,000 people, the supplier must collect one total coliform sample during each quarter that water is supplied to the public, unless the supplier is required to increase the routine sampling frequency as specified in 11.16(4)(c).

(I) In any month where the system supplies greater than (>) 1,000 people, the supplier must collect the number of routine total coliform samples specified in Table 11.16-I each month.

(a) The supplier must have written Department-approval to alternate between quarterly and monthly sampling frequencies based on when the population supplied is less than or equal to (≤) 1,000 people or when the population supplied is greater than (>) 1,000 people.

(ii) For public water systems that haul water, the water hauler must collect at least one total coliform sample from the outlet port of each tank or container each month that the tank or container is used to supply water to the public.

(iii) For hand-pumped wells, the supplier must collect at least one total coliform sample from each hand-pumped well each month that it supplies water to the public.

(iv) For the following public water systems, the supplier is not eligible for a quarterly sampling frequency as specified in 11.16(4)(b)(i)(A):

(A) Seasonal systems.

(B) Public water systems that do not provide chemical disinfection.

(C) Public water systems that haul water.

(D) Groundwater systems with hand-pumped wells.

(v) The Department must perform a special monitoring evaluation during each sanitary survey to review the status of the system, including the distribution system, and determine whether the supplier is on an appropriate monitoring schedule.

(A) Based on the Department's special monitoring evaluation, the Department may modify the Supplier's monitoring schedule, consistent with 11.16(4) and 11.16(5)..

TABLE 11.16-I NUMBER OF ROUTINE TOTAL COLIFORM SAMPLES REQUIRED PER MONITORING PERIOD

Population supplied	Minimum number of samples required	Population supplied	Minimum number of samples required
25 to 1,000[1]	1	59,001 to 70,000	70
1,001 to 2,500	2	70,001 to 83,000	80
2,501 to 3,300	3	83,001 to 96,000	90
3,301 to 4,100	4	96,001 to 130,000	100
4,101 to 4,900	5	130,001 to 220,000	120
4,901 to 5,800	6	220,001 to 320,000	150
5,801 to 6,700	7	320,001 to 450,000	180
6,701 to 7,600	8	450,001 to 600,000	210
7,601 to 8,500	9	600,001 to 780,000	240
8,501 to 12,900	10	780,001 to 970,000	270
12,901 to 17,200	15	970,001 to 1,230,000	300
17,201 to 21,500	20	1,230,001 to 1,520,000	330
21,501 to 25,000	25	1,520,001 to 1,850,000	360

TABLE 11.16-I NUMBER OF ROUTINE TOTAL COLIFORM SAMPLES REQUIRED PER MONITORING PERIOD			
Population supplied	Minimum number of samples required	Population supplied	Minimum number of samples required
25,001 to 33,000	30	1,850,001 to 2,270,000	390
33,001 to 41,000	40	2,270,001 to 3,020,000	420
41,001 to 50,000	50	3,020,001 to 3,960,000	450
50,001 to 59,000	60	3,960,001 or more	480

1 Includes systems that have greater than or equal to (≥) 15 service connections, but supply less than (<) 25 people.

(c) For Non-community Groundwater Systems Supplying Less Than or Equal to (≤) 1,000 People – Increased Routine Sampling Requirements for Total Coliform

(i) If the supplier is sampling quarterly, the supplier must increase the routine sampling frequency to monthly if any of the following events occur:

(A) The supplier triggers a Level 2 assessment or two Level 1 assessments under 11.16(8) that occur within a rolling 12-month period.

(B) A total coliform treatment technique violation occurs.

(C) Two sampling violations under 11.16occur in a rolling 12-month period.

(D) A Level 1 assessment is triggered and a sampling violation of 11.16 occurs within a rolling12-month period.

(E) The supplier receives an *E. coli* MCL violation.

(ii) The supplier must begin the monthly sampling frequency in the month following the month that the event occurred under 11.16(4)(c)(i).

(iii) If the supplier is sampling monthly, the Department may allow the supplier to return to a routine quarterly sampling frequency if all of the following criteria are met:

(A) Within the last 12 months, the Department or a Department-approved party has completed a sanitary survey or a Level 2 assessment.

(B) The system is free of sanitary defects and all significant deficiencies have been corrected, has a protected source water, and meets approved construction standards.

(C) The system's water source(s) is protected from the direct influence of surface water or any other source of contamination.

(D) The system has a clean compliance history for at least 12 consecutive months.

(d) For Non-community Groundwater Systems Supplying Less Than or Equal to (≤) 1,000 People – Additional Routine Sampling Requirements in the Month Following a Total Coliform-positive Sample Result

(i) If the supplier is collecting total coliform samples on a quarterly frequency and one or more of the samples collected is total coliform-positive (with or without a Level 1 treatment technique trigger), the supplier must collect at least three additional routine samples during the following month.

(A) The supplier may either collect the samples at regular time intervals throughout the month or collect all required additional routine samples on a single day if the samples are collected from different sites.

(ii) If any of the additional routine sample results are total coliform-positive, the supplier must collect repeat samples as specified in 11.16(5).

(iii) The supplier must use the results of additional routine samples to determine whether an *E. coli* MCL violation of 11.16(10) has occurred or if a treatment technique requirement is triggered under 11.16(9).

(iv) If all three additional routine samples are total coliform-negative, the supplier may return to collecting one total coliform sample on a quarterly sampling frequency. The supplier must begin collecting the quarterly sampling frequency in the calendar quarter following the month that the three additional routine samples were required.

(e) If any routine or repeat sample result is total coliform-positive, the supplier must have a laboratory analyze the total coliform-positive culture medium to determine if *E. coli* are present.

(i) If any routine sample under 11.16(4), repeat sample under 11.16(5), or special purpose sample result under 11.3(78) is *E. coli*-positive, the supplier must notify the Department no later than the end of the day that the supplier is notified of the sample result.

(A) If the supplier is notified of the sample result after the Department is closed, the supplier must contact the Department's after-hours phone line.

(f) If any routine sample collected under 11.16(4) is total coliform-positive, the supplier must comply with the repeat monitoring requirements in 11.16(5).

11.16(5) Repeat Sampling Requirements for Total Coliform

(a) For each routine sample result collected under 11.16(4) that is total coliform-positive, the supplier must collect a sample set of at least three repeat total coliform samples no later than 24 hours after being notified of the positive sample result.

(i) If the supplier has a logistical problem beyond their control that prevents the supplier from collecting the repeat samples within the 24-hour limit, the Department may extend the 24-hour limit on a case-by-case basis.

(A) If the Department grants the extension, the Department shall specify how much time the supplier has to collect the repeat samples.

(ii) The Department shall not waive the requirement to collect repeat samples.

(b) The supplier must collect repeat samples in accordance with the written sample siting plan required under 11.16(3).

(c) The supplier must collect all repeat samples on the same day.

(i) If the system has only one service connection, the Department may allow the supplier to collect a larger volume repeat sample(s) in one or more sample containers of any size, as long as the total volume collected is at least 300 ml.

(d) If a treatment technique is triggered based only on routine sample results, the supplier is required to collect only one repeat sample set for each routine total coliform-positive routine sample, collected under 11.16(4), and is not required to comply with the requirements specified in 11.16(5)(e).

(e) If one or more of the repeat sample results is total coliform-positive, the supplier must:

(i) Collect an additional repeat sample set as specified in 11.16(5)(a-d) for each site that had a total coliform-positive sample result.

(A) The additional repeat sample set(s) must be collected no later than 24 hours after being notified of the total coliform-positive sample result(s), unless the Department extends the 24-hour limit as specified in 11.16(5)(a)(i).

(ii) Continue to collect additional repeat sample sets as specified in 11.16(5)(e)(i) until either:

(A) Total coliforms are not detected in one complete repeat sample set; or

(B) A treatment technique is triggered as specified in 11.16(8) based on total coliform-positive repeat sample results and the supplier has notified the Department.

(iii) If a trigger under 11.16(8) is exceeded as a result of a total coliform-positive routine sample, the supplier is required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

(f) If the supplier collects a routine sample, which after analysis is found to be total coliform-positive, but before receiving that sample result the supplier collects another routine sample within five service connections of the original sample, the supplier may use the subsequent routine sample as a repeat sample instead of as a routine sample.

(g) Results of all routine and repeat samples collected under 11.16(4) and or 11.16(5) not invalidated by the Department under 11.16(7) must be used to determine if a coliform treatment technique is triggered under 11.16(8).

11.16(6) Additional Requirements for Seasonal Systems

(a) The supplier must complete Department-approved start-up procedures and certify that the start-up procedures were completed before supplying water to the public each season.

(i) No later than the 10th of the month following the month that the system began supplying water to the public, the supplier must submit the certification that start-up procedures were completed.

(b) The supplier must either submit start-up procedures for Department approval or use the pre-approved procedures in the Department's *Revised Total Coliform Rule Start-up Procedures for Seasonal Systems Handbook*.

(c) As part of the start-up procedures, the supplier must collect a total coliform sample in the distribution system before supplying water to the public.

(d) All seasonal systems are required to collect monthly total coliform samples, pursuant to 11.16(4), during the operating season according to Table 11.16-I.

11.16(7) Invalidation of Total Coliform Samples

(a) A total coliform-positive sample result invalidated under 11.16(7) does not count towards meeting the minimum reporting requirements of 11.16.

(b) The Department may invalidate a total coliform-positive sample result only if one or more of the following conditions are met:

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

(ii) Based on repeat sample results collected under 11.16(5), the Department determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem that is limited to the specific service connection from which the total coliform sample was collected. The Department shall not invalidate a total coliform-positive sample result on the basis of repeat sample results unless all repeat sample(s) collected at the same site as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected at a site other than the original site are total coliform-negative. The Department shall not invalidate a total coliform-positive sample result solely on the basis that all repeat sample results are total coliform-negative, or if the system has only one service connection.

(iii) The Department has substantial grounds to believe that a total coliform-positive sample result was due to a circumstance or condition that does not reflect water quality in the distribution system. If the Department makes this determination, the supplier must still collect the required number of repeat samples under 11.16(5) and use them to determine if a treatment technique is triggered as specified in 11.16(8). The Department must document the decision and supporting rationale for invalidating a total coliform-positive sample result in writing, have it approved and signed by a supervisor of the Department official who recommended the decision, and make this document available to the EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample result and what action the supplier has taken, or will take, to correct the problem. The Department shall not invalidate a total coliform-positive sample result solely on the basis that all repeat sample results are total coliform-negative.

(iv) The laboratory shall invalidate a total coliform sample result (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the Multiple-Tube Fermentation Technique), the sample produces a turbid culture in the absence of an acid reaction in the Presence-Absence (P-A) Coliform Test, or the sample exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., Membrane Filter Technique). If the laboratory invalidates a sample result because of such interferences, the supplier must collect a replacement total coliform sample from the same site as the invalidated sample no later than 24 hours after being notified of the invalidation, and have it analyzed for the presence of total coliforms. The supplier must continue to re-sample within 24 hours and have the samples analyzed for the presence of total coliforms until the supplier obtains a valid result. The Department may extend the 24-hour limit on a case-by-case basis.

(A) “CONFLUENT GROWTH” means, in the context of bacterial testing, a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

(B) "TOO NUMEROUS TO COUNT" means that the total number of bacterial colonies exceeds 200 on a 47-millimeter (mm) diameter membrane filter used for coliform detection.

11.16(8) Total Coliform Treatment Technique Triggers

(a) The treatment technique triggers for a Level 1 assessment are as follows:

(i) If the supplier collects greater than or equal to (≥) 40 samples per month, more than 5.0 percent of the samples collected for the month are total coliform-positive.

(ii) If the supplier collects less than (<) 40 samples per month, two or more samples collected for the monitoring period are total coliform-positive.

(iii) The supplier fails to collect all required repeat samples after any single total coliform-positive sample.

(b) The treatment technique triggers for a Level 2 assessment are as follows:

(i) An *E. coli* MCL violation occurs as specified in 11.16(11)(a).

(ii) A second treatment technique trigger for a Level 1 assessment, as specified in 11.16(8)(a), occurred within 12 consecutive months, except:

(A) If the Department has determined the likely reason(s) for the total coliform-positive sample(s) that caused the first Level 1 assessment to be triggered and the Department has established that the supplier has corrected the problem(s).

11.16(9) Treatment Technique Requirements: Level 1 and Level 2 Assessment

(a) Once all of the monitoring required by 11.16(4) and or 11.16(5) has been completed, the supplier must determine if any treatment technique has been triggered as specified in 11.16(8). If at any time a treatment technique trigger has been exceeded, the supplier must complete the assessments as required by 11.16(9).

(b) General Requirements for Assessments

(i) To identify the possible presence of sanitary defects and defects in distribution system coliform sampling practices, the supplier must ensure that a Level 1 or Level 2 assessment is conducted.

(ii) The supplier must ensure that the assessor evaluates at least all of the following elements:

(A) Inadequacies in sample sites.

(B) Inadequacies in sampling protocol.

(C) Inadequacies in sample processing.

(D) Atypical events that could affect distributed water quality or indicate that distributed water quality was impaired.

(E) Changes in distribution system maintenance and operation, including water storage, that could affect distributed water quality.

(F) Source and treatment considerations that affect distributed water quality.

(G) Existing water quality monitoring data.

(iii) The supplier or the Department may request a consultation with the other party at any time during the assessment or corrective action phase. The consultation may be used to determine appropriate actions to be taken or to discuss relevant information that may impact the supplier's ability to comply with the requirements specified in 11.16(9).

(iv) If required by the Department, the supplier must ensure that the assessment is conducted consistent with any Department-specified modifications to assessment elements based on the size and type of the system and the size, type, and characteristics of the distribution system.

(v) The supplier must correct sanitary defects found through either Level 1 or Level 2 assessments, pursuant to 11.16(9)(b)(ii). If the supplier has not completed corrective action for any sanitary defect before the submission of the assessment form, the supplier, in consultation with the Department, must complete the corrective action(s) on a Department-approved schedule. The supplier must notify the Department when each scheduled corrective action is completed.

(c) Level 1 Assessments

(i) If any treatment technique for a Level 1 assessment is triggered under 11.16(8)(a), the supplier must complete a Level 1 assessment, consistent with Department requirements, as soon as practical.

(ii) No later than 30 days after learning of a treatment technique trigger for a Level 1 assessment, the supplier must submit for review a completed Level 1 assessment form. In the completed form, the supplier must state whether sanitary defects were identified and if so, describe all of the following:

(A) Sanitary defects identified.

(B) The likely reason(s) for the treatment technique trigger.

(C) If sanitary defects are identified, corrective actions completed.

(D) If sanitary defects are identified, a proposed schedule for any corrective actions not already completed.

(E) The assessment form may also indicate that no sanitary defects were found.

(iii) If the Department reviews the Level 1 assessment form and determines that the assessment is not sufficient or the assessment form is not complete (including any proposed schedule for any corrective actions not already completed), the Department shall consult with the supplier. If the Department requires revisions after consultation, the supplier must submit a revised assessment form to the Department on an agreed-upon date no later than 30 days from the date of the consultation.

(iv) Upon completion and submission of the assessment form by the supplier, the Department shall determine if the supplier identified the likely reason(s) for the Level 1 trigger. If the supplier identified the likely reason(s) for the treatment technique trigger, the Department shall determine if the supplier corrected the problem or included a Department-approved schedule for correcting the problem.

(d) Level 2 Assessments

(i) If any treatment technique for a Level 2 assessment is triggered under 11.16(8)(b), the supplier must ensure that a Level 2 assessment is conducted as soon as practical. The supplier must ensure that the Level 2 assessment, consistent with Department requirements, is completed by the Department or Department-approved party.

(ii) The supplier must comply with any expedited actions or additional actions required by the Department in the case of an *E. coli* violation.

(iii) No later than 30 days after learning of a Level 2 treatment technique trigger exceedance, the supplier must submit for review a completed Level 2 assessment form. The supplier must state whether sanitary defects were identified and if so, describe all of the following:

(A) Sanitary defects identified.

(B) The likely reason(s) for the Level 2 treatment technique trigger.

(C) If sanitary defects are identified, corrective actions completed.

(D) If sanitary defects are identified, a proposed schedule for any corrective actions not already completed.

(E) The assessment form may also indicate that no sanitary defects were found.

(iv) If the Department reviews the Level 2 assessment form and determines that the assessment was not sufficient or the assessment form is not complete (including any proposed schedule for any corrective actions not already completed), the Department shall consult with the supplier. If the Department requires revisions after consultation, the supplier must submit a revised assessment form to the Department on an agreed-upon schedule no later than 30 days from the date of the consultation.

(v) Upon completion and submission of the assessment form by the supplier, the Department shall determine if the supplier identified the likely reason(s) for the Level 2 treatment technique trigger. If the supplier identified the likely reason(s) for the treatment technique trigger, the Department shall determine if the supplier corrected the problem or included a Department-approved schedule for correcting the problem.

11.16(10) Compliance Determination for the *E. coli* MCL

(a) To determine if an *E. coli* MCL violation has occurred, the supplier must include the results of all routine and repeat samples collected in the monitoring period under 11.16(4) and 11.16(5).

(b) The BATs for achieving compliance with the *E. coli* MCL are specified in 40 CFR 141.63(e-f).

11.16(11) Violations

(a) The following constitute *E. coli* MCL violations, pursuant to 11.45(1) and Table 11.45-I:

(i) A repeat sample is *E. coli*-positive following a total coliform-positive routine sample.

(ii) A repeat sample is total coliform-positive following an *E. coli*-positive routine sample.

(iii) The supplier fails to collect all required repeat samples following an *E. coli*-positive routine sample.

(iv) The supplier fails to analyze a total coliform-positive repeat sample for *E. coli*.

(v) If a repeat sample collected at the monitoring location for triggered source water monitoring is *E. coli-positive*. The supplier must also comply with 11.11(4)(d). If a supplier collects more than one repeat sample at the monitoring location for triggered source water monitoring, the supplier may reduce the number of additional source water samples required under 11.11(4) by the number of repeat samples collected at that location that were not *E. coli*-positive.

(vi) If a supplier collects more than one repeat sample at the triggered source water monitoring location under 11.11(4), and more than one repeat sample is *E. coli*-positive, the supplier has violated the *E. coli* MCL and must also comply with 11.11(6) .

(vii) If all of the repeat samples collected at the triggered source water monitoring location are *E. coli* negative and a repeat sample collected other than the one for triggered source water monitoring is *E. coli*-positive, the supplier has violated the *E. coli* MCL under 11.16(11)(a) and the supplier is not required to comply with 11.11(4)(d).

(b) The following constitute treatment technique violations:

(i) A treatment technique was triggered under 11.16(8) and the supplier failed to conduct the required assessment or corrective action(s) within the timeframe as specified in 11.16(9).

(ii) For seasonal systems, the supplier fails to complete Department-approved start-up procedures before supplying water to the public.

(c) The following constitute monitoring violations:

(i) Failure to collect every required routine or additional routine sample in the supplier's compliance period.

(ii) Failure to analyze for *E. coli* following a total coliform-positive routine sample.

(d) The following constitute reporting violations:

(i) Failure to submit monitoring results or a completed assessment form after a supplier conducts the required monitoring or assessment in a timely manner.

(ii) Failure to notify the Department following an *E. coli*-positive sample as required by 11.16(4)(e)(i) in a timely manner.

(iii) For seasonal systems, failure to submit certification of completion of Department-approved start-up procedures.

11.16(12) Reporting Requirements

(a) In the event of an *E. coli* MCL violation, the supplier must:

(i) Notify the Department no later than the end of the day that the supplier learns of the violation. If the supplier learns of the violation after the Department is closed, the supplier must contact the Department's 24 Hour Environmental Release/Incident report line (i.e., after-hours phone line).

(ii) Distribute Tier 1 public notice as specified in 11.33.

(b) In the event of a coliform treatment technique violation under 11.16(11)(b), the supplier must:

(i) Notify the Department no later than the end of the next business day after the supplier learns of the violation.

(ii) Distribute Tier 2 public notice as specified in 11.33.

(c) In the event of an *E. coli*-positive routine or repeat sample event, the supplier must notify the Department no later than the end of the day when the supplier is notified. If the supplier learns of the violation after the Department is closed, the Supplier must contact the Department's 24 Hour Environmental Release/Incident report line (i.e., after-hours phone line).

(d) A supplier required to conduct an assessment under 11.16(9) must submit the assessment report within 30 days. The supplier must notify the Department, in accordance with 11.16(9)(c)(iv) or 11.16(9)(d)(v), when each scheduled corrective action is completed for corrections not completed at the time of submission of the assessment form.

(e) In the event of a coliform monitoring violation, the supplier must:

(i) Notify the Department within 10 days after the system discovers the violation.

(ii) Conduct Tier 3 public notice as specified in 11.33.

(f) No later than the 10th of the month following the month that the seasonal system began supplying water to the public, the supplier must submit certification that start-up procedures were completed.

11.17 RESERVED

11.18 NITRATE AND NITRITE RULE

11.18(1) Applicability

For all public water systems, the supplier must comply with the requirements specified in this rule.

11.18(2) MCL Requirements for Nitrate and Nitrite

(a) The nitrate and nitrite MCLs are as follows:

TABLE 11.18-I NITRATE AND NITRITE CHEMICALS MCLs	
Chemical	MCL (mg/L)
Nitrate	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)
Total Nitrate and Nitrite	10 (as Nitrogen)

(b) The cited detection limits for nitrate and nitrite are specified in 40 CFR 141.23(a)(4)(i).

(c) The BATs for achieving compliance with the MCLs for nitrate and nitrite are specified in 40 CFR 141.62(c).

(d) Elevated MCL Requirements for Nitrate

(i) For non-community water systems, the Department may allow an elevated MCL of 20 mg/L for nitrate, if the supplier can demonstrate to the satisfaction of the Department that:

(A) Such water will not be available to children under 6 months of age; and

(B) It will not result in any adverse health effects.

(ii) If the Department allows an elevated MCL for nitrate, the supplier must:

(A) Continuously post public notice stating that nitrate levels are greater than (>) 10 mg/L and include the potential health effects of exposure.

(I) The supplier must distribute Tier 1 public notice as specified in 11.33.

(B) Notify local and State public health authorities annually of nitrate levels greater than (>) 10 mg/L.

11.18(3) Sampling Requirements for Nitrate and Nitrite

(a) General Sampling Requirements for Nitrate and Nitrite

(i) To determine compliance with the MCLs for nitrate and nitrite, the supplier must comply with the sampling requirements specified in this section, 11.18(3).

(ii) The supplier may apply to the Department to sample more frequently than required.

(iii) The Department may:

(A) Require the supplier to sample more frequently than the minimum requirements specified in 11.18(3)(b) or 11.18(3)(c).

(B) Require the supplier to collect a confirmation sample for any sample result.

(C) Invalidate sample results based on sampling or analytical errors.

(D) Specify when the supplier must sample during each monitoring period.

(iv) If the system draws water from more than one source and the sources are combined before distribution, the supplier must sample during periods of normal operating conditions.

(b) Sampling Requirements for Nitrate

(i) To determine compliance with the MCL for nitrate, the supplier must comply with the sampling requirements specified in this section, 11.18(3)(b).

(ii) For new systems or new sources, the supplier must begin sampling at a routine frequency when the new system or source begins supplying water to the public.

(iii) For routine sampling, the supplier must collect one sample at each entry point:

(A) For community and non-transient, non-community water systems:

(I) For surface water systems, quarterly.

(II) For groundwater systems, annually.

(B) For transient, non-community water systems, annually.

(iv) For community and non-transient, non-community water systems, if the supplier is sampling annually and any sample result is greater than or equal to (≥) 50 percent of the MCL, the supplier must increase the sampling frequency at that entry point to quarterly for at least one year.

(v) If the supplier is required to sample quarterly, the Department may allow the supplier to reduce the sampling frequency at that entry point to annually if the sample results from four consecutive quarters are:

(A) For groundwater systems, reliably and consistently below the MCL.

(B) For community and non-transient, non-community surface water systems, less than (<) 50 percent of the MCL.

(vi) If the Department allows the supplier to reduce the sampling frequency to annually, the supplier must sample during the quarter that previously had the highest sample result.

(vii) If any sample result is greater than (>) the MCL, the supplier must collect a confirmation sample at that entry point no later than 24 hours after being notified of the original sample result.

(A) If the supplier is unable to collect a confirmation sample within 24 hours, the supplier must:

(I) Distribute Tier 1 public notice as specified in 11.33 no later than 24 hours after being notified of the original sample result.

(II) Collect and analyze a confirmation sample no later than 14 days after being notified of the original sample result.

(viii) If the Department allows an elevated MCL for nitrate, the supplier must sample at a Department-specified frequency.

(A) If any sample result is greater than (>) the elevated MCL, the supplier must:

(I) Notify the Department no later than seven days after being notified of the original sample result.

(II) Collect three confirmation samples at the same entry point no later than one month after being notified of the original sample result.

(c) Sampling Requirements for Nitrite

(i) To determine compliance with the MCL for nitrite, the supplier must comply with the sampling requirements specified in this section, 11.18(3)(c).

(ii) For new systems or new sources, the supplier must collect an initial sample at each entry point within the first year of operation.

(iii) After collecting the initial sample, if the sample result is less than (<) 50 percent of the MCL, the supplier must sample at a routine frequency. For routine sampling, the supplier must sample at that entry point once during each nine-year compliance cycle.

(iv) If any sample result is greater than or equal to (≥) 50 percent of the MCL, the supplier must increase the sampling frequency at that entry point to quarterly for at least one year.

(A) If the sample results are reliably and consistently below the MCL, the Department may allow the supplier to reduce the sampling frequency at that entry point to annually.

(I) If the Department allows the supplier to reduce the sampling frequency to annually, the supplier must sample during the quarter that previously had the highest sample result.

(v) If any sample result is greater than (>) the MCL, the supplier must collect a confirmation sample at that entry point no later than 24 hours after being notified of the original sample result.

(A) If the supplier is unable to collect a confirmation sample within 24 hours, the supplier must:

(I) Distribute Tier 1 public notice as specified in 11.33 no later than 24 hours after being notified of the original sample result.

(II) Collect and analyze a confirmation sample no later than 14 days after being notified of the original sample result.

(d) Sampling Requirements for Consecutive Systems with Their Own Additional Sources

(i) For consecutive systems, the Department may change the nitrate and nitrite sampling requirements if the system meets all of the following criteria:

(A) The purchased water enters the distribution system separate from any additional sources owned by the consecutive system.

(B) The interconnection of the systems justifies the modification of sampling requirements.

(ii) The supplier must comply with the Department-specified schedule.

11.18(4) Compliance Determination for Nitrate and Nitrite

Compliance with the MCL is based on the individual sample result, unless a confirmation sample is required.

(a) If a confirmation sample is required, compliance will be based on the average of the original sample result and the confirmation sample result.

(b) If a sample result is less than (<) the cited detection limit, the sample result will be given a value of zero to calculate the average.

(c) If the supplier fails to collect the required number of samples, compliance will be based on the available sample results.

(d) If the Department allows an elevated MCL for nitrate and confirmation samples are required, compliance will be based on the average of the original sample result and the three confirmation sample results.

(i) The Department may determine compliance or initiate an enforcement action based on analytical results and other information gathered by Department-authorized representatives and agencies.

11.18(5) MCL Violation and Response for Nitrate and Nitrite

(a) If the average of any sample and its confirmation sample(s) is greater than (>) the MCL for nitrate and/or nitrite, an MCL violation occurs.

(b) In the event of a nitrate and/or nitrite MCL violation, the supplier must:

(i) Notify the Department and initiate consultation no later than 24 hours after the violation occurs.

(ii) Distribute Tier 1 public notice as specified in 11.33.

11.19 INORGANIC CHEMICALS RULE

11.19(1) Applicability and Definitions

(a) For all community and non-transient, non-community water systems, the supplier must comply with the requirements specified in this rule.

(i) For non-transient, non-community water systems, the supplier is required to comply with the sampling requirements for fluoride but is not required to comply with the fluoride MCL unless the Department determines that complying with the MCL is necessary to protect public health.

(ii) For transient, non-community water systems, the supplier may be required to comply with the fluoride MCL if the Department determines that complying with the MCL is necessary to protect public health.

(b) For the purpose of this rule, “INORGANIC CHEMICALS” means all the chemicals listed in Table 11.19-I.

11.19(2) MCL Requirements for Inorganic Chemicals

(a) The inorganic chemical MCLs are as follows:

TABLE 11.19-I INORGANIC CHEMICAL MCLs

Chemical	MCL (mg/L)
Antimony	0.006
Arsenic	0.010
Asbestos	7 Million Fibers/liter (Longer than 10 µm)
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide (as free Cyanide)	0.2
Fluoride	4.0[1]
Mercury	0.002
Nickel	N/A[2]
Selenium	0.05
Thallium	0.002

1 This is the primary MCL for fluoride. Fluoride also has a secondary MCL of 2.0 mg/L.

2 Nickel has no MCL. The supplier must sample for nickel as specified in 11.19(3)(b).

(b) The cited detection limits for inorganic chemical analysis are specified in 40 CFR 141.23(a)(4)(i).

(c) The BATs for achieving compliance with the MCLs for inorganic chemicals, with the exception of fluoride, are specified in 40 CFR 141.62(c).

(d) For systems supplying less than or equal to (≤) 10,000 people, the SSCTs for achieving compliance with the MCL for arsenic are specified in 40 CFR 141.62(d).

11.19(3) Sampling Requirements for Inorganic Chemicals

(a) General Sampling Requirements for Inorganic Chemicals

(i) To determine compliance with the MCLs for inorganic chemicals, the supplier must comply with the sampling requirements specified in this section, 11.19(3).

(ii) The supplier may apply to the Department to sample more frequently than required.

(iii) The Department may:

(A) Require the supplier to sample more frequently than the minimum requirements specified in this section, 11.19(3).

(B) Require the supplier to collect a confirmation sample for any sample result.

(C) Invalidate sample results based on sampling or analytical errors.

(D) Specify when the supplier must sample during each monitoring period.

(iv) If the system draws water from more than one source and the sources are combined before distribution, the supplier must sample during periods of normal operating conditions.

(b) Sampling Requirements for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, Nickel, Selenium and Thallium

(i) To determine compliance with the MCLs for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium and thallium, the supplier must comply with the sampling requirements specified in this section, 11.19(3)(b).

(A) For nickel, the supplier must comply with the sampling requirements specified in this section, 11.19(3)(b), and the requirements specified in 11.19(3)(a).

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the Department shall specify the initial sampling frequency at each entry point. The supplier must demonstrate compliance with the MCLs no later than one year after beginning supplying water to the public or one year after being reclassified.

(iii) After completing initial sampling, if the Department requires the supplier to sample at a routine frequency, the supplier must collect one sample at each entry point:

(A) For surface water systems, annually.

(B) For groundwater systems, once during each three-year compliance period.

(iv) The Department may allow the supplier to reduce the sampling frequency based on all of the following information:

(A) All previous sample results.

(B) The degree of variation in previous sample results.

(C) Other factors which may affect chemical concentrations (e.g., changes in groundwater pumping rates, the system's configuration, the system's operating procedures, or stream flows or characteristics).

(v) If any sample result is greater than (>) the MCL, the supplier must collect a confirmation sample at that entry point as soon as possible, but no later than 14 days after the original sample was collected.

(vi) If the average of any sample result and its confirmation sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly at that entry point.

(A) The Department may allow the supplier to return to a routine sampling frequency at that entry point if the Department determines that the sample results are reliably and consistently below the MCL. To make that determination, the supplier must collect:

(I) For surface water systems, at least four quarters of samples at the entry point where the exceedance occurred.

(II) For groundwater systems, at least two quarters of samples at the entry point where the exceedance occurred.

(c) Sampling Waiver Requirements for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, Nickel, Selenium and Thallium

(i) The supplier may apply to the Department or the Department may initiate a sampling waiver from antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium.

(ii) If the Department grants a waiver, the supplier is not required to sample at the frequencies specified in 11.19(3)(b).

(iii) The Department may grant a waiver to the supplier if all previous sample results are reliably and consistently below the MCL. To make that determination, the supplier must have collected:

(A) For surface water systems, annual samples for at least three years.

(B) For groundwater systems, samples for at least three consecutive three-year compliance periods.

(C) For a new source, samples for at least three monitoring periods.

(iv) For a cyanide waiver, the supplier must only demonstrate that the system is not vulnerable to cyanide based on the lack of any industrial source of cyanide.

(v) If the supplier is granted a waiver, the waiver will be effective for no more than one nine-year compliance cycle. The supplier must collect at least one sample while the waiver is effective.

(vi) When the supplier submits new sample results, or when other relevant data are available, the Department may revise the required sampling frequency.

(d) Sampling Requirements for Asbestos

(i) To determine compliance with the MCL for asbestos, the supplier must comply with the sampling requirements specified in this section, 11.19(3)(d).

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the supplier must begin sampling at a routine frequency when the new system or source begins supplying water to the public or when the system is reclassified.

(iii) For routine sampling, the supplier must collect one sample during the first three-year compliance period of each nine-year compliance cycle at the following locations:

(A) For systems that are vulnerable to asbestos from corrosion of asbestos-cement pipe, at taps that are supplied by asbestos-cement pipe under conditions where asbestos contamination is most likely to occur.

(B) For systems that are vulnerable to asbestos from source water contamination, at each entry point.

(C) For systems that are vulnerable to asbestos from both corrosion of asbestos-cement pipe and source water contamination, at taps that are supplied by asbestos-cement pipe under conditions where asbestos contamination is most likely to occur.

(iv) If any sample result is greater than (>) the MCL, the supplier must collect a confirmation sample at that sampling location no later than 14 days after the original sample was collected.

(v) If the average of any sample result and its confirmation sample result is greater than (>) the MCL, the supplier must increase the sampling frequency at that sampling location to quarterly.

(A) The Department may allow the supplier to return to routine sampling if the Department determines the sample results at that sampling location are reliably and consistently below the MCL. To make that determination, the supplier must collect:

(I) For surface water systems, at least four quarters of samples at the sampling location where the exceedance occurred.

(II) For groundwater systems, at least two quarters of samples at the sampling location where the exceedance occurred.

(e) Sampling Waiver Requirements for Asbestos

(i) The supplier may apply to the Department for an asbestos waiver or the Department may initiate an asbestos waiver.

(ii) The Department may grant a waiver to the supplier if the system is not vulnerable to potential asbestos contamination based on all of the following information:

(A) Potential asbestos contamination of the source water.

(B) The use of asbestos-cement pipe in the distribution system and the corrosivity of treated water.

(iii) If the Department grants an asbestos waiver, the supplier is not required to sample for asbestos as specified in 11.19(3)(d).

(A) The waiver is effective for one nine-year compliance cycle.

(f) Sampling Requirements for Consecutive Systems with Their Own Sources

(i) For consecutive systems, the Department may modify the inorganic chemical sampling requirements if the system meets all of the following criteria:

(A) The purchased water enters the distribution system separate from any source owned by the consecutive system.

(B) The interconnection of the systems justifies the modification of sampling requirements.

(ii) The supplier must comply with the Department-specified schedule.

11.19(4) Compliance Determination for Inorganic Chemicals

(a) If the supplier samples more frequently than annually, MCL compliance is based on the LRAA.

(i) If a confirmation sample is required, the original sample result will be replaced with the average of the original sample result and the confirmation sample result when calculating the LRAA.

(A) If the supplier fails to collect the confirmation sample, the original sample result will be used when calculating the LRAA.

(ii) If a sample result is less than (<) the cited detection limit, the sample result will be given a value of zero when calculating the LRAA.

(b) If the supplier samples annually or less frequently, MCL compliance is based on each individual sample result, unless a confirmation sample is required.

(i) If a confirmation sample is required, compliance is based on the average of the sample result and its confirmation sample result.

(A) If the supplier fails to collect the confirmation sample, the original sample result will be used to determine compliance.

(ii) If the average of any sample result and its confirmation sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly as specified in 11.19(3)(b)(vi). This average will count as the first quarter sample result and compliance with the MCL will be based on the LRAA.

11.19(5) MCL Violations for Inorganic Chemicals

The following constitute inorganic chemical MCL violations:

(a) The LRAA at any entry point is greater than (>) the MCL for any inorganic chemical.

(b) The LRAA, calculated before four consecutive quarters of samples have been collected at any entry point or sampling location, is greater than (>) the MCL for any inorganic chemical regardless of the subsequent sample results.

11.19(6) Response to MCL Violations for Inorganic Chemicals

In the event of an inorganic chemical MCL violation, the supplier must:

(a) Notify the Department no later than 48 hours after the violation occurs.

(b) Distribute Tier 2 public notice as specified in 11.33.

11.19(7) Response to Exceeding the Secondary MCL for Fluoride

(a) For community water systems, if a fluoride sample result is greater than (>) the SMCL of 2.0 mg/L and less than (<) the MCL (4.0 mg/L), the supplier must distribute public notice as specified in this section, 11.19(7).

(b) The supplier must distribute the public notice no later than 12 months after the day the supplier learns of the exceedance.

(i) On a case-by-case basis, the Department may require the supplier to distribute the public notice sooner than 12 months.

(c) The supplier must submit a copy of the notice to the Department and all new billing units and new customers at the time service begins.

(d) If the public notice is posted, the notice must remain in place for as long as the SMCL is exceeded or seven days, whichever is longer.

(e) The supplier must redistribute the notice at least annually for as long as the SMCL is exceeded.

(i) On a case-by-case basis, the Department may require the supplier to redistribute the notice more frequently than annually.

(f) The public notice, including repeat notices, must comply with the requirements for Tier 3 public notice as specified in 11.33.

(g) The supplier must include the following language in the public notice exactly as written and provide the specific information for the text in brackets:

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

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

Drinking water containing more than 4 mg/L of fluoride (the Colorado Department of Public Health and Environment's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4 mg/L of fluoride, but we're required to notify you when we discover that the fluoride levels in your drinking water exceed 2 mg/L because of this cosmetic dental problem.

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

11.20 SODIUM RULE

11.20(1) Applicability

For all community water systems, the supplier must comply with the requirements specified in this rule.

11.20(2) Requirements for Sodium

(a) For new sources, new systems, or reclassified systems that now meet the applicability of this rule, the supplier must begin collecting routine samples when the new system or source begins serving water to the public or when the system is reclassified.

(b) For routine sampling, the supplier must collect one sample at each entry point:

(i) For surface water systems, annually.

(ii) For groundwater systems, every three years.

(c) If the system has multiple wells drawing raw water from a single aquifer, the Department may reduce the number of sodium samples required if a single entry point is determined to be representative of multiple entry points.

(d) In addition to the general reporting requirements specified in 11.35, the supplier must submit a notice of the sodium sample results to appropriate local public health officials, by direct mail, each year.

(i) The supplier must submit a copy of the notice to the Department no later than ten days after issuing the notice to the appropriate local public health officials.

11.21 ORGANIC CHEMICALS RULE

11.21(1) Applicability and Definitions

(a) For all community and non-transient, non-community water systems, the supplier must comply with the requirements specified in this rule.

(b) “SYNTHETIC ORGANIC CHEMICALS” or “SOCs” mean all of the chemicals specified in Table 11.21-II.

(c) “VOLATILE ORGANIC CHEMICALS” or “VOCs” mean all of the chemicals specified in Table 11.21-I.

11.21(2) MCL Requirements for Organic Chemicals

(a) MCL Requirements for VOCs

(i) The VOC MCLs and cited detection limits are as follows:

TABLE 11.21-I VOC MCLs AND DETECTION LIMITS			
CAS No.	Chemical	MCL (mg/L)	Cited detection limit (mg/L)
75-01-4	Vinyl chloride	0.002	0.0005
71-43-2	Benzene	0.005	0.0005
56-23-5	Carbon tetrachloride	0.005	0.0005
107-06-2	1,2-Dichloroethane	0.005	0.0005
79-01-6	Trichloroethylene	0.005	0.0005
106-46-7	Para-Dichlorobenzene	0.075	0.0005
75-35-4	1,1-Dichloroethylene	0.007	0.0005
71-55-6	1,1,1-Trichloroethane	0.2	0.0005
156-59-2	cis-1,2 Dichloroethylene	0.07	0.0005
78-87-5	1,2-Dichloropropane	0.005	0.0005
100-41-4	Ethylbenzene	0.7	0.0005
108-90-7	Monochlorobenzene	0.1	0.0005
95-50-1	o-Dichlorobenzene	0.6	0.0005
100-42-5	Styrene	0.1	0.0005
127-18-4	Tetrachloroethylene	0.005	0.0005
108-88-3	Toluene	1	0.0005
156-60-5	Trans-1,2 Dichloroethylene	0.1	0.0005
1330-20-7	Xylenes (total)	10	0.0005
75-09-2	Dichloromethane (methylene chloride)	0.005	0.0005
120-82-1	1,2,4-Trichlorobenzene	0.07	0.0005
79-00-5	1,1,2-Trichloroethane	0.005	0.0005

(ii) The BATs for achieving compliance with the MCLs for VOCs are specified in 40 CFR 141.61(b).

(b) MCL Requirements for SOCs

(i) The SOC MCLs and cited detection limits are as follows:

TABLE 11.21-II SOC MCLs AND DETECTION LIMITS			
CAS No.	Chemical	MCL (mg/L)	Cited detection limit (mg/L)
15972-60-8	Alachlor	0.002	0.0002
116-06-3	Aldicarb[1]	0.003	0.0005
1646-87-3	Aldicarb sulfoxide[1]	0.004	0.0005
1646-88-4	Aldicarb sulfone[1]	0.002	0.0008
1912-24-9	Atrazine	0.003	0.0001
1563-66-2	Carbofuran	0.04	0.0009
57-74-9	Chlordane	0.002	0.0002
96-12-8	Dibromochloropropane	0.0002	0.00002
94-75-7	2,4-D	0.07	0.0001
106-93-4	Ethylene dibromide	0.00005	0.00001
76-44-8	Heptachlor	0.0004	0.00004
1024-57-3	Heptachlor epoxide	0.0002	0.00002

TABLE 11.21-II SOC MCLs AND DETECTION LIMITS			
CAS No.	Chemical	MCL (mg/L)	Cited detection limit (mg/L)
58-89-9	Lindane	0.0002	0.00002
72-43-5	Methoxychlor	0.04	0.0001
1336-36-3	Polychlorinated biphenyls	0.0005	0.0001
87-86-5	Pentachlorophenol	0.001	0.00004
8001-35-2	Toxaphene	0.003	0.001
93-72-1	2,4,5-TP (Silvex)	0.05	0.0002
50-32-8	Benzopyrene	0.0002	0.00002
75-99-0	Dalapon	0.2	0.001
103-23-1	Di(2-ethylhexyl)adipate	0.4	0.0006
117-81-7	Di(2-ethylhexyl)phthalate	0.006	0.0006
88-85-7	Dinoseb	0.007	0.0002
85-00-7	Diquat	0.02	0.0004
145-73-3	Endothall	0.1	0.009
72-20-8	Endrin	0.002	0.00001
1071-53-6	Glyphosate	0.7	0.006
118-74-1	Hexachlorobenzene	0.001	0.0001
77-47-4	Hexachlorocyclopentadiene	0.05	0.0001
23135-22-0	Oxamyl (Vydate)	0.2	0.002
1918-02-1	Picloram	0.5	0.0001
122-34-9	Simazine	0.004	0.00007
1746-01-6	2,3,7,8-TCDD (Dioxin)	3 x 10-8	0.000000005

1 Aldicarb, aldicarb sulfoxide, and aldicarb sulfone are currently under “administrative stay” as a result of litigation. They are therefore treated as unregulated contaminants. The supplier is not required to sample for them or comply with their MCLs.

(ii) The BATs for achieving compliance with the MCLs for SOCs are specified in 40 CFR 141.61(b).

11.21(3) Sampling Requirements for Organic Chemicals

(a) General Sampling Requirements for Organic Chemicals

(i) To determine compliance with the MCLs for organic chemicals, the supplier must comply with the sampling specified in this section, 11.21(3).

(ii) The Department may:

(A) Require the supplier to sample more frequently than the minimum requirements specified in this section, 11.21(3).

(B) Require the supplier to collect a confirmation sample for any sample result.

(C) Invalidate sample results based on sampling or analytical errors.

(D) Specify when the supplier must sample during each monitoring period.

(iii) If the system draws water from more than one source and the sources are combined before distribution, the supplier must sample during periods of normal operating conditions.

(b) Sampling Requirements for VOCs

(i) To determine compliance with the MCLs for VOCs, the supplier must comply with the sampling requirements specified in this section, 11.21(3)(b).

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the supplier must sample for an initial four consecutive quarters at each entry point and demonstrate compliance with the MCLs no later than one year after beginning supplying water to the public or one year after being reclassified.

(A) For surface water systems, the supplier must sample for vinyl chloride as specified by the Department.

(B) For groundwater systems, the supplier must collect samples for vinyl chloride only as specified in 11.21(3)(b)(vi).

(iii) After completing initial sampling, if all sample results were less than (<) the cited detection limit at an entry point, the supplier must sample at a routine frequency at that entry point. For routine sampling, the supplier must collect one sample annually at that entry point.

(iv) For groundwater systems, if the supplier has collected at least three years of annual samples at an entry point and all sample results were less than or equal to (≤) the cited detection limit, the Department may reduce the required sampling frequency at that entry point to once during each three-year compliance period.

(v) If any sample result is greater than (>) the cited detection limit, but less than or equal to (≤) the MCL, the supplier must increase the sampling frequency to quarterly at each entry point where the detection occurred.

(A) The Department may allow the supplier to return to a routine sampling frequency if the Department determines that the sample results at that entry point are reliably and consistently below the MCL. To make that determination, the supplier must collect:

(I) For surface water systems, at least four quarters of samples at the entry point where the detection occurred.

(II) For groundwater systems, at least two quarters of samples at the entry point where the detection occurred.

(vi) For groundwater systems, if a sample result is greater than (>) the cited detection limit for one or more of the following chemicals, the supplier must sample quarterly for vinyl chloride at each entry point where the detection occurred:

(A) Trichloroethylene.

(B) Tetrachloroethylene.

(C) 1,2-dichloroethane.

(D) 1,1,1-trichloroethane.

(E) Cis-1,2-dichloroethylene.

(F) Trans-1,2-dichloroethylene.

(G) 1,1-dichloroethylene.

(vii) If the first sample result for vinyl chloride is less than or equal to (≤) the cited detection limit, the Department may reduce the quarterly sampling frequency at that entry point to one sample during each three-year compliance period.

(viii) If any sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly.

(A) The Department may allow the supplier to return to a routine sampling frequency if all of the following criteria are met:

(I) The supplier has collected four consecutive quarters of samples at that entry point after the exceedance that demonstrate that the system is in compliance.

(II) The Department determines that the sample results at that entry point are reliably and consistently below the MCL.

(ix) When returning to routine sampling, the supplier must collect samples during the quarter that previously resulted in the highest sample result.

(c) Sampling Waiver Requirements for VOCs

(i) The supplier may apply to the Department for a VOC waiver if:

(A) After completing initial sampling, all sample results are less than (<) the cited detection limit for VOCs; or

(B) After three consecutive years of annual sampling following detection of a VOC, all sample results are less than (<) the cited detection limit.

(ii) If the Department grants a VOC waiver, the supplier is not required to sample at the frequencies specified in 11.21(3)(b).

(iii) The Department may grant a VOC waiver to the supplier if the supplier demonstrates that within the watershed or zone of influence no VOCs were used.

(iv) If VOCs have been used or VOC use is unknown, the Department shall consider all of the following factors to determine whether to grant a waiver:

(A) Previous sample results.

(B) How well the source is protected against contamination.

(I) For groundwater sources, the Department shall consider factors including depth of the well, the type of soil, and wellhead protection.

(II) For surface water sources, the Department shall consider watershed protection.

(C) The proximity of the system to a potential point or non-point source of contamination.

(I) Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

(D) The environmental persistence and transport of VOCs.

(E) The population supplied by the system and the proximity of a smaller system to a larger system.

(v) For groundwater systems, a VOC waiver is effective for six years.

(A) The supplier must update the vulnerability assessment during the effective period of the waiver.

(I) The Department shall reconfirm that the system is non-vulnerable based on the vulnerability assessment.

(a) If the Department does not reconfirm that the system is non-vulnerable no later than three years after the initial determination, the waiver is withdrawn.

(B) The supplier must collect one sample at each entry point while the waiver is effective.

(vi) For surface water systems, the Department shall specify how long a VOC waiver is effective.

(A) The Department shall determine if the system is non-vulnerable based on a vulnerability assessment completed during each compliance period.

(B) The supplier must collect one sample at each entry point at the Department-specified frequency while the waiver is effective.

(vii) For small groundwater systems, the Department may grant a waiver from the initial sampling requirements for 1,2,4-trichlorobenzene specified in 11.21(3)(b)(ii).

(d) Sampling Requirements for SOCs

(i) To determine compliance with the MCLs for SOCs, the supplier must comply with the sampling specified in this section, 11.21(3)(d).

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the supplier must collect an initial four consecutive quarters of samples at each entry point and demonstrate compliance with the MCL no later than one year after beginning supplying water to the public or one year after being reclassified.

(iii) After completing initial sampling, if all sample results for an SOC were less than (<) the cited detection limit at an entry point, the supplier must sample at a routine sampling frequency at that entry point. For routine sampling, the supplier must:

(A) For systems supplying greater than (>) 3,300 people, collect one sample in at least two different quarters in one calendar year during each three-year compliance period at that entry point.

(B) For systems supplying less than or equal to (≤) 3,300 people, collect at least one sample during each three-year compliance period at that entry point.

(iv) If any sample result is greater than or equal to (≥) the cited detection limit for an SOC, but less than or equal to the (≤) MCL, the supplier must increase the sampling frequency to quarterly for that SOC at each entry point where the detection occurred.

(A) If a sample result is greater than or equal to (≥) the cited detection limit for one or more of the following the supplier must increase the sampling frequency to quarterly for all of the following at that entry point:

(I) Aldicarb.

(II) Aldicarb sulfone.

(III) Aldicarb sulfoxide.

(B) If a sample result is greater than or equal to (≥) the cited detection limit for one or more of the following the supplier must increase the sampling frequency to quarterly for all of the following at that entry point:

(I) Heptachlor.

(II) Heptachlor epoxide.

(C) The Department may allow the supplier to reduce the sampling frequency to annually if the Department determines that the sample results at that entry point are reliably and consistently below the MCL. To make that determination, the supplier must collect:

(I) For surface water systems, at least four quarters of samples at the entry point where the detection occurred.

(II) For groundwater systems, at least two quarters of samples at the entry point where the detection occurred.

(v) If any sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly.

(A) The Department may allow the supplier to reduce the sampling frequency to annually if all of the following criteria are met:

(I) The supplier has collected four consecutive quarters of samples at that entry point after the exceedance that demonstrate that the system is in compliance.

(II) The Department determines that the sample results at that entry point are reliably and consistently below the MCL.

(vi) When reducing to annual sampling, the supplier must sample during the quarter that previously resulted in the highest sample result.

(e) Sampling Waiver Requirements for SOCs

(i) The supplier may apply to the Department for a waiver from any or all of the SOCs.

(A) If an SOC is detected, the supplier must sample annually for three consecutive years and if all sample results are less than (<) the cited detection limit, the supplier may apply to the Department for a waiver.

(ii) If the Department grants the waiver, the supplier is not required to sample at the frequencies specified in 11.21(3)(d) for that SOC.

(iii) The Department may grant an SOC waiver to the supplier if the supplier demonstrates that within the watershed or zone of influence, that SOC was not used (including transport, storage, or disposal).

(iv) If an SOC has been used or the use is unknown, the Department shall consider all of the following factors in determining whether to grant a waiver:

(A) Previous sample results.

(B) How well the source is protected against contamination, factors may include the depth of the well, the type of soil, and the integrity of the well casing.

(C) The proximity of the system to a potential point or non-point source of contamination.

(I) Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.

(II) Non-point sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.

(D) The environmental persistence and transport of pesticides or PCBs.

(E) Elevated nitrate levels at the source(s).

(F) Use of PCBs in equipment used in the production, storage, or distribution of water.

(v) The supplier must reapply for an SOC waiver each three-year compliance period.

11.21(4) Compliance Determination for Organic Chemicals

(a) If the supplier samples more frequently than annually, MCL compliance is based on the LRAA.

(i) If a confirmation sample is required, the original sample result will be replaced with the average of the original sample result and the confirmation sample result when calculating the LRAA.

(A) If the supplier fails to collect the confirmation sample, the original sample result will be used when calculating the LRAA.

(ii) If a sample result is less than (<) the cited detection limit, the sample result will be given a value of zero when calculating the LRAA.

(b) If the supplier samples annually or less frequently, MCL compliance is based on each individual sample result, unless a confirmation sample is required.

(i) If a confirmation sample is required, compliance will be based on by the average of the sample result and its confirmation sample result.

(A) If the supplier fails to collect the confirmation sample, the original sample result will be used to determine compliance.

(ii) If the sample result or average of any sample result and its confirmation sample result, if a confirmation sample is required, is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly as specified in 11.21(3)(b)(viii) and/or 11.21(3)(d)(v). This average, or sample result, will count as the first quarter result and compliance with the MCL will be based on an LRAA.

(c) The Department may determine compliance or initiate enforcement action based on sample results and other information gathered by Department-authorized representatives and agencies.

11.21(5) Acrylamide and Epichlorohydrin Certification

If acrylamide and epichlorohydrin are used in the drinking water system, the supplier must annually certify, in writing, to the Department, using a Department-approved third party or manufacturer's certification, that the combination of dose and monomer level is less than or equal to (≤) the following levels:

(a) Acrylamide = 0.05% dosed at 1 ppm (or equivalent).

(b) Epichlorohydrin = 0.01% dosed at 20 ppm (or equivalent).

11.21(6) Violations for Organic Chemicals

(a) The following constitute organic chemical MCL violations:

(i) The LRAA at any entry point is greater than (>) the MCL for any organic chemical.

(ii) The LRAA, calculated before four consecutive quarters of samples have been collected at any entry point, is greater than (>) the MCL for any organic chemical regardless of the subsequent sample results.

(b) Failure to comply with the acrylamide and epichlorohydrin certification requirements as specified in 11.21(5) constitutes a treatment technique violation.

11.21(7) Response to Violations for Organic Chemicals

In the event of an organic chemical MCL violation or an acrylamide and epichlorohydrin treatment technique violation, the supplier must:

(a) Notify the Department no later than 48 hours after the violation occurs.

(b) Distribute Tier 2 public notice as specified in 11.33.

11.22 RADIONUCLIDES RULE

11.22(1) Applicability and Definitions

(a) For all community water systems, the supplier must comply with the requirements specified in this rule.

(i) The supplier is not required to comply with the beta particle and photon radioactivity requirements, unless the Department determines the system is vulnerable to beta particle and photon radioactivity contamination or the system is using sources contaminated by effluents from nuclear facilities.

(b) "BETA PARTICLE AND PHOTON RADIOACTIVITY" means the radiation from a group of 179 man-made radionuclides, including tritium, strontium-90, and iodine-131, that emit beta and photon radiation. These man-made beta particle and photon emitters are listed in the *Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure*, NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

(c) "GROSS ALPHA PARTICLE ACTIVITY" means the radiation from all radionuclides emitting alpha radiation, including radium-226, excluding radon and uranium.

(d) "GROSS BETA PARTICLE ACTIVITY" means the radiation from all radionuclides that emit beta radiation. This measurement is used as part of the calculation to determine the beta particle and photon radioactivity.

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

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

11.22(2) MCL Requirements for Radionuclides

(a) The radionuclide MCLs are as follows:

TABLE 11.22-I RADIONUCLIDE MCLs	
Contaminant	MCL
Gross alpha particle activity (including radium-226, excluding radon1 and uranium)	15 pCi/L
Combined radium-226 and radium-2282	5 pCi/L
Uranium3	30 µg/L
Beta particle and photon radioactivity4	4 mrem/yr

1 Radon is not currently regulated in drinking water.

2 Radium-228 is an individual alpha particle activity emitter, however it is not included in the gross alpha particle activity and is measured separately. Radium-228 sample results are combined with radium-226 sample results for the purposes of determining compliance.

3 Uranium is an individual alpha particle activity emitter, however it is not included in the gross alpha particle activity and is measured separately. If uranium is determined by mass, a 0.67 pCi/µg of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 and U-238 that is characteristic of naturally occurring uranium.

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

(b) The cited detection limits for radionuclides are specified in 40 CFR 141.25(c).

(c) The BATs for achieving compliance with the MCLs for radionuclides are specified in 40 CFR 141.66(g).

(d) The SSCTs for systems supplying less than or equal to (≤) 10,000 people for achieving compliance with the MCL for radionuclides are specified in 40 CFR 141.66(h).

11.22(3) Sampling Requirements for Radionuclides

(a) General Radionuclide Sampling Requirements for Radionuclides

(i) To determine compliance with the radionuclide MCLs, the supplier must comply with the sampling requirements specified in this section, 11.22(3).

(ii) The supplier must sample at the time specified by the Department during each monitoring period.

(iii) The Department may:

(A) Require the supplier to sample more frequently than the minimum requirements specified in this section, 11.22(3).

(B) Require the supplier to collect a confirmation sample for any sample result.

(C) Invalidate sample results based on sampling or analytic errors.

(b) Sampling Requirements for Gross Alpha Particle Activity, Combined Radium-226 and Radium-228, and Uranium

(i) To determine compliance with the MCLs for gross alpha particle activity, combined radium-226 and radium-228, and uranium, the supplier must comply with the sampling requirements specified in this section, 11.22(3)(b).

(ii) For new systems, new sources, or reclassified systems that now meet the applicability of this rule, the supplier must collect four consecutive quarterly samples at each entry point no later than one year after beginning supplying water to the public or one year after being reclassified.

(A) If the sample results from the first two quarters are less than (<) the detection limit at an entry point, the Department may waive the final two quarters of initial sampling at that entry point and initial sampling will be considered complete at that entry point.

(iii) After completing initial sampling, if the LRAA of the initial sample results is greater than (>) the MCL, the supplier must continue to sample quarterly at that entry point.

(A) The supplier must continue to sample quarterly until the sample results from four consecutive quarters are less than or equal to (≤) the MCL, unless the supplier enters into another schedule as part of a formal compliance agreement with the Department.

(iv) If the LRAA is less than or equal to (≤) the MCL after completing initial sampling, the Department may allow the supplier to reduce the sampling frequency. There is no routine sampling frequency for gross alpha particle activity, combined radium-226 and radium-228, and uranium. Sampling frequencies will be based on the LRAA of the initial sample results at each entry point. If the LRAA is:

(A) Less than (<) the detection limit, the supplier must collect at least one sample for that radionuclide every nine years at that entry point.

(B) Greater than or equal to (≥) the detection limit and less than or equal to (≤) one-half the MCL, the supplier must collect at least one sample for that radionuclide every six years at that entry point.

(C) Greater than (>) one-half the MCL and less than or equal to (≤) the MCL, the supplier must collect at least one sample for that radionuclide every three years at that entry point.

(v) Each time sample results are received subsequent sampling frequencies will be determined as follows:

(A) If a sample result is less than or equal to (≤) the MCL:

(I) Subsequent sampling frequencies will be determined as specified in 11.22(3)(b)(iv)(A-C).

(B) If a sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly at that entry point.

(I) The supplier must continue to sample quarterly until the sample results from four consecutive quarters are less than or equal to (≤) the MCL, unless the supplier enters into another schedule as part of a formal compliance agreement with the Department.

(II) Subsequent sampling frequencies will be determined as specified in 11.22(3)(b)(iv)(A-C) based on the LRAA of the sample results.

(vi) The supplier may substitute the gross alpha particle activity sample result for the radium-226 sample result if the gross alpha particle activity sample result meets all of the following criteria:

(A) The sample result is less than or equal to (≤) 5 pCi/L.

(B) The sample result has a confidence interval of 95 percent (1.65σ, where σ is the standard deviation of the net counting rate of the sample).

(vii) The supplier may substitute the gross alpha particle activity sample result for uranium, if the gross alpha particle activity sample result meets both the following criteria:

(A) Is less than or equal to (≤) 15 pCi/L.

(B) Has a confidence interval of 95 percent (1.65σ, where σ is the standard deviation of the net counting rate of the sample).

(viii) If the supplier substitutes the gross alpha particle activity sample result for radium-226 and/or uranium, the gross alpha particle activity sample result will be used to determine the sampling frequency for radium-226 and radium-228 and/or uranium.

(A) If the gross alpha particle activity sample result is less than (<) the detection limit, one-half the detection limit for gross alpha particle activity will be used to determine compliance and the sampling frequency.

(ix) The Department may require the supplier to sample more frequently in the event of possible contamination, or when changes in the distribution system or treatment processes occur that may increase the concentration of radioactivity in finished water.

(c) Sampling Requirements for Beta Particle and Photon Radioactivity

(i) To determine compliance with the MCL for beta particle and photon radioactivity the supplier must comply with the sampling requirements specified in this section, 11.22(3)(c).

(ii) If the Department determines a system is vulnerable to beta particle and photon radioactivity, the supplier must sample at each entry point as follows:

(A) For beta emitters, quarterly.

(B) For tritium and strontium-90, annually.

(iii) If the Department determines a system uses source waters contaminated by effluents from nuclear facilities, the supplier must sample at each entry point as follows:

(A) For beta emitters, monthly.

(I) The supplier may composite three monthly samples.

(II) The supplier must submit the sample results quarterly.

(B) For iodine-131, daily for five consecutive days each quarter.

(I) The supplier must composite the samples.

(II) If iodine-131 is detected in the finished water, the Department may require the supplier to sample more frequently.

(C) For tritium and strontium-90, quarterly.

(I) The supplier may composite four consecutive quarterly samples.

(II) The supplier must submit the sample results annually.

(iv) If the Department requires the supplier to sample for beta particle and photon radioactivity, the supplier must begin sampling no later than one quarter after receiving Department notification.

(v) For systems near a nuclear facility, if the Department determines environmental surveillance data collected by the nuclear facility applies to the system, the Department may allow the supplier to use that data instead of sampling as specified 11.22(3)(c)(ii) or 11.22(3)(c)(iii).

(A) If there is a nuclear release from a nuclear facility, the supplier must begin sampling as specified in 11.22(3)(c)(ii) or 11.22(3)(c)(iii).

(vi) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity has a LRAA less than or equal to (≤) 15 pCi/L at an entry point, the Department may allow the supplier to reduce the sampling frequency at that entry point to once every three years.

(vii) If a sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to monthly at that entry point beginning the month following the exceedance.

(A) If the LRAA of three consecutive monthly samples is less than (<) the MCL, the supplier may reduce the sampling frequency to quarterly.

(B) After reducing the sampling frequency to quarterly, the Department may allow the supplier to further reduce the sampling frequency as specified in 11.22(3)(c)(vi).

(viii) The supplier must continue to sample until the Department reviews and either reaffirms or removes the designation that the system is vulnerable to beta particle and photon radioactivity contamination.

11.22(4) Compliance Determination for Radionuclides

(a) General Compliance Determination for Radionuclides

(i) If the supplier samples more frequently than annually, MCL compliance is based on the LRAA:

(A) If a confirmation sample is required, the original sample result will be replaced with the average of the original sample result and the confirmation sample result when calculating the LRAA.

(I) If the supplier fails to collect the confirmation sample, the original sample result will be used when calculating the LRAA.

(B) If a sample result is less than (<) the cited detection limit, the sample result will be given a value of zero when calculating the LRAA.

(I) If the supplier is substituting the gross alpha particle activity sampling result for radium-226 and/or uranium and the sample result is less than (<) the cited detection limit, the sample result will be given a value of one-half the cited detection limit to calculate the LRAA for radium-226 and/or uranium.

(C) If the supplier collects more than the required number of samples, all sample results must be used to determine compliance.

(ii) The Department may determine compliance or initiate enforcement action based on sample results and other information gathered by Department representatives and agencies.

(b) Additional Compliance Determination for Beta Particle and Photon Radioactivity

(i) In addition to the compliance determination requirements specified in 11.22(4)(a), the supplier must comply with the requirements specified in this section, 11.22(4)(b), to determine compliance with the gross beta particle and photon radioactivity MCL.

(ii) The supplier may analyze for naturally occurring potassium-40 beta particle activity from the same sample used for the gross beta particle activity analysis.

(iii) The supplier may subtract the potassium-40 beta particle activity result from the total gross beta particle activity result to determine if the screening level, 15 pCi/L, is exceeded.

(iv) The potassium-40 beta particle activity must 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 is greater than the screening level of (>) 15 pCi/L:

(A) The sample must be analyzed to identify the major radioactive constituents present in the sample.

(B) To determine compliance with the MCL, the appropriate doses must be calculated and summed.

(I) Except tritium and strontium-90, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of 2 liter per day drinking water intake using the 168 hour data list in the Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure, NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce.

(a) Copies of this document are available from the National Technical Information Service, NTIS ADA 280 282, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. The toll-free number is 800-553-6847. Copies may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

(II) To determine compliance, doses must also be calculated and combined for measured levels of tritium and strontium as specified in Table 11.22-II below.

TABLE 11.22-II AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE A TOTAL BODY OR ORGAN DOSE OF 4 mrem/yr

Radionuclide	Critical organ	picoCurie per liter (pCi/L)
Tritium	Total body	20,000
Strontium-90	Bone Marrow	8

11.22(5) MCL Violations for Radionuclides

The following constitute radionuclide MCL violations:

(a) The LRAA at any entry point is greater than (>) the MCL for any radionuclide.

(b) The LRAA, calculated before four consecutive quarters of samples have been collected at any entry point, is greater than (>) the MCL for any radionuclide, regardless of the subsequent sample results.

11.22(6) Response to MCL Violations for Radionuclides

In the event of a radionuclide MCL violation, the supplier must:

(a) Notify the Department no later than 48 hours after the violation occurs.

(b) Distribute Tier 2 public notice as specified in 11.33.

11.23 MAXIMUM RESIDUAL DISINFECTANT LEVELS RULE

11.23(1) Chlorine and Chloramines MRDL

(a) Applicability for Chlorine and Chloramines MRDL

For all community and non-transient, non-community water systems that supply water treated with chlorine or chloramines, the supplier must comply with the requirements specified in this section, 11.23(1).

(b) MRDL Requirements for Chlorine and Chloramines

(i) The chlorine and chloramines MRDLs are as follows:

TABLE 11.23-I MRDLs FOR CHLORINE AND CHLORAMINES	
Disinfectant	MRDL (mg/L as Cl_2)
Chlorine	4.0
Chloramines	4.0

(ii) The BATs for achieving compliance with the MRDLs for chlorine and chloramines are specified in 40 CFR 141.65(c).

(iii) To protect public health, the supplier may increase residual disinfectant concentration in the distribution system to a level greater than (>) the MRDL for a time necessary to address specific microbiological contamination problems caused by circumstances including but not limited to:

(A) Distribution system line breaks.

(B) Storm run-off events.

(C) Source water contamination events.

(D) Backflow contamination events.

(c) Monitoring Requirements for Chlorine and Chloramines

(i) To determine compliance with the MRDLs for chlorine and/or chloramines, the supplier must monitor the residual disinfectant concentration in the distribution system at the same time and at the same locations that total coliform samples are collected under 11.16, as identified in the supplier's sample siting plan under 11.16(3).

(A) The supplier may use the results of samples collected under 11.8(3)(c)(i)(B) or 11.11(2)(c)(i)(B) to satisfy both the requirements specified in this section, 11.23(1), and 11.8(3)(c)(i)(B) or 11.11(2)(c)(i)(B).

(d) Compliance Determination for Chlorine and Chloramines

(i) Compliance with the MRDL for chlorine or chloramines is determined quarterly based on the RAA of all sample results collected.

(A) If the supplier collects more than one sample in a month, the supplier must average all sample results collected that month to get the monthly average.

(I) The supplier must use the monthly average in the RAA calculation.

(B) If the supplier switches between the use of chlorine and chloramines for disinfection during the year, the supplier must include all sample results for both chlorine and chloramines in calculating the RAA and determining compliance.

(C) If the supplier collects samples under the conditions specified in 11.23(1)(b)(iii), the supplier should not include those sample results in calculating the RAA.

(e) MRDL Violations for Chlorine and Chloramines

(i) The following constitute chlorine and/or chloramines MRDL violations:

(A) The RAA is greater than (>) the MRDL for chlorine and/or chloramines.

(B) The RAA, calculated before four consecutive quarters of samples have been collected, is greater than (>) the MRDL for chlorine and/or chloramines regardless of the subsequent sample results.

(f) Response to MRDL Violations for Chlorine and Chloramines

(i) In the event of a chlorine and/or chloramines MRDL violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(g) Reporting Requirements for Chlorine and Chloramines

(i) The supplier must submit all of the following information no later than the 10th of the month following the end of each quarter in which samples were collected.

(A) The number of samples collected during each month of the last quarter.

(B) The monthly average of all sample results collected in each month for the last 12 months.

(C) The RAA of the monthly averages.

(D) Indicate which residual disinfectant was analyzed for each sample.

(E) Whether the MRDL was violated.

(ii) The Department may complete the calculations and determine whether the MRDL was violated, instead of having the supplier report that information.

11.23(2) Chlorine Dioxide MRDL

(a) Applicability for Chlorine Dioxide MRDL

For all systems that use chlorine dioxide for disinfection or oxidation, the supplier must comply with the requirements specified in this section, 11.23(2), when using chlorine dioxide.

(b) MRDL Requirements for Chlorine Dioxide

(i) The chlorine dioxide MRDL is as follows:

TABLE 11.23-II MRDL FOR CHLORINE DIOXIDE	
Disinfectant	MRDL (mg/L as ClO_2)
Chlorine dioxide	0.8

(ii) The BATs for achieving compliance with the MRDLs for chlorine dioxide are specified in 40 CFR 141.65(c).

(c) Monitoring Requirements for Chlorine Dioxide

(i) To determine compliance with the chlorine dioxide MRDL, the supplier must monitor the residual disinfectant concentration daily at each entry point during normal operating conditions and as identified in the monitoring plan developed under 11.5(3)(a)(v).

(A) If any daily entry point sample result is greater than (>) the MRDL, the next day, the supplier must collect three chlorine dioxide residual disinfectant concentration samples in the distribution system. The three samples must be collected at least six hours apart and at a location that is as close to the first customer as possible unless:

(I) The supplier uses chlorine to maintain a residual disinfectant concentration in the distribution system and there are one or more points where disinfection is added after the entry point (i.e., booster chlorination), then the supplier must collect one sample at each of the following locations:

(a) As close to the first customer as possible.

(b) At a location representative of average residence time.

(c) At a location representative of maximum residence time.

(d) Compliance Determination for Chlorine Dioxide

If the supplier collects more than the required number of samples, all sample results must be used to determine compliance.

(e) MRDL Violations for Chlorine Dioxide

(i) The following constitute acute chlorine dioxide MRDL violations:

(A) Any daily entry point sample result is greater than (>) the MRDL and on the next day one or more of the three additional distribution system sample results is greater than (>) the MRDL.

(B) The supplier fails to collect any of the three additional distribution system samples the day after a daily entry point sample result was greater than (>) the MRDL.

(ii) The following constitute non-acute chlorine dioxide MRDL violations:

(A) Any two consecutive daily entry point sample results are greater than (>) the MRDL and all three additional distribution system results are less than or equal to (≤) the MRDL.

(B) The supplier fails to collect a daily entry point sample the day after a daily entry point sample result was greater than (>) the MRDL.

(f) Response to MRDL Violations for Chlorine Dioxide

(i) In the event of an acute chlorine dioxide MRDL violation, the supplier must:

(A) Notify the Department of the violation and initiate consultation as soon as possible but no later than 24 hours after the violation occurs.

(B) Distribute Tier 1 public notice as specified in 11.33.

(C) For an acute MRDL violation specified in 11.23(2)(e)(i)(A), take immediate corrective action to lower the level of chlorine dioxide to less than (<) the MRDL.

(ii) In the event of a non-acute chlorine dioxide MRDL violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(C) For an MRDL violation specified in 11.23(2)(e)(ii)(A), take corrective action to lower the level of chlorine dioxide to less than (<) the MRDL at the entry point.

(g) Reporting Requirements for Chlorine Dioxide

(i) The supplier must submit the following information no later than the 10th of the month following the end of each quarter in which samples were collected:

(A) The dates, results, and locations of samples collected during the last quarter.

(B) Whether an MRDL violation occurred and whether the resulting violation was acute or non-acute.

(ii) The Department may complete the calculations and determine whether the MRDL was violated, instead of having the supplier report that information.

11.24 DISINFECTION BYPRODUCT PRECURSORS RULE

11.24(1) Applicability and Definitions for Disinfection Byproduct Precursors

(a) For all community and non-transient, non-community surface water systems that use conventional filtration treatment, the supplier must comply with the disinfection byproduct precursor requirements specified in this rule.

(b) “DISINFECTION BYPRODUCT PRECURSORS” means the natural organic and inorganic compounds that react with chemical disinfectants in water to form disinfection byproducts.

(c) “ENHANCED COAGULATION” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

(d) "ENHANCED SOFTENING" means the improved removal of disinfection byproduct precursors by precipitative softening.

(e) "PAIRED TOC SAMPLE SET" means one source water TOC sample and one treated water TOC sample collected at the same time during normal operating conditions.

(i) The source water TOC sample must be representative of influent water quality.

(ii) The treated water TOC sample must be collected before or at the point of combined filter effluent turbidity monitoring and must represent the treated water.

(f) "SPECIFIC ULTRAVIOLET ABSORPTION" or "SUVA" means specific ultraviolet absorption at 254 nanometers, an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption, in 1/m, at a wavelength of 254 nm (i.e., UV254) by its concentration of dissolved organic carbon, in mg/L.

11.24(2) Treatment Technique Requirements for Disinfection Byproduct Precursors

(a) For each conventional filtration treatment plant, the supplier must comply with one of the following:

(i) The disinfection byproduct precursor treatment technique by meeting the Step 1 TOC removal requirements as specified in 11.24(5).

(ii) The disinfection byproduct precursor treatment technique requirements by meeting at least one of alternative compliance criteria specified in 11.24(7).

(iii) The disinfection byproduct precursor treatment technique by meeting the Step 2 TOC removal requirements as specified in 11.24(6).

(iv) Have a disinfection byproduct precursor waiver as specified in 11.24(6)(j).

(b) For compliance with the Step 1 or Step 2 TOC removal requirements, the supplier must operate with enhanced coagulation or enhanced softening.

11.24(3) Sampling Requirements for Disinfection Byproduct Precursors Treatment Technique Requirements

(a) To determine compliance with the disinfection byproduct precursor treatment technique requirements, the supplier must sample TOC and source water alkalinity as specified in this section, 11.24(3) and as identified in the monitoring plan developed under 11.5(3)(a)(v).

(b) For each conventional filtration treatment plant, the supplier must collect one routine paired TOC sample set and one routine source water alkalinity sample each month.

(i) The source water alkalinity sample must be collected at the same time as the paired TOC sample set and must be representative of influent water quality.

(c) The supplier may reduce the sampling frequency to quarterly at each treatment plant if the RAA of the monthly treated water TOC sample results meets one of the following criteria:

(i) Is less than (<) 1.0 mg/L for one year.

(ii) Is less than (<) 2.0 mg/L for two consecutive years.

(d) If the supplier is sampling at a reduced sampling frequency and the RAA of quarterly treated water TOC sample results is greater than or equal to (≥) 2.0 mg/L, the supplier must return to the routine monthly sampling frequency.

(e) For suppliers that intend to comply with the disinfection byproduct precursor treatment technique requirements by meeting one of the alternative compliance criteria specified in 11.24(7)(b)(v-vii), the supplier must also sample the necessary optional parameters to demonstrate compliance with the applicable alternative compliance criteria (i.e., specific ultraviolet absorption or magnesium hardness) at the same locations and sampling frequency as the paired TOC sample set.

11.24(4) Compliance Options for Disinfection Byproduct Precursors

For each conventional filtration treatment plant, the supplier must comply with the Step 1 TOC removal requirements under 11.24(5), unless one or more of the following criteria are met:

(a) The supplier complies with at least one of the alternative compliance criteria specified in 11.24(7).

(b) For systems using enhanced coagulation, the Department approves the supplier to comply with the Step 2 TOC removal requirements specified in 11.24(6).

(c) The supplier has a Department-approved waiver from enhanced coagulation requirements as specified in 11.24(6)(j).

11.24(5) Step 1 TOC Removal Requirements

To comply with the Step 1 TOC removal requirements, the supplier must achieve the applicable Step 1 required TOC percent removals in Table 11.24-I based on the source water TOC sample results and the source water alkalinity sample results collected under 11.24(3).

(a) For systems that use softening, the supplier must comply with the Step 1 required TOC percent removal based on the source water TOC sample results and the far-right column, Source water alkalinity >120 mg/L, regardless of the source water alkalinity sample results collected under 11.24(3).

TABLE 11.24-I STEP 1 TOC PERCENT REMOVAL REQUIREMENTS

	Source water alkalinity, mg/L as $CaCO_3$		
	0-60	>60-120	>120
Source water TOC, mg/L	Required step 1 TOC percent removal		
>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

11.24(6) Step 2 TOC Removal Requirements

(a) For systems using enhanced coagulation, if the supplier fails to achieve the Step 1 TOC removal requirement and the alternative compliance criteria, either due to water quality parameters or operational constraints, the supplier must apply to the Department for approval of alternative minimum TOC removal requirements (Step 2 TOC removal requirements) as specified in this section, 11.24(6), and if approved comply with the Step 2 TOC removal requirements.

(b) No later than three months after the system fails to comply with the Step 1 TOC removal requirements and the alternative compliance criteria, the supplier must:

(i) Complete bench- or pilot-scale testing to determine the recommended Step 2 TOC percent removal.

(ii) Apply to the Department for approval of the recommended Step 2 TOC percent removal.

(A) If approved, this value is the Step 2 required TOC percent removal that will be used for determining compliance with the Step 2 TOC removal requirements.

(iii) Include the results of the bench- or pilot-scale testing in the Step 2 TOC removal requirements application.

(c) For the required bench- or pilot-scale testing, the supplier must incrementally add 10 mg/L of alum, or equivalent addition of iron coagulant, to a representative source water sample until the pH is reduced to a level less than or equal to (≤) the applicable Step 2 target pH specified in Table 11.24-II.

(i) If the source water alkalinity is less than or equal to (≤) 60 mg/L and the pH is reduced to less than (<) 5.5 before significant TOC removal occurs, the supplier must adjust the pH to between 5.3 and 5.7 until a TOC removal of less than (<) 0.3 mg/L per incremental addition of alum, or equivalent addition of iron coagulant, is reached.

TABLE 11.24-II STEP 2 TARGET pH	
Source water alkalinity (mg/L as $CaCO_3$)	Target pH
0–60	5.5
>60–120	6.3
>120–240	7.0
>240	7.5

(d) At the coagulant dose of alum, or equivalent addition of iron coagulant, where the TOC removal is less than (<) 0.3 mg/L, the supplier must calculate the recommended Step 2 TOC percent removal from the results of the bench- or pilot-scale testing as follows:

(i) The recommended Step 2 TOC percent removal is equal to:

(1-(treated water TOC result ÷ source water TOC result)) x 100

(e) The results of the bench- or pilot-scale testing shall be used by the Department to assess the recommended Step 2 TOC percent removal submitted by the supplier.

(i) If the Department approves the recommended Step 2 TOC percent removal, the Department may make the Step 2 required TOC percent removal retroactive for the purposes of determining compliance.

(f) Until the Department approves the recommended Step 2 TOC percent removal, the supplier must either comply with the Step 1 TOC removal requirements as specified in 11.24(5) or the alternative compliance criteria as specified in 11.24(7).

(g) If approved by the Department, the Step 2 required TOC percent removal supersedes the Step 1 required TOC percent removal specified in Table 11.24-I.

(h) If the supplier completes a new bench- and pilot-scale test and the Department approves a new Step 2 required TOC percent removal, the previous Step 2 required TOC percent removal will no longer be effective.

(i) The supplier may operate the treatment plant at any coagulant dose or pH necessary to achieve the Step 2 required TOC percent removal as long as it is consistent with other requirements of the *Colorado Primary Drinking Water Regulations*.

(j) The supplier may apply to the Department for a waiver from enhanced coagulation requirements if the water is deemed to contain TOC not amenable to enhanced coagulation.

(i) The water is deemed to contain TOC not amenable to enhanced coagulation if the TOC removal in the bench- or pilot-scale testing is consistently less than (<) 0.3 mg/L of TOC per incremental addition of alum at all dosages, or equivalent addition of iron coagulant.

11.24(7) Alternative Compliance Criteria Requirements for Disinfection Byproduct Precursors

(a) If the supplier complies with any of the alternative compliance criteria in any quarter, the supplier is not required to comply with the Step 1 or Step 2 TOC removal requirements for that quarter.

(b) The alternative compliance criteria are as follows:

(i) The LRAA of the source water TOC sample results is less than (<) 2.0 mg/L.

(ii) The LRAA of the treated water TOC sample results is less than (<) 2.0 mg/L.

(iii) Sample results demonstrate all of the following:

(A) The LRAA of source water TOC is less than (<) 4.0 mg/L.

(B) The LRAA of source water alkalinity is greater than (>) 60 mg/L (as $CaCO_3$).

(C) The RAAs of TTHM and HAA5 samples are less than (<) 0.040 mg/L and 0.030 mg/L, respectively.

(iv) For systems using only chlorine for primary disinfection and maintenance of the residual disinfectant concentration in the distribution system, the RAA of the TTHM and HAA5 sample results are less than (<) 0.040 mg/L and 0.030 mg/L, respectively.

(v) The LRAA of source water SUVA is less than or equal to (≤) 2.0 L/mg-m.

(vi) The LRAA of finished water SUVA is less than or equal to (≤) 2.0 L/mg-m.

(vii) For systems using softening, the LRAA of removed magnesium hardness is greater than or equal to (≥) 10 mg/L (as $CaCO_3$).

(viii) For systems using softening, the LRAA of treated water alkalinity is less than (<) 60 mg/L (as $CaCO_3$).

11.24(8) Compliance Determination for Step 1 and Step 2 TOC Removal

(a) To determine compliance with the Step 1 or Step 2 TOC removal requirements, the supplier must calculate compliance quarterly based on a LRAA as follows:

(i) Determine the actual monthly TOC percent removal.

The actual monthly TOC percent removal is equal to: (1-(treated water TOC sample result ÷ source water TOC sample result)) ×t; 100

(ii) Determine the required monthly TOC percent removal:

(A) If the supplier is determining compliance with the Step 1 TOC removal requirements, refer to Table 11.24-I for the Step 1 required TOC percent removal.

(B) If the supplier is determining compliance with the Step 2 TOC removal requirements, use the Department-approved Step 2 required TOC percent removal.

(iii) Determine the monthly removal ratio.

The monthly removal ratio is equal to: (actual monthly TOC percent removal ÷ required monthly TOC percent removal)

(A) If one or more of the following conditions apply, the supplier may substitute a value of 1.0 for the monthly removal ratio in that month:

(I) The source water or treated water TOC sample result(s) is less than (<) 2.0 mg/L.

(II) The source water or finished water SUVA is less than (<) 2.0 L/mg-m.

(III) For systems using enhanced softening, treated water alkalinity is less than (<) 60 mg/L (as $CaCO_3$).

(IV) For systems using enhanced softening, removed magnesium hardness (as $CaCO_3$) is greater than or equal to (≥) 10 mg/L.

(iv) Determine the LRAA of the monthly removal ratios.

(b) For new or reclassified systems that now meet the applicability of this rule, the supplier must begin determining compliance after collecting 12 months of data.

11.24(9) Treatment Technique Violations and Response for Disinfection Byproduct Precursors

(a) If the supplier fails to comply with any of the alternative compliance criteria and the LRAA of the monthly removal ratios is less than (<) 1.00 as calculated for Step 1 or Step 2 TOC removal requirements, a disinfection byproduct precursors treatment technique violation occurs.

(b) In the event of disinfection byproduct precursors treatment technique violation, the supplier must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 2 public notice as specified in 11.33.

11.24(10) Reporting Requirements for Disinfection Byproduct Precursors

(a) The supplier must submit all of the following information no later than the 10th of the month following the end of each quarter in which samples were collected:

(i) The number of paired TOC sample sets collected during the last quarter.

(ii) The location, date, and results of each paired TOC sample set and each associated alkalinity sample collected during the last quarter.

(iii) If the supplier is complying with either the Step 1 or Step 2 TOC removal requirements as specified in 11.24(5) and 11.24(6):

(A) For each month in the quarter that paired TOC sample sets were collected, the monthly removal ratio for each paired TOC sample set and the required TOC percent removal.

(B) Compliance calculations for determining TOC percent removals as specified in 11.24(8).

(C) Whether the system is in compliance with the Step 1 or Step 2 TOC removal requirements as specified in 11.24(5) and 11.24(6) for the last four quarters.

(iv) If the supplier meets one or more of the alternative compliance criteria as specified in 11.24(7):

(A) The alternative compliance criterion that the supplier is using for compliance and whether the system is in compliance with that particular alternative compliance criterion.

(B) For systems meeting the criteria specified in 11.24(7)(b)(i) or 11.24(7)(b)(iii), the LRAA of source water TOC.

(C) For systems meeting the criterion specified in 11.24(7)(b)(ii), the LRAA of treated water TOC.

(D) For systems meeting the criteria specified in 11.24(7)(b)(iii), the LRAA of source water alkalinity.

(E) For systems meeting the criteria specified in 11.24(7)(b)(iii) or 11.24(7)(b)(iv), the RAA for both TTHM and HAA5.

(F) For systems meeting the criterion specified in 11.24(7)(b)(v), the LRAA of source water SUVA.

(G) For systems meeting the criterion specified in 11.24(7)(b)(vi), the LRAA of finished water SUVA.

(H) For systems meeting the criterion specified in 11.24(7)(b)(vii), the LRAA of monthly removed magnesium hardness (as $CaCO_3$ in mg/L).

(I) For systems meeting the criterion specified in 11.24(7)(b)(viii), the LRAA of treated water alkalinity.

(b) The Department may complete the calculations and determine whether the treatment technique was met, instead of having the supplier report that information.

11.25 DISINFECTION BYPRODUCTS RULE

11.25(1) Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5)

(a) Applicability and Definitions for TTHM and HAA5

(i) For all community water systems and non-transient, non-community water systems that supply water treated with a primary or residual disinfectant other than ultraviolet light, the supplier must comply with the requirements specified in this section, 11.25(1).

(ii) "DUAL SAMPLE SET" means a set of two samples collected at the same time and same location for the purposes of determining compliance with the TTHM and HAA5 MCLs. One sample is analyzed for TTHM and the other is analyzed for HAA5.

(iii) "INITIAL DISTRIBUTION SYSTEM EVALUATION REPORT" or "IDSE REPORT" means a report resulting from a historical requirement where the supplier identified sampling locations that represent high TTHM and HAA5 concentrations in the distribution system.

(A) IDSE Reports include:

(I) Historical TTHM and HAA5 individual sampling results and LRAAs;

(II) A schematic of the distribution system;

(III) The population supplied;

(IV) System type; and

(V) A recommendation and explanation of sampling timing and locations that will represent the highest TTHM and HAA5 concentrations.

(a) The supplier must include the peak historical month for TTHM and HAA5 concentrations in the recommendation, unless the Department approved another month to collect samples.

(B) For new systems or reclassified systems that now meet the applicability of this rule, the supplier is not required to complete an IDSE Report.

(iv) "HALOACETIC ACIDS" or "HAA5" means the sum of the concentrations in mg/L of the five regulated haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

(v) "TOTAL TRIHALOMETHANES" or "TTHM" means the sum of the concentrations in mg/L of the four regulated trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]), rounded to two significant figures after addition.

(b) MCL Requirements for TTHM and HAA5

(i) The TTHM and HAA5 MCLs are as follows:

TABLE 11.25-I MCLs FOR TTHM AND HAA5	
Disinfection byproduct	MCL (mg/L)
Total trihalomethanes (TTHM)	0.080
Haloacetic acids (five) (HAA5)	0.060

(ii) The BATs for achieving compliance with the MCLs for TTHM and HAA5 are specified in 40 CFR 141.64(b)(2)(ii).

(iii) The BATs for achieving compliance with the MCLs for TTHM and HAA5 for consecutive systems which only apply to the disinfected water that the consecutive system buys or receives are specified in 40 CFR 141.64(b)(2)(iii).

(c) Sampling Requirements for TTHM and HAA5

(i) To determine compliance with the MCLs for TTHM and HAA5, the supplier must comply with the sampling requirements specified in this section, 11.25(1)(c).

(ii) If the supplier submitted an IDSE report, the supplier must sample for TTHM and HAA5 at the sampling locations and in the months recommended in the IDSE report, unless the Department requires other or additional sampling locations or months.

(iii) If the supplier did not submit an IDSE report, the supplier must select TTHM and HAA5 sampling locations as follows, unless the Department requires other or additional locations:

(A) Alternate between selecting sampling locations that represent high TTHM concentrations and sampling locations that represent high HAA5 concentrations until the required number of sampling locations, as specified in Table 11.25-II, have been identified.

(B) For systems not chemically disinfecting, if the supplier begins using a chemical disinfectant, the supplier must consult with the Department to identify TTHM and HAA5 sampling locations.

(iv) For routine sampling, the supplier must sample at the number of sampling locations and at the sampling frequencies specified in Table 11.25-II.

TABLE 11.25-II ROUTINE SAMPLING LOCATIONS AND FREQUENCIES

Source water type	Population supplied	Sampling frequency	Number of sampling locations and sample type
Surface Water	<500	annually	1 individual sample for TTHM collected at the sampling location with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location with the highest HAA5 concentration; or 1 dual sample set if the highest TTHM and HAA5 concentrations occur at the same sampling location and in the same month.
Surface Water	500 – 3,300	quarterly	1 individual sample for TTHM collected at the sampling location with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location with the highest HAA5 concentration.
Surface Water	3,301 – 9,999	quarterly	2 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Surface Water	10,000 – 49,999	quarterly	4 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Surface Water	50,000 – 249,999	quarterly	8 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Surface Water	250,000 – 999,999	Quarterly	12 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Surface Water	1,000,000 – 4,999,999	quarterly	16 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).

Source water type	Population supplied	Sampling frequency	Number of sampling locations and sample type
Surface Water	≥ 5,000,000	quarterly	20 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Groundwater	<500	annually	1 individual sample for TTHM collected at the sampling location with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location with the highest HAA5 concentration; or 1 dual sample set if the highest TTHM and HAA5 concentrations occurred at the same sampling location and in the same month.
Groundwater	500 – 9,999	annually	2 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Groundwater	10,000 – 99,999	quarterly	4 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Groundwater	100,000 – 499,999	quarterly	6 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).
Groundwater	≥ 500,000	quarterly	8 dual sample sets at sampling locations as specified in 11.25(1)(c)(ii) or 11.25(1)(c)(iii).

(v) For routine sampling, the supplier must collect samples during the month when the highest TTHM and HAA5 concentrations occur.

(vi) For routine, reduced, or increased sampling, if the supplier is on a quarterly sampling frequency, the supplier must collect samples at least every 90 days.

(vii) The supplier may reduce the sampling frequency and/or the number of sampling locations as specified in Table 11.25-III if all of the following criteria are met:

(A) The LRAA for TTHM is less than or equal to (≤) 0.040 mg/L at all sampling locations.

(B) The LRAA for HAA5 is less than or equal to (≤) 0.030 mg/L at all sampling locations.

(C) For surface water systems, the LRAA of the source water TOC samples is less than or equal to (≤) 4.0 mg/L at each surface water treatment plant.

(I) If the supplier is required to sample as specified in 11.24(3), the supplier must use these TOC sample results to determine the LRAA.

(II) If the supplier is not required to sample as specified in 11.24(3), the supplier must collect optional source water TOC samples every 30 days for at least 12 months and use these optional TOC sample results to determine the LRAA.

(a) If the supplier chooses to sample source water TOC and the system subsequently qualifies for reduced TTHM and HAA5 sampling, the supplier must continue to sample the source water for TOC but may reduce the sampling frequency to at least every 90 days.

TABLE 11.25-III REDUCED SAMPLING LOCATIONS AND FREQUENCIES

Source water type	Population supplied	Sampling frequency	Number of sampling locations and sample type
Surface Water	<500	The sampling may not be reduced.	The sampling cannot be reduced.
Surface Water	500 – 3,300	annually	1 individual sample for TTHM collected at the sampling location and during the quarter with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location and during the quarter with the highest HAA5 concentration; or 1 dual sample set if the highest TTHM and HAA5 concentrations occurred at the same sampling location and in the same quarter.
Surface Water	3,301 – 9,999	annually	2 dual sample sets with 1 collected at the sampling location and during the quarter with the highest TTHM concentration and 1 collected at the sampling location and during the quarter with the highest HAA5 concentration.
Surface Water	10,000 – 49,999	quarterly	2 dual sample sets collected at the sampling locations with the highest TTHM and highest HAA5 LRAAs.
Surface Water	50,000 – 249,999	quarterly	4 dual sample sets collected at the sampling locations with the 2 highest TTHM and 2 highest HAA5 LRAAs.
Surface Water	250,000 – 999,999	quarterly	6 dual sample sets collected at the sampling locations with the 3 highest TTHM and 3 highest HAA5 LRAAs.
Surface Water	1,000,000 – 4,999,999	quarterly	8 dual sample sets collected at the sampling locations with the 4 highest TTHM and 4 highest HAA5 LRAAs.
Surface Water	≥ 5,000,000	quarterly	10 dual sample sets collected at the sampling locations with the 5 highest TTHM and 5 highest HAA5 LRAAs.
Groundwater	<500	every third calendar year	1 individual sample for TTHM collected at the sampling location and during the quarter with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location and during the quarter with the highest HAA5 concentration; or 1 dual sample set if the highest TTHM and HAA5 concentrations occurred at the same sampling location and in the same quarter.
Groundwater	500 – 9,999	annually	1 individual sample for TTHM collected at the sampling location and during the quarter with the highest TTHM concentration and 1 individual sample for HAA5 collected at the sampling location and during the quarter with the highest HAA5 concentration; or 1 dual sample set if the highest TTHM and HAA5 concentrations occurred at the same sampling location and in the same quarter.

Source water type	Population supplied	Sampling frequency	Number of sampling locations and sample type
Groundwater	10,000 – 99,999	annually	2 dual sample sets with 1 collected at the sampling location and during the quarter with the highest TTHM concentration and 1 collected at the location and during the quarter with the highest HAA5 concentration.
Groundwater	100,000 – 499,999	quarterly	2 dual sample sets at the sampling locations with the highest TTHM and highest HAA5 LRAAs.
Groundwater	≥ 500,000	quarterly	4 dual sample sets collected at the sampling locations with the 2 highest TTHM and 2 highest HAA5 LRAAs.

(viii) If the supplier is sampling at a reduced sampling frequency and/or at the reduced number of sampling locations, the supplier must return to the routine sampling frequency and the routine number of sampling locations specified in Table 11.25-II if one or more of the following criteria are met:

(A) For surface water systems, the LRAA of the source water TOC samples collected under 11.24(3) or 11.25(1)(c)(vii)(C)(II), is greater than (>) 4.0 mg/L at any surface water treatment plant.

(B) For a supplier sampling at a quarterly sampling frequency, the TTHM LRAA is greater than (>) 0.040 mg/L or the HAA5 LRAA is greater than (>) 0.030 mg/L.

(C) For a supplier sampling at an annual or less frequent sampling frequency, any individual TTHM sample is greater than (>) 0.060 mg/L or any individual HAA5 sample is greater than (>) 0.045 mg/L at any sampling location.

(ix) If the supplier is sampling at an annual or less frequent sampling frequency and any individual TTHM sample result is greater than (>) 0.080 mg/L or any individual HAA5 sample result is greater than (>) 0.060 mg/L, the supplier must increase the sampling to dual sample sets collected quarterly at all sampling locations.

(A) The supplier may return to routine sampling at the frequency and at the number of sampling locations specified in Table 11.25-II if all of the following criteria are met:

(I) The supplier conducted increased sampling for at least four consecutive quarters.

(II) The LRAA is less than or equal to (≤) 0.060 mg/L for TTHM and less than or equal to (≤) 0.045 mg/L for HAA5 at all sampling locations.

(d) Sampling Plan for TTHM and HAA5

(i) The supplier must develop and comply with a TTHM and HAA5 individual rule sampling plan as part of the system's monitoring plan specified in 11.5.

(A) If the supplier submitted an IDSE report that includes all the information required by this section, 11.25(1)(d), the supplier is not required to develop the individual rule sampling plan.

(B) The sampling plan must consist of all of the following:

(I) Sampling locations.

(II) Sampling dates.

(III) Compliance calculation procedures.

(IV) The rationale for identifying the sampling locations as having high concentrations of TTHM or HAA5.

(V) For consecutive systems, if the Department has reduced the sampling requirements for the supplier responsible for the consecutive system under 11.42(4), the sampling plans for all other systems included in the combined distribution system.

(C) The sampling plan must be complete no later than the date the supplier collects the first TTHM or HAA5 sample.

(D) The supplier must keep the sampling plan on file for Department and public review.

(ii) For surface water systems supplying greater than (>) 3,300 people, the supplier must submit a copy of the sampling plan no later than the date the supplier collects the first TTHM or HAA5 sample.

(iii) The supplier may revise the sampling plan to reflect changes in treatment, distribution system operations and layout, other factors that may affect TTHM or HAA5 formation or for Department-approved reasons after consulting with the Department regarding the need and appropriateness of changes.

(A) If the supplier revises the sampling locations, the supplier must replace the existing sampling locations with the lowest LRAA with new locations that reflect the highest expected TTHM or HAA5 concentrations.

(iv) The Department may require the supplier to revise the sampling plan.

(v) If the supplier revises the sampling plan, the supplier must submit a copy of the revised sampling plan before the Department-specified date that the supplier must comply with the revised sampling plan.

(e) Operational Evaluation Levels for TTHM and HAA5

(i) The supplier must calculate operational evaluation levels for TTHMs and HAA5s quarterly as follows:

(A) The sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4.

(B) The sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4.

(ii) If the operational evaluation level is greater than (>) 0.080 mg/L for TTHM or greater than (>) 0.060 mg/L for HAA5 at any monitoring location, the supplier must:

(A) Complete an operational evaluation that includes all of the following:

(I) An examination of the system's treatment and distribution operational practices for all of the following:

(a) Storage tanks.

(b) Excess storage capacity.

(c) Distribution system flushing.

(d) Treatment changes or failures that may contribute to TTHM and HAA5 formation.

(II) Changes in sources or source water quality.

(III) Steps to consider for minimizing future exceedances.

(B) Submit an operational evaluation report no later than 90 days after being notified of the sample result(s) that caused the system to exceed the operational evaluation level.

(I) The operational evaluation report must be made available to the public upon request.

(f) Compliance Determination for TTHM and HAA5

(i) If the supplier samples at a quarterly frequency, MCL compliance is based on the LRAA.

(A) For new systems or reclassified systems that now meet the applicability of this rule, the supplier must calculate the LRAA after the end of the fourth quarter of required sampling or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters.

(B) If the supplier collects more than one sample in a quarter at a sampling location, the supplier must average all sample results collected in the quarter at that sampling location to determine a quarterly average to be used in the LRAA calculation instead of the individual sample results.

(ii) If the supplier samples at an annual or less frequent sampling frequency, compliance is based on each individual sample result.

(A) If any sample result is greater than (>) the MCL, the supplier must increase the sampling frequency to quarterly sampling as specified in 11.25(1)(c)(ix). This sample will count as the first quarterly sample. Compliance with the MCLs will be determined after the fourth quarter of required sampling.

(B) For new or reclassified systems that now meet the applicability of this rule, the supplier must determine compliance beginning with the first sample collected.

(g) MCL Violations for TTHM and HAA5

(i) The following constitute TTHM and/or HAA5 MCL violations:

(A) The LRAA at any sampling location is greater than (>) the MCL for TTHM and/or HAA5.

(B) The LRAA, calculated before four consecutive quarters of samples have been collected at a sampling location, is greater than (>) the MCL for TTHM and/or HAA5 regardless of the subsequent sample results.

(h) Response to MCL Violations for TTHM and HAA5

(i) In the event of a TTHM and/or HAA5 MCL violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(i) Reporting Requirements for TTHM and HAA5

(i) The supplier must submit all of the following information for each sampling location no later than the 10th of the month following the end of each quarter in which the sample(s) was collected:

(A) Number of samples collected during the last quarter.

(B) Date each sample was collected.

(C) Results of each sample collected during the last quarter.

(D) If the supplier is required to sample at a quarterly frequency, LRAA(s).

(I) For new systems or reclassified systems that now meet the applicability of this rule, the supplier must begin submitting the LRAA after the end of the fourth quarter that the supplier is required to sample.

(E) Whether the MCL was exceeded at any sampling location.

(F) Whether the operational evaluation level(s) was exceeded during the quarter.

(I) If the operational evaluation level(s) was exceeded, the supplier must submit the location and date of the exceedance and the calculated operational evaluation level(s).

(ii) For the supplier of a surface water system seeking to qualify for, or remain on, reduced TTHM and HAA5 sampling, the supplier must submit all of the following source water TOC information for each surface water treatment plant no later than the 10th of the month following the end of each quarter in which samples were collected:

(A) Number of source water TOC samples collected each month during the last quarter.

(B) Date each TOC sample was collected during the last quarter.

(C) Result of each TOC sample collected during the last quarter.

(D) The quarterly average of monthly TOC samples collected during the last quarter or the result of the quarterly sample.

(E) The LRAA of quarterly averages.

(F) Whether the LRAA was greater than (>) 4.0 mg/L.

(iii) The Department may choose to complete the calculations and determine whether the MCL was violated or whether the supplier is eligible for reduced sampling instead of having the supplier report that information.

11.25(2) Chlorite

(a) Applicability and Definitions for Chlorite

(i) For all community and non-transient, non-community water systems that use chlorine dioxide for disinfection or oxidation, the supplier must comply with the requirements specified in this section, 11.25(2), when using chlorine dioxide.

(ii) "THREE-SAMPLE SET" means that one chlorite sample is collected at each of the following locations:

(A) As close to the first customer as possible;

(B) At a location representative of average residence time; and

(C) At a location representative of maximum residence time.

(b) MCL Requirement for Chlorite

(i) The chlorite MCL is as follows:

TABLE 11.25-IV MCL FOR CHLORITE	
Disinfection byproduct	MCL (mg/L)
Chlorite	1.0

(ii) The BATs for achieving compliance with the MCL for chlorite are specified in 40 CFR 141.64(b)(1)(ii).

(c) Sampling Requirements for Chlorite

(i) To determine compliance with the MCL for chlorite, the supplier must comply with the sampling requirements specified in this section, 11.25(2)(c) and as identified in the monitoring plan developed under 11.5(3)(a)(v).

(ii) At each entry point that supplies water from a treatment plant using chlorine dioxide and at a time that represents normal operating conditions, the supplier must collect daily chlorite samples.

(iii) In the distribution system, the supplier must collect a routine three-sample set each month.

(iv) If any daily entry point sample result collected under 11.25(2)(c)(ii) is greater than (>) the chlorite MCL, the next day the supplier must collect a three-sample set in the distribution system in addition to the daily entry point sample.

(A) The supplier may use the results from the three-sample set collected in the distribution system to meet the routine sampling requirement specified in 11.25(2)(c)(iii).

(v) The supplier may reduce the routine three-sample set sampling frequency in the distribution system to a three-sample set each quarter if, after one year of sampling all of the following criteria are met:

(A) No individual chlorite sample result collected in the distribution system was greater than (>) the chlorite MCL.

(B) No daily entry point sample result was greater than (>) the chlorite MCL.

(vi) If the supplier is sampling at a reduced sampling frequency in the distribution system, the supplier must return to the routine monthly sampling frequency if:

(A) An individual chlorite sample in the distribution system is greater than (>) the chlorite MCL; or

(B) A daily entry point sample result is greater than (>) the chlorite MCL.

(d) Compliance Determination for Chlorite

Compliance with the MCL for chlorite is based on the average of the results of any three-sample set collected in the distribution system under 11.25(2)(c)(iii), 11.25(2)(c)(iv), or 11.25(2)(c)(v).

(e) MCL Violation and Response for Chlorite

(i) If the average of the results of any three-sample set collected in the distribution system is greater than (>) the chlorite MCL, a chlorite MCL violation occurs.

(ii) In the event of a chlorite MCL violation, the supplier must:

(A) Distribute Tier 2 public notice as specified in 11.33.

(B) Report the violation to the Department as specified in 11.25(2)(f).

(f) Reporting Requirements for Chlorite

(i) The supplier must submit all of the following information no later than the 10th of the month following the end of each quarter in which samples were collected:

(A) The number of entry point samples collected each month during the last quarter.

(B) The location, date, and sample result of each sample (both entry point and distribution system) collected during the last quarter.

(C) For each month in the quarter, the average of the results of each three-sample set collected in the distribution system.

(D) Whether the MCL was violated, in which month(s) the MCL was violated, and how many times it was violated in that month(s).

(ii) The Department may complete the calculations and determine whether the MCL was violated instead of having the supplier report that information.

11.25(3) Bromate

(a) Applicability for Bromate

For all community and non-transient, non-community water systems that use ozone for disinfection or oxidation, the supplier must comply with the requirements specified in this section, 11.25(3), when using ozone.

(b) MCL Requirement for Bromate

(i) The bromate MCL is as follows:

TABLE 11.25-V MCL FOR BROMATE	
Disinfection byproduct	MCL (mg/L)
Bromate	0.010

(ii) The BATs for achieving compliance with the MCL for bromate are specified in 40 CFR 141.64(b)(1)(ii).

(c) Sampling Requirements for Bromate

(i) To determine compliance with the MCL for bromate, the supplier must comply with the sampling requirements specified in this section, 11.25(3)(c) and as identified in the monitoring plan developed under 11.5(3)(a)(v).

(ii) At each entry point that supplies water from a treatment plant using ozone and at a time that represents normal operating conditions, the supplier must collect one routine samples each month.

(iii) The supplier may reduce the routine sampling frequency at each entry point to one sample each quarter if, during the four most recent quarters all of the following criteria are met:

(A) The LRAA of all sample results collected under 11.25(3)(c)(ii) is less than or equal to (≤) 0.0025 mg/L.

(B) Monthly samples were analyzed using Method 317.0 Revision 2.0, 326.0 or 321.8.

(iv) If the supplier is sampling at a reduced sampling frequency and the LRAA of all sample results analyzed using Method 317.0 Revision 2.0, 326.0 or 321.8 is greater than (>) 0.0025 mg/L, the supplier must return to the routine monthly sampling frequency immediately.

(d) Compliance Determination for Bromate

(i) Compliance with the MCL for bromate is determined quarterly based on the LRAA of all monthly sample results collected.

(A) If the supplier collects more than one bromate sample in a month at an entry point, the supplier must average all sample results collected that month at that entry point to get the monthly average. The supplier must use the monthly average when calculating the LRAA.

(e) MCL Violation for Bromate

(i) The following constitute bromate MCL violations:

(A) The LRAA is greater than (>) the bromate MCL.

(B) The LRAA, calculated during the first four consecutive quarters of sampling at a sampling location, is greater than (>) the MCL for bromate regardless of the subsequent sample results.

(f) Response to an MCL Violation for Bromate

(i) In the event of a bromate MCL violation, the supplier must:

(A) Distribute Tier 2 public notice as specified in 11.33.

(B) Report the violation to the Department as specified in section 11.25(3)(g).

(g) Reporting Requirements for Bromate

(i) The supplier must submit all of the following information no later than the 10th of the month following the end of each quarter in which samples were collected:

(A) The number of samples collected during the last quarter.

(B) The location, date, and sample result of each sample collected during the last quarter.

(C) The LRAA of all sample results collected in the last year.

(D) Whether the MCL was violated.

(ii) The Department may complete the calculations and determine whether the MCL was violated, instead of having the supplier report that information.

11.26 LEAD AND COPPER RULE

11.26(1) Applicability and Definitions

(a) For all community and non-transient, non-community water systems, the supplier must comply with the requirements specified in this rule.

(b) For the purposes of this rule, systems are categorized as follows:

(i) “SMALL SYSTEM” means a system that supplies less than or equal to (≤) 3,300 people.

(ii) “MEDIUM SYSTEM” means a system that supplies greater than (>) 3,300 and less than or equal to (≤) 50,000 people.

(iii) “LARGE SYSTEM” means a system that supplies greater than (>) 50,000 people.

(c) “ACTION LEVEL” means the concentration of lead or copper at which the supplier is required to comply with additional requirements, which may include public education, corrosion control treatment, source water treatment, and/or lead service line replacement.

(d) For the purposes of this rule, "COMPLIANCE PERIOD" means the overall period of time established for a requirement (e.g., six-month, annual, three year, nine year).

(e) "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.

(f) "FIRST-DRAW TAP SAMPLE" means a lead and copper tap sample that is collected, without flushing the tap, where the water has stood motionless in the plumbing system for at least six hours.

(g) "LEAD SERVICE LINE" means a service line made of lead that connects the water main to the building inlet and any lead pigtail, gooseneck or other fitting that is connected to such lead line.

(h) "MONITORING PERIOD" means the specific period within the compliance period in which the supplier is required to perform the monitoring (e.g., June – September for an annual compliance period).

(i) "NON-FIRST-DRAW TAP SAMPLE" means a lead and copper tap sample that is collected where the water has not stood motionless in the plumbing system for at least six hours.

(j) "OPTIMAL CORROSION CONTROL TREATMENT" means corrosion control treatment that minimizes the lead and copper concentrations at consumers' taps while ensuring that the treatment does not cause the water system to violate any provision of the *Colorado Primary Drinking Water Regulations*.

(k) "POINT-OF-USE TREATMENT DEVICE" or "POU" means a treatment device used for the purpose of reducing contaminants in drinking water applied to a single faucet or other point of use (i.e., drinking fountain, ice maker, etc.).

(l) "SIX-MONTH COMPLIANCE PERIOD" means the period of January 1 through June 30 or the period of July 1 through December 31.

11.26(2) Requirements for Lead and Copper Tap Sampling

(a) Site Selection for Lead and Copper Tap Samples

(i) Based on the materials evaluation conducted under 11.2(2) to identify lead, copper, and galvanized steel materials in the distribution system, the supplier must identify potential lead and copper tap sample sites and categorize each sample site as specified in Table 11.26-I.

(A) If the materials evaluation does not identify enough potential lead and copper tap sample sites, the supplier must collect all of the following information until enough potential lead and copper tap samples sites are identified:

(I) All plumbing codes, permits, and records in the files of the building departments which 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.

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

(B) The supplier must seek to collect the information specified in 11.26(2)(a)(i)(A)(I-III) where possible in the course of normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities).

TABLE 11.26-I LEAD AND COPPER TAP SAMPLE TIER CATEGORIES		
Tier category	For community water systems	For non-transient, non-community water systems
Tier 1	Sample sites must be single-family structures[2] that: Contain copper pipes with lead solder installed after 1982; Contain lead pipes; and/or Are supplied by a lead service line. [1]	Sample sites must be buildings that: Contain copper pipes with lead solder installed after 1982; Contain lead pipes; and/or Are supplied by a lead service line.
Tier 2	Sample sites must be buildings, including multiple-family residences, that: Contain copper pipes with lead solder installed after 1982; Contain lead pipes; and/or Are supplied by a lead service line.	Sample sites must be buildings that: Contain copper pipes with lead solder installed before 1983.
Tier 3	Sample sites are single-family structures that: Contain copper pipes with lead solder installed before 1983.	Not applicable.

1 If at least 20 percent of the buildings supplied by the system are multiple-family residences, the supplier may categorize the multiple-family residences as Tier 1 sample sites if the residences meet the other criteria of a Tier 1 sample site.

2 "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.

(ii) The supplier must complete a sampling pool with at least the number of sample sites specified in Table 11.26-II.

TABLE 11.26-II LEAD AND COPPER SAMPLING POOL

Population supplied	Minimum number of sites for sampling pool
Greater than (>) 100,000	100
10,001 to 100,000	60
3,301 to 10,000	40
501 to 3,300	20
101 to 500	10
Less than or equal to (100	5

(iii) The sampling pool must be completed as follows:

(A) The supplier must include all Tier 1 sample sites in the sampling pool.

(B) If the distribution system does not have enough Tier 1 sample sites to complete the sampling pool, the supplier must complete the sampling pool with Tier 2 sample sites.

(C) If the distribution system does not have enough Tier 1 and Tier 2 sample sites to complete the sampling pool, the supplier must complete the sampling pool with Tier 3 sample sites.

(D) If the supplier has an insufficient number of Tier 1, Tier 2, and Tier 3 sample sites to complete the sampling pool, the supplier must complete the sampling pool with sites that have plumbing materials commonly found throughout the distribution system based on the materials evaluation.

(iv) Sampling sites must not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

(v) If the supplier identifies that the distribution system contains lead service lines, the supplier must:

(A) Populate 50 percent of the sampling pool with sites supplied by a lead service line.

(I) If there are an insufficient number of sites supplied by a lead service line to populate 50 percent of the sampling pool, the supplier must include all of the sites supplied by the lead service lines.

(B) Populate 50 percent of the sampling pool with sites that contain lead pipes or copper pipes with lead solder.

(vi) The supplier must collect each first-draw lead and copper tap sample from the same site that was sampled in the previous monitoring period.

(A) If the supplier cannot gain entry to a site, the supplier may collect the lead and copper tap sample from another site in the sampling pool as long as the new site is from the same tier category and is near the original site.

(b) Lead and Copper Action Levels

(i) The lead and copper action levels are as follows:

TABLE 11.26-III LEAD AND COPPER ACTION LEVELS

Contaminant	Action level (mg/L)
Lead	0.015
Copper	1.3

(ii) An action level exceedance occurs when the 90th percentile of the lead or copper tap sample results collected during the monitoring period is greater than (>) the action level.

(iii) If the supplier collects more than five samples per monitoring period, the supplier must calculate the 90th percentile lead level and the 90th percentile copper level as follows:

(A) Arrange all of the tap sample results collected in a monitoring period in order from the lowest to the highest sample result.

(B) Rank each sample result from lowest to highest, beginning with the number one for the lowest sample result.

(I) The rank given to the sample with the highest sample result must equal the total number of samples collected.

(C) Multiply the total number of samples collected by 0.9. The resulting number is the 90th percentile rank.

(D) The sample result corresponding to the 90th percentile rank identified in the calculation above is the 90th percentile level.

(iv) If the supplier collects five samples per monitoring period, the 90^{th} percentile is calculated by taking the average of the highest and second highest sample results.

(v) The results of all lead and copper tap samples collected in the monitoring period must be included when calculating the 90^{th} percentile lead or copper level, this includes samples collected in addition to the minimum requirements specified in Table 11.26-IV.

(c) Collection Methods for Lead and Copper Tap Samples

(i) The supplier must collect first-draw tap samples for lead and copper from each site in the sampling pool.

(A) The supplier may allow residents to collect first-draw tap samples after instructing the residents of the proper sampling procedures.

(I) To avoid problems with residents handling nitric acid, the first-draw tap samples may be acidified up to 14 days after the sample is collected.

(ii) If a non-transient, non-community water system does not have enough sites that can supply first-draw tap samples, the supplier may apply to the Department to substitute non-first-draw tap samples at those sites.

(A) If the supplier collects non-first-draw tap samples, the supplier must identify sampling times and tap locations that would likely result in the longest standing time at the remaining sites for collecting non-first-draw tap samples.

(I) The supplier must submit the standing times and tap locations for the non-first-draw tap samples used to complete the sampling pool.

(iii) If a community water system does not have enough sites that can supply first-draw tap samples, the supplier may apply to the Department to substitute non-first-draw tap samples at those sites, as specified in 11.26(2)(c)(ii)(A), if:

(A) The system is a facility, such as a prison or a hospital, where the population supplied is unable to make improvements to plumbing or install point-of-use treatment devices; and

(B) The supplier supplies water as part of the cost of services provided and does not separately charge for water consumption.

(iv) The supplier must collect first-draw and non-first-draw tap samples as follows:

(A) Samples must be one liter in volume.

(B) For first-draw samples collected at residential housing, the samples must be collected from the cold water kitchen sink tap or bathroom sink tap.

(C) For first-draw samples collected at nonresidential buildings, the samples must be collected at an interior tap from which water is typically drawn for human consumption.

(D) For non-first-draw samples, samples must be collected at an interior tap from which water is typically drawn for human consumption.

(d) Sampling Frequency for Lead and Copper Tap Samples

(i) Using the sites from the sampling pool and based on the applicable sampling frequency, the supplier must collect at least one lead and one copper tap sample from the number of sites specified in Table 11.26-IV.

(A) If the distribution system has fewer than five taps that can be used for human consumption, the supplier must:

(I) Collect at least one sample from each tap; and

(II) Collect additional samples from those taps on different days during the monitoring period until the required number of samples has been collected.

TABLE 11.26-IV LEAD AND COPPER TAP SAMPLING SITES

Population supplied	Number of sites for six-month sampling frequency	Number of sites for annual, three-year, or nine-year sampling frequency
Greater than (>) 100,000	100	50
10,001 to 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

(ii) For new systems or reclassified systems that now meet the applicability of this rule, the supplier must begin collecting lead and copper tap samples on a six-month sampling frequency from the number of sites specified in Table 11.26-IV to comply with the initial sampling requirements.

(iii) The Department may allow the supplier to collect lead and copper tap samples at a reduced frequency.

(A) If the action levels are met for two consecutive six-month compliance periods and the supplier meets the criteria of 11.26(2)(d)(iii)(D), if applicable, the supplier may reduce the sampling frequency to annually and reduce the number of sites specified in Table 11.26-IV.

(I) The supplier must begin collecting lead and copper tap samples during the calendar year immediately following the end of the second consecutive six-month compliance period.

(B) The Department may reduce the sampling frequency to once every three calendar years and reduce the number of sites as specified in Table 11.26-IV, if the supplier meets the criteria of 11.26(2)(d)(iii)(D), if applicable, and either:

(I) The action levels are met during three consecutive years of sampling; or

(II) The 90th percentile for lead is less than or equal to (≤) 0.005 mg/L and the 90th percentile for copper is less than or equal to (≤) 0.65 mg/L during two consecutive six-month compliance periods.

(C) If the supplier is on a three-year sampling frequency, the supplier must collect samples no later than every third calendar year.

(D) If the supplier is required to monitor for water quality parameters, the supplier must comply with the water quality parameter requirements and the lead action level to qualify for a reduced lead and copper tap sampling frequency.

(I) If the supplier is on a reduced monitoring frequency for water quality parameters and an excursion occurs as specified in 11.26(4)(k), the supplier must begin collecting lead and copper tap samples at a six-month frequency at the number of sites specified in Table 11.26-IV.

(E) To determine if a reduced sampling frequency is appropriate, the Department will review sample results, treatment, and other relevant information submitted by the supplier.

(I) If the Department determines that a reduced sampling frequency is appropriate, the supplier will be notified in writing.

(a) The supplier is not required to obtain Department-approval to reduce the sampling frequency from six month to annually.

(II) When the supplier submits any data relevant to the number and frequency of tap sampling, the Department will review, and where appropriate, revise this determination.

(iv) If the supplier is on a reduced sampling frequency:

(A) The supplier must collect lead and copper tap samples at the number of sites specified in Table 11.26-IV from the sites identified in the sampling pool.

(I) The supplier must choose sites based on the tier category requirements specified in 11.26(2)(a)(iii-vi).

(II) The Department may specify the sites.

(B) The supplier must collect lead and copper tap samples during the monitoring period of June through September of the same calendar year.

(C) The Department may approve a monitoring period other than the months of June through September for collecting lead and copper tap samples under the following conditions:

(I) The supplier must collect lead and copper tap samples:

(a) During a monitoring period that is no longer than four consecutive months; and

(b) During a time when the highest levels of lead are most likely to occur during normal operations.

(II) If the supplier is on an annual sampling frequency, the supplier must collect lead and copper tap samples during a monitoring period that ends no later than 21 months after the previous round of sampling. Subsequent lead and copper tap samples must be collected annually.

(III) If the supplier is on a three-year sampling frequency, the supplier must collect lead and copper tap samples during a monitoring period that ends no later than 45 months after the previous round of sampling. Subsequent lead and copper tap samples must be collected no later than every third calendar year.

(IV) For non-transient, non-community water systems that do not operate during the months of June through September and the supplier does not know when, during the period of normal operation, the highest levels of lead are most likely to occur, the Department will determine a monitoring period that represents a time of normal operation. The supplier must begin sampling:

(a) If the supplier is on an annual sampling frequency, in the calendar year immediately following the end of the second consecutive six-month compliance period.

(b) If the supplier is on a three-year sampling frequency, during the three-year compliance period following the end of the third consecutive calendar year of sampling.

(D) The supplier must submit to the Department for approval any upcoming long-term change in treatment or the addition of a new source (e.g., installation of corrosion control or source water treatment) as specified in 11.26(8).

(I) The Department may modify sampling requirements in one of the following ways:

(a) Require the supplier to return to a six-month lead and copper tap sampling frequency and increase the number of sites as specified in Table 11.26-IV.

(b) Require the supplier to increase water quality parameter sampling or re-evaluate the effectiveness of the current corrosion control treatment.

(v) If the lead or copper action level is exceeded, the supplier must continue or begin a six-month sampling frequency and collect lead and copper tap samples from the number of sites specified in Table 11.26-IV.

(A) The supplier must begin sampling no later than the six-month compliance period beginning January 1 of the calendar year following the exceedance.

(B) The supplier may return to a reduced sampling frequency if the conditions specified in 11.26(2)(d)(iii) are satisfied and the supplier has received written Department approval.

(e) Small System Tap Sampling Waiver Requirements

(i) For small systems, the supplier may apply to the Department for a lead and/or copper tap sampling waiver. The Department may grant a waiver if the supplier demonstrates that all of the materials and sampling criteria specified in 11.26(2)(e)(i)(A-B) have been met. The supplier may apply for a full waiver from sampling for both lead and copper, or a partial waiver from sampling for either lead or copper.

(A) The materials criteria for a waiver are as follows:

(I) The supplier must demonstrate that the distribution system, service lines, all drinking water supply plumbing, and plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and/or copper-containing materials.

(II) For a lead tap sampling waiver, the supplier must submit certification and supporting documentation that the system is free of all lead-containing materials. To be free of all lead-containing materials means the system meets both of the following criteria:

(a) The system contains no plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers.

(b) The system contains no lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 United States Code (U.S.C.) 300g-6(e) (Plumbing fittings and fixtures) (Safe Drinking Water Act section 1417(e)).

(III) For a copper tap sampling waiver, the supplier must submit certification and supporting documentation that the system contains no copper pipes or copper service lines.

(B) The sampling criteria for a waiver are as follows:

(I) The supplier must have completed at least one six-month compliance period of sampling for lead and copper at Department-approved sites and at the number of sites specified in Table 11.26-IV.

(II) For all samples collected since the system became free of all lead-containing and/or copper-containing materials, the sample results must demonstrate that:

(a) The 90th percentile lead level is less than or equal to (≤) 0.005 mg/L; and/or

(b) The 90th percentile copper level is less than or equal to (≤) 0.65 mg/L.

(ii) The supplier must continue collecting lead and copper tap samples as specified in 11.26(2)(d) until the supplier receives written notification from the Department that the waiver has been approved.

(iii) The Department will notify the supplier in writing of the waiver determination and include the basis for the decision and any conditions of the waiver.

(A) As a condition of the waiver, the Department may require the supplier to perform specific activities (e.g., periodic outreach to customers to remind them to avoid installation of materials that might void the waiver) to avoid the risk of lead and copper levels of concern at the taps.

(iv) If the Department grants a full or partial waiver, the supplier must:

(A) Collect lead and/or copper tap samples for the waived contaminant(s) at least once every nine years, at the reduced number of sample sites specified in Table 11.26-IV.

(I) The supplier must collect tap samples no later than every ninth calendar year.

(II) The supplier must collect tap samples during the months of June through September or during an alternative Department-approved monitoring period as specified in 11.26(2)(d)(iv)(C).

(III) If the supplier is granted a partial waiver, the supplier must collect tap samples for the non-waived contaminant as specified in 11.26(2)(d).

(B) Submit the materials certification as specified in 11.26(2)(e)(i)(A)(II) each time the supplier submits sample results.

(C) Submit to the Department for approval any upcoming long-term change in treatment or the addition of a new source as specified in 11.26(8).

(I) The Department may modify waiver conditions if it determines that such modifications are necessary to address treatment or source water changes at the system.

(D) Notify the Department, in writing, no later than 60 days after the supplier becomes aware that the system is no longer free of lead-containing or copper-containing materials (e.g., as a result of new construction or repairs).

(I) The supplier must include information regarding the circumstances that resulted in the lead-containing and/or copper-containing materials being introduced into the system.

(II) The supplier must specify what corrective action, if any, will be taken for the removal of these materials.

(v) If the supplier continues to comply with the materials and sampling criteria as specified in 11.26(2)(e)(i)(A-B), the waiver will be renewed automatically.

(A) No later than nine years after the previous round of sampling is completed, the supplier must submit documentation to demonstrate that these criteria have been met.

(vi) If the supplier fails to meet the materials and sampling criteria as specified in 11.26(2)(e)(i)(A-B), the waiver will be revoked.

(A) The Department shall notify the supplier in writing that the waiver has been revoked and the basis for the decision.

(B) If the waiver is revoked, the supplier must comply with the lead and copper tap sampling requirements specified in 11.26(2)(d).

(C) If the waiver is revoked and both the lead and copper action levels have been met, the supplier must collect lead and copper tap samples no less frequently than once every three years at the reduced number of sample sites.

(vii) The supplier may re-apply for a waiver when the materials and sampling criteria are satisfied as specified in 11.26(2)(e)(i)(A-B).

(f) Invalidation of Lead and Copper Tap Samples

(i) The Department may invalidate a lead or copper tap sample based on one or more of the following conditions:

(A) The laboratory determines that improper sample analysis caused erroneous results.

(B) The Department determines that the sample was collected from a site that did not meet the site selection criteria specified in 11.26(2)(a).

(C) The sample container was damaged in transit.

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

(E) Sampling or analytical errors.

(ii) The supplier must report all lead and copper tap sample results along with all supporting documentation for the sample(s) that the supplier is requesting the Department to invalidate.

(A) If the supplier allows residents to collect the lead and copper tap samples, the supplier may not challenge, based on alleged errors in sample collection, the accuracy of the sample results.

(iii) The Department shall document in writing whether the sample was invalidated and the rationale for the decision.

(A) The Department shall not invalidate a sample based solely on the grounds that another sample collected at the same site has a result that is higher or lower than the original sample.

(iv) If the Department invalidates a sample, the result does not count toward determining the lead or copper 90^{th} percentile or toward meeting the minimum number of samples required as specified in 11.26(2)(d).

(v) If the Department invalidates a sample and there are too few samples remaining to meet the minimum sampling requirement, the supplier must collect replacement samples.

(A) The supplier must collect replacement samples as soon as possible but no later than 20 days after the date the Department invalidates the sample or by the end of the applicable monitoring period, whichever is later.

(I) If the supplier collects replacement samples after the end of the applicable monitoring period, the samples will only satisfy the sampling requirements of that monitoring period and must not be used to satisfy the sampling requirements of any other monitoring period.

(B) The supplier must collect replacement samples at the same site(s) as the invalidated sample(s) or, if that is not possible, at sites that were not being used for sampling during the applicable monitoring period.

(g) Consumer Notification of Lead Tap Sample Results

(i) For each sample site from which a sample was collected, the supplier must distribute a consumer notice to the people supplied at that sample site of the individual lead tap sample results (i.e., the occupants of the residence where the tap sample was collected).

(ii) The supplier must distribute the consumer notice as soon as possible but no later than 30 days after the supplier receives the tap sample results.

(iii) The supplier must include all of the following information in the consumer notice:

(A) The lead tap sample result(s) for the tap that was tested.

(B) The action level, MCLG, and the definitions for these terms.

(C) An explanation of the health effects of lead.

(D) A list of steps that the consumer can take to reduce exposure to lead in their drinking water.

(E) System contact information.

(iv) The supplier must distribute the consumer notice by mail or by another Department-approved method to the consumers at the sample sites that were sampled, including consumers who do not receive water bills.

(A) For non-transient non-community water systems, the Department may allow the supplier to post the lead tap sample results on a bulletin board to allow consumers to review the information.

(v) No later than three months after the end of the monitoring period, the supplier must submit a sample copy of the consumer notice along with a certification that the notice has been distributed as specified in this section, 11.26(2)(g).

(h) Reporting Requirements for Lead and Copper Tap Sample Results

(i) No later than the 10th of the month following the end of each monitoring period, the supplier must submit the all of the following:

(A) Lead and copper tap sample results, including the location of each site and the criteria for which the site was selected.

(I) If a site was sampled during the current monitoring period that was not sampled during previous monitoring periods, the supplier must submit an explanation for the change in sample site(s).

(B) The 90th percentile calculations for the lead and copper tap sample results.

(ii) The supplier is not required to report the 90th percentile lead and copper levels if all of the following conditions are met:

(A) The Department has notified the supplier that the Department will calculate the 90th percentile lead and copper levels based on the lead and copper tap sample results submitted. In the notification, the Department shall specify a date before the end of the monitoring period that the supplier must submit the lead and copper tap sample results.

(B) The supplier submits all of the following information by the Department-specified date:

(I) The results of all lead and copper tap samples.

(II) The location of each site.

(III) The tier level and criteria used to select the site.

(IV) A list of the sites that were sampled during the current monitoring period that were not sampled during previous monitoring periods, and an explanation for the change in sample sites.

(C) The Department has submitted the results of the 90th percentile lead and copper calculations, in writing, to the supplier before the end of the monitoring period.

11.26(3) Corrosion Control Requirements

(a) Criteria for Being Deemed to Have Optimal Corrosion Control

(i) For new systems or reclassified systems that now meet the applicability of this rule, the supplier must begin corrosion control treatment steps unless the system is deemed to have optimal corrosion control as specified in this section, 11.26(3)(a).

(A) If system is deemed to have optimal corrosion control and subsequently is no longer deemed to have optimal corrosion control as specified in 11.26(3)(b), the supplier must begin corrosion control treatment steps as specified in 11.26(3)(c).

(ii) The system shall be deemed to have optimal corrosion control if one of the following criteria is met:

(A) For small and medium systems, the lead and copper action levels have been met for two consecutive six-month compliance periods.

(B) The supplier demonstrates to the satisfaction of the Department that activities equivalent to the corrosion control treatment steps specified in 11.26(3)(c) have been conducted and the supplier is operating in compliance with the Department-specified water quality parameters as specified in 11.26(4)(j) to ensure that optimal corrosion control treatment is maintained.

(I) In order for the Department to make the determination to deem the system to have optimal corrosion control, the supplier must submit all of the following:

(a) The monitoring results for each of the water quality parameters collected under 11.26(3)(c)(iii)(C).

(b) A report explaining the test methods used to evaluate the corrosion control treatments as specified in 11.26(3)(c)(iii)(A), the results of all tests conducted, and the basis for the optimal corrosion control treatment selected by the supplier.

(c) A report explaining how corrosion control treatment was installed and how it is being maintained to ensure minimal lead and copper levels at consumers' taps.

(d) The results of lead and copper tap samples that were collected on a six-month frequency for at least one year after corrosion control treatment was installed.

(II) The Department shall notify the supplier in writing of the determination and basis for the decision.

(C) The system meets the copper action level and the supplier submits lead and copper tap samples and entry point samples that demonstrate during two consecutive six-month compliance periods that either:

(I) The difference between the 90th percentile lead level at the tap and the highest lead entry point sample result is less than (<) 0.005 mg/L; or

(II) The 90th percentile lead level is less than or equal (≤) 0.005 mg/L if the highest lead entry point sample result is less than (<) the method detection limit.

(D) The supplier has completed the optimal corrosion control treatment steps as specified in 11.26(3)(c) and:

(I) Continues to operate and maintain optimal corrosion control treatment as specified in 11.26(3)(d).

(II) Meets any Department-specified requirements that ensure optimal corrosion control treatment is maintained.

(iii) If the system is deemed to have optimal corrosion control based on the criteria specified in 11.26(3)(a)(ii)(C), the supplier must:

(A) Continue collecting lead and copper tap samples on a three-year sampling frequency as specified in 11.26(2)(d).

(B) Notify the Department, in writing, of any upcoming long-term change in treatment or the addition of a new source as specified in 11.26(8).

(I) The Department may require the supplier to conduct additional monitoring or to take other actions to ensure that minimal levels of corrosion in the distribution system are maintained.

(b) Requirements for a System that No Longer Meets the Criteria for Being Deemed to Have Optimal Corrosion Control

(i) If the system was deemed to have optimal corrosion control under 11.26(3)(a)(ii)(A) and subsequently has a lead or copper action level exceedance, the system is no longer deemed to have optimal corrosion control and the supplier must begin corrosion control treatment steps as specified in 11.26(3)(c).

(ii) If the system was deemed to have optimal corrosion control under 11.26(3)(a)(ii)(B) or 11.26(3)(a)(ii)(D) and subsequently has a lead action level exceedance, the supplier must begin lead service line replacement as specified in 11.26(6).

(iii) If the system was deemed to have optimal corrosion control under 11.26(3)(a)(ii)(C) and no longer meets that criteria, the system is no longer deemed to have optimal corrosion control and the supplier must begin corrosion control treatment steps as specified in 11.26(3)(c).

(iv) If the system was deemed to have optimal corrosion control under 11.26(3)(a)(ii)(A) and subsequently becomes a large system, the supplier must begin corrosion control treatment steps beginning with the requirement to complete a corrosion control study as specified in 11.26(3)(c)(iii) unless the system is deemed to have optimal corrosion control under 11.26(3)(a)(ii)(B) or 11.26(3)(a)(ii)(C).

(c) Corrosion Control Treatment Steps and Timelines

(i) No later than six months after the end of the monitoring period during which the lead or copper action level was exceeded, or no later than six months after the date the system is no longer deemed to have optimal corrosion control as specified in 11.26(3)(b), the supplier must recommend optimal corrosion control treatment.

(A) The supplier must recommend one or more of the corrosion control treatments specified in 11.26(3)(c)(iii)(A) that will most likely provide optimal corrosion control for the system.

(B) The Department may require the supplier to collect water quality parameter monitoring samples in addition to the requirements specified in 11.26(4)(c) and 11.26(4)(d), as applicable, to assist the Department in reviewing the recommendation.

(C) If the Department requests additional information to aid its review, the supplier must submit that information.

(ii) After reviewing the optimal corrosion control treatment recommendation, the Department shall make one of the following determinations:

(A) Approve the corrosion control treatment recommendation submitted by the supplier or the Department shall specify corrosion control treatment(s) from those listed in 11.26(3)(c)(iii)(A). The Department shall specify optimal corrosion control treatment according to the following timeframes:

(I) For medium and large systems, no later than 18 months after the end of the monitoring period during which the lead or copper action level was exceeded.

(II) For small systems, no later than 24 months after the end of the monitoring period during which the lead or copper action level was exceeded.

(B) Require the supplier to perform corrosion control studies as specified in 11.26(3)(c)(iii).

(I) If the Department makes this determination, the Department shall notify the supplier no later than 12 months after the end of the monitoring period during which the lead or copper action level was exceeded.

(II) If required to perform corrosion control studies, the supplier must complete the corrosion control studies no later than 18 months after the Department makes this determination.

(III) The Department shall specify optimal corrosion control treatment no later than six months after the studies are completed.

(iii) Corrosion control studies must include:

(A) An evaluation of the effectiveness of the following corrosion control treatments, separately or in combination, that the supplier will use to determine the optimal corrosion control treatment for the system:

(I) Alkalinity and pH adjustment.

(II) Calcium hardness adjustment.

(III) The addition of a phosphate or silicate based corrosion inhibitor at a concentration sufficient to maintain an effective corrosion inhibitor residual concentration throughout the distribution system.

(a) "EFFECTIVE CORROSION INHIBITOR RESIDUAL" means a concentration sufficient to form a passivating film on the interior walls of a pipe.

(B) An analysis of each of the corrosion control treatments by either:

(I) Evaluating documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration; or

(II) Evaluating the effectiveness of each corrosion control treatment using one of the following methods:

(a) Pipe rig/loop tests.

(b) Metal coupon tests.

(c) Partial-system tests.

(C) Monitoring of the following water quality parameters before and after any test under 11.26(3)(c)(iii)(B)(II) used to evaluate the effectiveness of the corrosion control treatment(s):

(I) Lead.

(II) Copper.

(III) pH.

(IV) Alkalinity.

(V) Water temperature.

(VI) Calcium.

(VII) Conductivity.

(VIII) Silicate, if an inhibitor containing a silicate compound is used.

(IX) Orthophosphate, if an inhibitor containing a phosphate compound is used.

(D) An identification of all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment. The supplier must document the constraints with data and documentation demonstrating one or more of the following:

(I) A particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics.

(II) That the supplier 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.

(E) An evaluation of the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(F) A recommendation of the treatment option that provides optimal corrosion control treatment for the system based on the information obtained during the studies.

(I) The supplier must submit a rationale for the recommendation and include all supporting documentation collected under 11.26(3)(c)(iii)(A-E).

(iv) When designating optimal corrosion control or approving the optimal corrosion control treatment recommendation submitted by the supplier, the Department shall consider the effects that additional corrosion control treatment will have on water quality parameters and other water quality treatment processes.

(v) The Department shall notify the supplier, in writing, of the decision on optimal corrosion control treatment and explain the basis for this determination.

(vi) No later than 24 months after the Department approves optimal corrosion control treatment, the supplier must:

(A) Properly install and operate that treatment; and

(B) Submit certification that the Department-approved optimal corrosion control treatment was installed.

(vii) For two consecutive six-month compliance periods, beginning with the compliance period in which optimal corrosion control treatment was installed, the supplier must:

(A) Monitor water quality parameters as specified in 11.26(4)(e); and

(B) Collect lead and copper tap samples as specified in 11.26(2)(a).

(viii) No later than six months after the supplier completes water quality parameter monitoring and collects the lead and copper tap samples as specified in 11.26(3)(c)(vii), the Department shall determine if optimal corrosion control treatment was properly installed and operated and specify the optimal water quality parameters for corrosion control.

(A) After reviewing the water quality parameter monitoring results and lead and copper tap sample results collected before and after the installation of optimal corrosion control treatment, the Department shall specify:

(I) A minimum value or a range of values for pH that the supplier must maintain at each entry point.

(II) A minimum value for pH that the supplier must maintain throughout the distribution system.

(a) This value must be greater than or equal to (≥) 7.0, unless the Department determines that meeting a pH level of 7.0 is not technologically feasible or is not necessary for optimal corrosion control.

(III) If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor that the supplier must maintain to provide an effective corrosion inhibitor residual at each entry point and throughout the distribution system.

(IV) If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity that the supplier must maintain at each entry point and throughout the distribution system.

(V) If calcium carbonate stabilization is used as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for calcium that the supplier must maintain throughout the distribution system.

(B) If needed to reflect optimal corrosion control, the Department may specify the values for additional optimal water quality parameters.

(C) The Department shall notify the supplier, in writing, of the Department-specified optimal water quality parameters and the basis for the decision.

(ix) For small and medium systems, the supplier may discontinue completing the corrosion control treatment steps specified in this section, 11.26(3)(c), if the system meets the lead and copper action levels during two consecutive six-month compliance periods.

(A) If the lead or copper action level is subsequently exceeded, the supplier must complete the applicable corrosion control treatment steps beginning with the first step that was not previously completed.

(B) The Department may require the supplier to repeat previously completed corrosion control treatment steps if the Department determines it is necessary to properly implement the requirements in this section, 11.26(3)(c).

(d) Requirements for the Continued Operation and Maintenance of Optimal Corrosion Control Treatment

(i) If the supplier was required to install optimal corrosion control treatment, the supplier must operate and maintain the optimal corrosion control treatment.

(ii) To demonstrate the continued operation and maintenance of optimal corrosion control treatment, the supplier must comply with the treatment technique requirements for water quality parameters as specified in 11.26(4)(j) and collect lead and copper tap samples as specified in 11.26(2)(d).

(A) The supplier must begin monitoring water quality parameters on the date that the Department notifies the supplier of the Department-specified optimal values for corrosion control.

(iii) To ensure optimal corrosion control, the Department may modify the determination of optimal corrosion control treatment or optimal water quality parameters.

(A) The supplier, or other interested party, may request in writing that the Department modify optimal corrosion control treatment or optimal water quality parameters. The request must explain why the modification is appropriate and include supporting documentation.

(B) If the Department modifies the determination, the Department shall notify the supplier in writing of the modified treatment requirements and include all of the following information:

(I) The basis for the decision.

(II) An implementation schedule for the supplier to complete the modified treatment requirements.

(e) Treatment Technique Violations and Response for Optimal Corrosion Control

(i) If the supplier fails to install optimal corrosion control treatment as specified in 11.26(3)(c)(vi), an optimal corrosion control treatment technique violation occurs.

(ii) In the event of an optimal corrosion control treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

11.26(4) Monitoring Requirements for Water Quality Parameters

(a) Applicability

(i) For large systems, the supplier must comply with the water quality parameter requirements specified in this section, 11.26(4).

(ii) For small and medium systems, if the lead or copper action level is exceeded, the supplier must comply with the water quality parameter requirements specified in this section, 11.26(4).

(b) General Monitoring Requirements for Water Quality Parameters

(i) The supplier must monitor for water quality parameters at taps and at each entry point.

(A) The supplier must collect tap samples that are representative of water quality throughout the distribution system taking into account the number of individuals served, the different sources of water, the different treatment methods employed by the system, and seasonal variability.

(I) Tap samples for water quality parameters are not required to be collected at the lead and copper tap sampling sites specified in 11.26(2)(a).

(B) The supplier must collect tap samples from the number of sites specified in Table 11.26-V based on the required monitoring frequency.

TABLE 11.26-V NUMBER OF WATER QUALITY PARAMETER TAP SAMPLE SITES

Population supplied	Number of sites for water quality parameters	
	Routine	Reduced
Greater than (>) 100,000	25	10
10,001-100,000	10	7
3,301 to 10,000	3	The number of sites may not be reduced.
501 to 3,300	2	
101 to 500	1	
Less than or equal to (≤) 100	1	

(c) For Systems that Become a Large System - Initial Monitoring Requirements for Water Quality Parameters

(i) For systems that become a large system, the supplier must monitor water quality parameters during two consecutive six-month compliance periods. In each six-month compliance period, the supplier must:

(A) Monitor the following water quality parameters:

(I) pH.

(II) Alkalinity.

(III) Water temperature.

(IV) Calcium.

(V) Conductivity.

(VI) Silica, if an inhibitor containing a silicate compound is used.

(VII) Orthophosphate, if an inhibitor containing a phosphate compound is used.

(B) At the routine number of sites specified in Table 11.26-V, collect two samples for each applicable water quality parameter.

(C) At each entry point, collect two samples for each applicable water quality parameter.

(d) For Small and Medium Systems - Monitoring Requirements for Water Quality Parameters After an Action Level Exceedance

(i) In each monitoring period that the lead or copper action level is exceeded, the supplier must:

(A) Monitor the following water quality parameters:

(I) pH.

(II) Alkalinity.

(III) Water temperature.

(IV) Calcium.

(V) Conductivity.

(VI) Silica, if an inhibitor containing a silicate compound is used.

(VII) Orthophosphate, if an inhibitor containing a phosphate compound is used.

(B) At the routine number of sites specified in Table 11.26-V, collect two samples for each applicable water quality parameter.

(C) At each entry point, collect two samples for each applicable water quality parameter.

(e) Initial Monitoring Requirements for Water Quality Parameters After the Installation of Corrosion Control Treatment

(i) The supplier must monitor water quality parameters during two consecutive six-month compliance periods immediately following the installation of optimal corrosion control treatment as specified in 11.26(3)(c)(vii). In each six-month compliance period, the supplier must:

(A) At the routine number of sites specified in Table 11.26-V, collect two samples for each of the following:

(I) pH.

(II) Alkalinity.

(III) Calcium, if calcium carbonate stabilization is used as part of corrosion control.

(IV) Silica, if an inhibitor containing a silicate compound is used.

(V) Orthophosphate, if an inhibitor containing a phosphate compound is used.

(B) At each entry point, collect at least one sample every other week for each of the following:

(I) pH.

(II) If 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.

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

(C) For groundwater systems, the supplier may reduce entry point sampling to entry points that are representative of water quality and treatment conditions throughout the system.

(I) If water from untreated groundwater sources mixes with water from treated groundwater sources, the supplier must monitor for water quality parameters at representative entry points receiving treatment and at representative entry points not receiving treatment.

(II) Before starting reduced entry point monitoring, the supplier must submit documentation identifying the selected representative entry points and information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system, including information on seasonal variability.

(f) <u>For Large Systems – Routine Monitoring Requirements After the Department Specifies Water Quality Parameters for Optimal Corrosion Control</u>

(i) After the Department specifies the values for the applicable water quality parameters that reflect optimal corrosion control as specified in 11.26(3)(c)(viii), the supplier must monitor water quality parameters every six months as specified in 11.26(4)(e)(i)(A-C).

(A) After the Department specifies the values reflecting optimal corrosion control, the supplier must begin monitoring in the first six-month compliance period, beginning either January 1 or July 1, whichever comes first.

(g) <u>For Small and Medium Systems – Routine Monitoring Requirements After the Department Specifies Water Quality Parameters for Optimal Corrosion Control</u>

(i) After the Department specifies the values for the applicable water quality parameters that reflect optimal corrosion control as specified in 11.26(3)(c)(viii), the supplier must monitor water quality parameters during each six-month compliance period in which the lead or copper action level is exceeded.

(A) The supplier must monitor the water quality parameters as specified in 11.26(4)(e)(i)(A-C).

(B) If the supplier is collecting lead and copper tap samples on a reduced frequency at the time of the action level exceedance, the supplier must begin monitoring for water quality parameters no later than the six-month compliance period beginning January 1 of the calendar year following the action level exceedance.

(ii) The Department may require the supplier to routinely monitor water quality parameters to demonstrate the continued operation and maintenance of optimal corrosion control.

(A) If the Department requires routine monitoring, the supplier must monitor for water quality parameters during each six-month compliance period as specified in 11.26(4)(e).

(h) Reduced Monitoring Requirements for Water Quality Parameters at the Taps

(i) If the supplier has maintained the Department-specified values for the water quality parameters reflecting optimal corrosion control treatment as specified in 11.26(4)(j) for two consecutive six-month compliance periods, the supplier may, at the reduced number of sites specified in Table 11.26-V, collect two samples for each applicable water quality parameter during each six-month compliance period.

(ii) For large systems, and for small and medium systems for which the Department has required the supplier to routinely monitor water quality parameters as specified in 11.26(4)(g)(ii), the supplier may be eligible for a reduced tap monitoring frequency.

(A) If the supplier has maintained the Department-specified values for the water quality parameters reflecting optimal corrosion control treatment for three consecutive years of six-month monitoring, the supplier may reduce the tap monitoring frequency from every six months to annually.

(I) The supplier must collect two samples at each of the reduced number of sites specified in Table 11.26-V annually.

(II) The supplier must begin annual monitoring in the calendar year immediately following the end of the third consecutive year of six-month monitoring.

(III) The supplier must collect tap samples evenly throughout the year to reflect seasonal variability.

(B) If the supplier has maintained the Department-specified values for water quality parameters reflecting optimal corrosion control treatment for three consecutive years of annual monitoring, the supplier may reduce the tap monitoring frequency from annually to every three years.

(I) The three-year tap monitoring frequency must begin no later than the third calendar year after the end of the third consecutive year of annual monitoring.

(C) The supplier may reduce the tap monitoring frequency from every six months to every three years if, during two consecutive six-month compliance periods, all of the following criteria are met:

(I) The 90th percentile lead level is less than or equal to (≤) 0.005 mg/L.

(II) The 90th percentile copper level is less than or equal to (0.65 mg/L.

(III) The Department-specified values for the water quality parameters reflecting optimal corrosion control treatment have been maintained.

(iii) If the supplier is on a three-year sampling frequency, the supplier must collect samples no later than every third calendar year.

(iv) Reduced tap monitoring for water quality parameters does not change the requirement to monitor for water quality parameters at the entry point as specified in 11.26(4)(e)(i)(B-C).

(i) Increased Monitoring Requirements for Water Quality Parameters

(i) If the supplier is monitoring water quality parameters at a reduced frequency, the supplier must increase the water quality parameter tap monitoring frequency and increase the number of sites as specified in 11.26(4)(f) or 11.26(4)(g) if one or more of the following occur:

(A) A lead action level exceedance occurs.

(B) An excursion occurs as specified in 11.26(4)(k).

(ii) The supplier may return to a reduced water quality parameter tap monitoring frequency and reduce the number of sites if the conditions specified in 11.26(4)(h) are satisfied.

(j) Treatment Technique Compliance Determination for Continued Operation and Maintenance of Optimal Corrosion Control Treatment

(i) The supplier must maintain the Department-specified values for water quality parameters to demonstrate the continued operation and maintenance of optimal corrosion control treatment.

(ii) Compliance with monitoring requirements and Department-specified values for water quality parameters is determined for each six-month compliance period.

(iii) The results of all water quality parameter monitoring samples collected in addition to the minimum requirements specified in this section, 11.26(4), must be considered by the supplier and the Department in making any determinations (e.g., determining concentrations of water quality parameters).

(iv) The supplier must calculate the daily value for each water quality parameter at each sampling location as follows:

(A) On days when more than one sample for a water quality parameter is collected at a sampling location, the daily value is the average of all sample results collected on that day through continuous monitoring and/or grab sampling.

(B) On days when only one sample for a water quality parameter is collected at a sampling location, the daily value is that sample result.

(C) On days when no sample is collected for a water quality parameter at a sampling location, the daily value is the daily value calculated on the most recent day on which the water quality parameter was sampled.

(D) The Department may exclude sample results from this calculation due to sampling or analytical errors when appropriate.

(k) Treatment Technique Violations for Water Quality Parameters

(i) If an excursion occurs for any Department-specified water quality parameter, or combination of water quality parameters, at any sampling location, or combination of sampling locations, on more than a total of nine days during any six-month compliance period, a treatment technique violation occurs.

(A) "EXCURSION" means the daily value calculated for a water quality parameter at a sampling location is less than (<) the minimum value or outside the Department-specified range of values.

(l) Response to a Treatment Technique Violation for Water Quality Parameters

(i) In the event of a treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(C) Begin lead and copper tap sampling every six months at the number of sites specified in Table 11.26-IV no later than the six-month compliance period beginning January 1 of the calendar year following the violation.

(D) Monitor water quality parameters as specified in 11.26(4)(f) or 11.26(4)(g).

11.26(5) Sampling and Treatment Requirements for Lead and Copper in the Source Water

(a) Applicability

If the lead or copper action level is exceeded, the supplier must comply with the requirements for lead and copper entry point sampling and if necessary, the installation of additional treatment as specified in this section, 11.26(5).

(b) Sampling and Treatment Requirements After Exceeding the Lead or Copper Action Level

(i) No later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded, the supplier must:

(A) Collect one lead and copper sample from each entry point.

(B) Submit a written recommendation for the installation and operation of one of the source water treatments specified in 11.26(5)(b)(ii)(B)(II)(a-d).

(I) The supplier may recommend that treatment is not necessary based on the demonstration that source water treatment will not minimize lead and copper levels at the taps.

(ii) No later than six months after the supplier submits the lead and copper entry point sample results, the Department shall determine if additional treatment for lead and copper in the source water is necessary to minimize lead and copper levels at the taps based on an evaluation of the sample results submitted by the supplier.

(A) If the Department requests additional information to make the determination, the supplier must submit that information no later than the date specified in the request.

(B) If the Department determines that additional treatment is necessary for lead and copper in the source water, the Department shall require the supplier to either:

(I) Install and operate the supplier-recommended treatment; or

(II) Install and operate one of the following treatments:

(a) Ion exchange.

(b) Reverse osmosis.

(c) Lime softening.

(d) Coagulation and filtration.

(C) The Department shall notify the supplier in writing of the determination and basis for the decision.

(c) Installation of Additional Treatment for Lead and Copper in the Source Water

(i) No later than 24 months after the Department determines that additional treatment is necessary for lead and copper in the source water, the supplier must:

(A) Properly install and operate the Department-approved treatment.

(B) Submit certification that the Department-approved treatment was installed.

(ii) No later than 12 months after the installation of additional treatment for lead and copper in the source water, the supplier must collect samples in each of two consecutive six-month compliance periods as follows:

(A) One lead and copper sample at each entry point.

(B) Lead and copper tap samples at the number of sites specified in Table 11.26-IV.

(d) Treatment Technique Requirements After the Department Specifies Maximum Permissible Levels for Lead and Copper at the Entry Point

(i) No later than six months after the supplier collects lead and copper entry point samples, the Department shall review the sample results that were collected before and after the installation of treatment and determine if the treatment was properly installed and operated.

(A) Using this information, the Department shall specify maximum permissible levels that the supplier must comply with for lead and copper at each entry point that reflect the contaminant removal capability of the treatment when it is properly operated and maintained.

(B) The Department shall notify the supplier, in writing, and explain the basis for the decision.

(ii) Upon its own initiative or in response to a request, the Department may modify the treatment requirements or maximum permissible levels if it determines that the change is necessary to ensure that the lead and copper levels at the entry point are minimized.

(A) The supplier, or other interested party, may request in writing that the Department modify treatment or maximum permissible levels. The request must explain why the modification is appropriate and must include supporting documentation.

(B) The Department shall notify the supplier, in writing, of the modified treatment requirements or maximum permissible levels and include all of the following information:

(I) The basis for the decision.

(II) An implementation schedule for the supplier to complete the modifications.

(e) Routine Sampling Frequency for Lead and Copper at the Entry Point

(i) After the Department specifies the maximum permissible levels or determines that additional treatment for lead and copper in source water is not necessary, the supplier must collect lead and copper samples at each entry point as follows:

(A) For groundwater systems, once every three calendar years.

(I) The supplier must collect samples no later than every third calendar year.

(B) For surface water systems, annually.

(I) The first sample must be collected in the same calendar year that the Department specifies the maximum permissible levels.

(C) If the lead and copper tap sample results are less than or equal to (≤) the action level during any lead and copper entry point monitoring period, the supplier is not required to collect lead and copper entry point samples.

(ii) If a sample was collected at an entry point during the current monitoring period that was not sampled during previous monitoring periods, the supplier must submit an explanation for the change in entry point(s).

(f) Reduced Sampling Frequency for Lead and Copper at the Entry Point

(i) The supplier may reduce the sampling frequency for lead and copper entry point samples to once during each nine-year compliance cycle if:

(A) For groundwater systems, either:

(I) The supplier demonstrates that lead and copper entry point sample results have been less than (<) the maximum permissible levels specified by the Department for at least three consecutive three-year compliance periods; or

(II) The Department determines that additional treatment for lead and copper in source water is not needed and the supplier demonstrates that for at least three consecutive three-year compliance periods, the concentration of lead in the source water was less than or equal to (≤) 0.005 mg/L and the concentration of copper in the source water was less than or equal to (≤) 0.65 mg/L.

(B) For surface water systems, either:

(I) The supplier demonstrates that source water entry point sample results have been less than (<) the maximum permissible levels specified by the Department for at least three consecutive years; or

(II) The Department determines that additional treatment for lead and copper in source water is not needed and the supplier demonstrates that for at least three consecutive years, the concentration of lead in the source water was less than or equal to (0.005 mg/L and the concentration of copper in the source water was less than or equal to (0.65 mg/L.

(ii) If the supplier is on a nine-year sampling frequency, the supplier must collect samples no later than every ninth calendar year.

(iii) For new sources, the supplier is not eligible for a reduced sampling frequency for lead and copper at the entry point until the results collected from the new source during three consecutive monitoring periods are less than (<) the Department-specified maximum permissible levels.

(iv) If a sample was collected at an entry point during the current monitoring period that was not sampled during previous monitoring periods, the supplier must submit an explanation for the change in entry point(s).

(g) Response to an Exceedance of Maximum Permissible Levels

If any maximum permissible level is exceeded at an entry point, the Department may require the supplier to collect a confirmation lead and copper entry point sample as soon as possible but no later than two weeks after the initial entry point sample was collected.

(h) Compliance Determination for Lead and Copper in Source Water

(i) If a confirmation sample is collected, the supplier must average the results of the initial and confirmation samples to determine compliance with the maximum permissible level(s).

(ii) If a confirmation sample is not collected, compliance is determined based the individual sample result.

(iii) If a sample result is less than (<) the method detection limit, the sample result will be given a value of zero when calculating compliance.

(iv) If a sample result is greater than (>) the method detection limit but less than (<) 0.005 mg/L for lead or 0.050 mg/L for copper, when calculating compliance the supplier must use:

(A) For lead, the measured result or 0.0025mg/L.

(B) For copper, the measured result or 0.025 mg/L.

(i) Treatment Technique Violations for Lead and Copper in Source Water

(i) The following constitute lead and copper in source water treatment technique violations:

(A) A confirmation sample is collected and the average of the initial sample result and its confirmation sample result is greater than (>) the maximum permissible level(s) for lead and/or copper.

(B) A confirmation sample is not collected and the individual sample result is greater than (>) the maximum permissible level(s) for lead and/or copper.

(C) The supplier fails to install Department-approved treatment.

(j) Response to Treatment Technique Violations for Lead and Copper in Source Water

(i) In the event of a lead and copper in source water treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs.

(B) Distribute Tier 2 public notice as specified in 11.33.

(C) In the event of a treatment technique violation for exceeding the maximum permissible level(s), the Department may require the supplier to make changes to the treatment.

11.26(6) Lead Service Line Replacement Requirements

(a) Applicability

(i) If the lead action level is exceeded after corrosion control and/or source water treatment has been installed, the supplier must begin lead service line replacement as specified in this section, 11.26(6).

(ii) If the supplier received a violation for failure to install corrosion control and/or source water treatment, the Department may require the supplier to begin lead service line replacement as specified in this section, 11.26(6), after the date the supplier would have been required to complete follow-up lead and copper tap sampling after the installation of corrosion control as specified in 11.26(3)(c)(vii) and/or source water treatment as specified in 11.26(5)(c)(ii).

(b) Requirements for Lead Service Line Replacement

(i) The supplier must replace at least seven percent of the initial number of lead service lines in its distribution system each year based on a 15-year replacement program. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins.

(A) The supplier must use the information collected in the materials evaluation conducted under 11.26(2)(a)(i) and relevant legal authorities to identify the initial number of lead service lines and the portions of the lead service lines owned by the supplier.

(B) If the lead levels in all service line samples collected from an individual lead service line are less than or equal to (≤) 0.015 mg/L, the supplier is not required to replace that individual lead service line.

(I) If the supplier collects lead service line samples, each sample must be one liter in volume and have stood motionless in the lead service line for at least six hours. The supplier must collect lead service line samples in one of the following ways:

(a) At the tap, after flushing the volume of water between the tap and the lead service line.

(b) Tapping directly into the lead service line.

(c) 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 that would indicate that the water was standing in the lead service line.

(II) The supplier may include lead service lines that meet this criterion in the seven percent of initial lead service lines that are required to be replaced. These lines are considered to have tested out of having to be replaced.

(C) The first year of the lead service line replacement program must begin on the first day after the end of the monitoring period in which lead service line replacement was triggered.

(ii) Based on the number of lead service lines in the distribution system, the Department shall require a shorter replacement schedule and that more than seven percent of the lead service lines be replaced each year. The Department shall notify the supplier, in writing, of the shorter replacement schedule no later than six months after the end of the monitoring period in which lead service line replacement was triggered.

(iii) The supplier must replace the portions of the lead service lines that the supplier owns.

(A) If the supplier does not own the entire lead service line, the supplier must notify the owner of the line, or the owner's authorized agent, that the supplier will replace the portion of the service line owned by the supplier and must offer to replace the privately-owned portion of the line.

(I) For privately-owned portions of the lead service line, the supplier is not required to:

(a) Pay to replace the privately-owned portion of the line;

(b) Replace the privately-owned portion if the owner chooses not to pay to replace the privately-owned portion of the line; or

(c) Replace the privately-owned portion if doing so would be precluded by law.

(iv) If the entire lead service line is not replaced, the supplier must:

(A) Distribute notification to the residents of all buildings supplied by the lead service line at least 45 days before beginning the partial lead service line replacement. The notification must include all of the following information:

(I) That the residents may experience a temporary increase of lead levels in their drinking water.

(II) Guidance on measures the residents can take to minimize their exposure to lead.

(III) That the supplier will collect and have analyzed, at the supplier's expense, a lead service line sample from each partially-replaced lead service line no later than 72 hours after the completion of the partial lead service line replacement.

(B) If the partial lead service line replacement is in conjunction with emergency repairs, the Department may allow the supplier to distribute the notification in less than 45 days but before beginning the partial lead service line replacement.

(C) For single-family residences supplied by the lead service line, distribute the notification by mail or by other Department-approved methods.

(D) For multiple-family residences supplied by the lead service line, distribute the notification by mail or by other Department-approved methods or post the notification in a conspicuous location.

(E) Collect lead service line samples as specified in 11.26(6)(b)(i)(B)(I) no later than 72 hours after the completion of the partial lead service line replacement.

(I) The supplier must report the lead service line sample results to the owner and the residents supplied by the line no later than three business days after receiving the results.

(a) If the sample results are mailed, the mailings must be post-marked no later than three business days after the supplier received the results.

(v) If the 90th percentile of the lead tap sample results collected under 11.26(2)(d) is less than or equal to (≤) the lead action level for two consecutive monitoring periods, the supplier may discontinue replacing lead service lines.

(A) If the lead action level is subsequently exceeded, the supplier must resume lead service line replacement.

(B) If required to resume lead service line replacement, the supplier must:

(I) Update the inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision specified in 11.26(6)(b)(i)(B);

(II) Divide the updated number of remaining lead service lines by the number of years remaining in the replacement program to determine the number of lines that must be replaced each year; and

(III) Comply with a Department-determined schedule for replacing or re-testing lead service lines that were previously tested out if the supplier has completed a 15-year lead service line replacement program.

(c) Reporting Requirements for Lead Service Line Replacement

(i) No later than 12 months after the end of the monitoring period in which lead service line replacement was triggered, the supplier must submit all of the following information:

(A) The materials evaluation conducted under 11.26(2)(a)(i).

(B) The initial number of lead service lines in the distribution system identified under 11.26(6)(b).

(C) The schedule for replacing at least seven percent of the initial number of lead service lines in the distribution system each year.

(ii) No later than 12 months after the end of the monitoring period in which lead service line replacement was triggered, and every 12 months thereafter, the supplier must submit:

(A) The number of lead service lines scheduled to be replaced during the previous year of the replacement schedule.

(B) Documentation that at least seven percent, or the Department-specified percentage, of the initial lead service lines were replaced in the previous 12 months.

(I) The supplier must include the number and location of each lead service line that was replaced during the previous year of the replacement schedule.

(II) If a lead service line(s) has tested out of replacement as specified in 11.26(6)(b)(i)(B), the supplier must submit the sample results from those tests.

(C) If collected, the lead service line sample results, the sampling method, and the date the samples were collected.

(iii) To verify that all partial lead service line replacement activities were completed, the supplier must submit any additional information required by the Department, in a time and manner specified by the Department.

(A) The supplier is not required to submit the sample results of the lead service line samples collected after partial lead service line replacement if the Department has determined that reporting these sample results is not necessary.

(d) Treatment Technique Violations for Lead Service Line Replacement

(i) The following constitute lead service line replacement treatment technique violations:

(A) Failure to replace the required percentage of lead service lines each year.

(B) Failure to comply with the reporting requirements specified in 11.26(6)(c) to demonstrate that the replacement requirements have been met.

(C) Failure to distribute notification to the residents of all buildings supplied by the lead service line at least 45 days before beginning the partial lead service line replacement as specified in 11.26(6)(b)(iv).

(D) Failure to collect and have analyzed a lead sample from each partially-replaced lead service line no later than 72 hours after the completion of the partial lead service line replacement as specified in 11.26(6)(b)(iv)(E).

(E) Failure to report the lead service line sample results to the owner and the residents supplied by the line no later than three business days after receiving the results as specified in 11.26(6)(b)(iv)(E)(I).

(e) Response to Treatment Technique Violations for Lead Service Line Replacement

(i) In the event of a treatment technique violation for lead service line replacement, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs; and

(B) Distribute Tier 2 public notice as specified in 11.33.

11.26(7) Public Education Requirements

(a) Applicability

If the lead action level is exceeded, the supplier must comply with the public education requirements as specified in this section, 11.26(7).

(b) Content of Public Education Materials

(i) The supplier must include the following information in printed materials (e.g., brochures and pamphlets) in the same order as follows:

(A) IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [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.

(B) “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.”

(C) Include information on the sources of lead:

(I) Explain what lead is.

(II) Explain possible sources of lead in drinking water and how lead enters drinking water. Include information on home/building plumbing materials and service lines that may contain lead.

(III) Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(D) Discuss the steps the consumer can take to reduce their exposure to lead in drinking water.

(I) Encourage running the water to flush out the lead.

(II) Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.

(III) Explain that boiling water does not reduce lead levels.

(IV) Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

(V) Suggest that parents consult a medical professional for advice about whether to have their child's blood tested for lead.

(E) Explain why there are elevated levels of lead in the system's drinking water, if known, and what the supplier is doing to reduce the levels in homes or buildings in this area.

(F) For more information call us at [THE WATER SYSTEM'S NUMBER] [(IF APPLICABLE), visit our website at [THE WATER SYSTEM'S WEBSITE HERE]]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA's website at http://www.epa.gov/lead or contact your health care provider.

(ii) In the printed materials, the supplier must:

(A) Include the language exactly as written and provide the specific information for the text in brackets for 11.26(7)(b)(i)(A), 11.26(7)(b)(i)(B), and 11.26(7)(b)(i)(F).

(B) Provide the information for the requirements specified in 11.26(7)(b)(i)(C-E).

(iii) For community water systems, the supplier must also include all of the following information:

(A) How consumers can get their water tested.

(B) A discussion of lead in plumbing components and the difference between low lead and lead free.

(iv) If the supplier includes additional information, it must be consistent with the information specified in 11.26(7)(b)(i) and be in plain language that can be understood by the general public.

(v) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, the supplier must include either:

(A) Information in the appropriate language(s) regarding the importance of the notice; or

(B) A telephone number or address where the consumer may contact the supplier to obtain a translated copy of the public education materials or request assistance in the appropriate language.

(vi) The supplier must offer to sample the tap water of any customer who requests it. The supplier is not required to pay for collecting or analyzing the sample, nor is the supplier required to collect and analyze the sample.

(c) Distribution of Public Education Materials for Community Water Systems

(i) For community water systems, the supplier must distribute public education materials as specified in this section, 11.26(7)(c). The public education materials distributed must meet the requirements specified in 11.26(7)(b).

(ii) No later than 60 days after the end of the monitoring period in which the lead action level exceedance occurs, the supplier must:

(A) Distribute public education materials to all bill paying customers.

(B) Distribute public education materials to local public health agencies even if they are not located in the system's service area.

(I) The supplier must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community based organizations serving target populations, which may include organizations outside the service area of the system.

(a) If such a list is provided, the supplier must distribute public education materials to all organizations on the provided list.

(C) Distribute public education materials to all of the following organizations located in the system's service area:

(I) Public and private schools and school boards.

(II) Women, Infants and Children (WIC) and Head Start programs.

(III) Public and private hospitals and medical clinics.

(IV) Pediatricians.

(V) Family planning clinics.

(VI) Local welfare agencies.

(D) Make a good faith effort to locate the following organizations in the system's service area and distribute public education materials to them. The good faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located in the system's service area.

(I) Licensed childcare centers.

(II) Public and private preschools.

(III) Obstetricians-Gynecologists and midwives.

(E) Include an informational notice in the materials distributed to the organizations specified in 11.26(7)(c)(ii)(B-D) that encourages the distribution of the public education materials to all of the potentially affected customers or users of the organizations.

(F) In addition to distributing public education materials as specified above, complete at least three activities from one or more of the following categories. The content and selection of these methods must be determined in consultation with the Department.

(I) Public service announcements.

(II) Paid advertisements.

(III) Public area informational displays.

(IV) E-mails to customers.

(V) Public meetings.

(VI) Household deliveries.

(VII) Targeted individual customer contact.

(VIII) Direct material distribution to all multi-family homes and institutions.

(IX) Other Department-approved methods.

(G) Begin including a statement on or in each water bill no less frequently than quarterly.

(I) The water bill must include the following statement exactly as written and provide the specific information for the text in brackets:

[NAME OF WATER SYSTEM] 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 WATER SYSTEM] [or visit (INSERT YOUR WEB SITE HERE)].

(II) The statement or distribution method can be modified in consultation with the Department. The Department may allow a separate mailing of public education materials to customers if the supplier cannot place the information on water bills.

(H) Submit a press release to newspaper, television, and radio stations.

(I) For systems supplying greater than (>) 100,000 people, post public education materials on the system's public website.

(iii) If needed for implementation purposes, the Department may extend the 60-day deadline for the requirements specified in 11.26(7)(c)(ii), on a case-by-case basis, only if the extension is approved in writing before the deadline.

(iv) For as long as the system exceeds the lead action level, the supplier must continue to distribute public education materials as follows:

(A) The supplier must repeat the tasks as specified in 11.26(7)(c)(ii)(A-F) every 12 months.

(B) The supplier must repeat the tasks as specified in 11.26(7)(c)(ii)(G) with each water bill, but no less frequently than quarterly, for as long as the system exceeds the lead action level.

(C) For systems supplying greater than (>) 100,000 people, the supplier must post and retain public education materials on the system's public website.

(D) The supplier must submit a press release to newspaper, television, and radio stations twice every 12 months on a Department-approved schedule.

(v) The supplier may apply to the Department in writing to omit the information specified in 11.26(7)(b)(iii) and complete only the tasks specified in sections 11.26(7)(d)(ii-iv) if:

(A) The system is a facility, such as a prison or a hospital, where the population supplied is unable to make improvements to plumbing or install point-of-use treatment devices; and

(B) The supplier supplies water as part of the cost of services provided and does not separately charge for water consumption.

(vi) For small community water systems, the supplier may modify the requirements for the distribution of the public education materials as follows:

(A) The supplier must complete at least one activity from the categories specified in 11.26(7)(c)(ii)(F)(I-IX).

(B) The supplier may limit the distribution of the public education materials specified in 11.26(7)(c)(ii)(B-D) to facilities and organizations supplied by the system that are most likely to be visited regularly by pregnant women and children.

(C) If the supplier distributes public education materials to every household supplied by the system, the Department may waive the requirement to submit a press release to newspaper, television, and radio stations as specified in 11.26(7)(c)(ii)(H).

(vii) If the system has met the lead action level in the most recent six-month compliance period, the supplier may discontinue the distribution of public education materials.

(A) If the lead action level is subsequently exceeded during any monitoring period, the supplier must resume the distribution of public education materials as specified in this section, 11.26(7)(c).

(d) Distribution of Public Education Materials for Non-transient, Non-community Water Systems

(i) For non-transient, non-community water systems, the supplier must distribute public education materials as specified in this section, 11.26(7)(d).

(ii) No later than 60 days after the end of the monitoring period in which the action level exceedance occurred, the supplier must:

(A) Post informational posters about lead in drinking water in a public place or common area in each of the buildings supplied by the system; and

(B) Distribute informational pamphlets and/or brochures about lead in drinking water to each individual supplied by the system. The Department may allow the supplier to use electronic transmission and/or printed materials as long as the same coverage is achieved.

(iii) If needed for implementation purposes, the Department may extend the 60-day deadline for the requirements specified in 11.26(7)(d)(ii), on a case-by-case basis, only if the extension is approved in writing before the deadline.

(iv) The supplier must repeat the tasks as specified in 11.26(7)(d)(ii) at least once during each calendar year that the lead action level is exceeded.

(v) If the system has met the lead action level in the most recent six-month compliance period, the supplier may discontinue the distribution of public education materials.

(A) If the lead action level is subsequently exceeded during any monitoring period, the supplier must resume the distribution of public education materials as specified in this section, 11.26(7)(d).

(e) Reporting Requirements for Public Education Materials

(i) The supplier must submit all written public education materials before distribution.

(A) If the Department requires the supplier to obtain approval for the content of written public education materials before distribution, the Department shall notify the supplier of this requirement no later than 15 days after receiving the lead and copper tap sample results.

(ii) No later than the 10th of the month following the end of each period that the supplier was required to complete public education tasks, the supplier must submit documentation that includes all of the following information:

(A) A copy of the public education materials that meet the content requirements specified in 11.26(7)(b).

(B) Demonstration that the applicable distribution requirements, specified in 11.26(7)(c) or 11.26(7)(d), were met.

(C) A list of all the newspapers, radio stations, television stations, and facilities and organizations to which the supplier distributed public education materials.

(I) If this list was previously submitted to the Department and there have been no changes, the supplier is not required to resubmit this information unless required by the Department. The supplier must certify that the public education materials were distributed to the same list previously submitted.

(f) Treatment Technique Violations and Response for Public Education Requirements

(i) If the supplier fails to comply with any of the content, distribution, or reporting requirements for public education materials, a treatment technique violation occurs.

(ii) In the event of a treatment technique violation, the supplier must:

(A) Notify the Department no later than 48 hours after the violation occurs; and

(B) Distribute Tier 2 public notice as specified in 11.33.

11.26(8) Reporting Requirements for a New Source or Long-Term Change in Water Treatment

(a) The Department must review and approve the addition of a new source or long-term change in treatment before it is implemented by the supplier.

(i) No later than a date specified by the Department or, if no date is specified, as soon as possible but before adding the new source or long-term change in treatment, the supplier must submit documentation describing the addition or change if:

(A) The system is deemed to have optimized corrosion control;

(B) The supplier is collecting lead and copper tap samples on a reduced frequency; or

(C) The supplier was granted a small system monitoring waiver from lead and copper tap sampling.

(ii) Examples of long-term treatment changes include:

(A) The addition of a new treatment process or modification of an existing treatment process including:

(I) Changing secondary disinfectants.

(II) Changing coagulants (e.g., alum to ferric chloride).

(III) Changing corrosion inhibitor products (e.g., orthophosphate to blended phosphate).

(B) Changes to dosing levels of existing chemicals if the supplier is planning long-term changes to its finished water pH or residual inhibitor concentration.

(iii) Changes to chemical dosing levels in response to changes in raw water quality are not considered long-term treatment changes.

11.27 COMPOSITING SAMPLES RULE

11.27(1) Applicability and Definitions

(a) For all public water systems, the supplier may composite samples if they comply with the requirements specified in this rule.

(b) "COMPOSITING" means combining samples before analysis, to reduce the total number of samples analyzed.

11.27(2) Compositing Samples for Nitrate, Nitrite, Inorganic Chemicals, VOCs, and SOCs

(a) To composite inorganic chemical, nitrate, nitrite, VOC, or SOC samples collected under 11.18, 11.19, 11.20, and 11.21 the supplier must comply with the requirements specified in this section 11.27(2).

(b) The supplier may composite samples from up to five entry points.

(i) For systems supplying greater than (>) 3,300 people, the supplier must only composite samples from entry points within a single public water system.

(ii) For systems supplying less than or equal to (≤) 3,300 people, the supplier may composite samples with other public water systems.

(c) Compositing of samples must be performed by certified laboratory personnel.

(d) Composite samples must be analyzed using a method where the method detection limit is less than (<) one-fifth (1/5) of the MCL.

(e) For VOCs and SOCs, the composite sample must be analyzed no later than 14 days after the first sample was collected.

(f) If a composite sample result is greater than or equal to (≥) one-fifth (1/5) the MCL for nitrate, nitrite, or an inorganic chemical, or greater than or equal to (≥) the cited detection limit for VOCs or SOCs, the supplier must collect a confirmation sample at each entry point included in the composite sample.

(i) The supplier must collect the confirmation samples no later than 14 days after receiving notification of the composite result.

(ii) The confirmation samples must be analyzed for the chemical that was:

(A) For nitrate, nitrite, or an inorganic chemical, greater than or equal to (≥) one-fifth (1/5) of the MCL; or

(B) For VOCs or SOCs, greater than or equal to (≥) the cited detection limit.

(iii) If duplicates of the original sample collected from each entry point used in the composite sample are available, the supplier may use these samples instead of collecting confirmation samples.

(A) The duplicate samples must be analyzed and the supplier must submit the sample results no later than 14 days after receiving the results of the original composite sample.

11.27(3) Compositing Samples for Gross Alpha Particle Activity, Combined Radium-226 and Radium-228, and Uranium

(a) To composite gross alpha particle activity, combined radium-226 and radium-228, and uranium samples collected under 11.22, the supplier must comply with the requirements specified in this section 11.27(3).

(b) The supplier may composite samples from up to four consecutive quarters from a single entry point.

(c) The composite sample must be analyzed no later than one year after the first sample was collected.

(d) The Department shall consider the composite sample result as an average of the individual samples included in the composite sample to determine compliance with the MCLs and to determine the future sampling frequency.

(e) If the composite sample result is greater than (>) one-half (1/2) the MCL, the Department may require the supplier to collect additional quarterly samples before allowing the supplier to sample at a reduced frequency.

11.27(4) Compositing Samples for Lead and Copper Entry Point Samples

(a) To composite lead and copper entry point samples collected under 11.26, the supplier must comply with the requirements specified in this section 11.27(4).

(b) The supplier may composite samples from no more than five entry points.

(c) Compositing of samples must be performed by certified laboratory personnel.

(d) If the lead concentration in the composite sample is greater than or equal to (≥) 0.001 mg/L or the copper concentration in the composite sample is greater than or equal to (≥) 0.160 mg/L, the supplier must collect confirmation samples no later than 14 days after receiving notification of the composite result.

(i) Instead of collecting confirmation samples, the supplier may use one of the following:

(A) Duplicates of each original sample used in the composite sample.

(B) The original samples used in the composite sample, if a sufficient volume is available.

11.28 STORAGE TANK RULE

11.28(1) Applicability and Definitions

(a) All public water systems that use finished water storage tanks must comply with the requirements specified in this rule..

(b) “COMPREHENSIVE INSPECTION” means an internal and external storage tank inspection to identify sanitary defects that covers all aspects of the condition of the storage tank including but not limited to sanitary, structural, and coating systems conditions, as well as security and safety concerns.

(c) "FINISHED WATER STORAGE TANK" means a tank or vessel owned by the supplier that is located downstream of the entry point and is not pressurized at the air water interface. Pressurized storage tanks are not included in the definition of finished water storage tanks.

(d) "PERIODIC INSPECTION" means a visual external storage tank inspection that is typically performed by the supplier to identify evident sanitary defects (e.g., lack of screens on vents).

11.28(2) Written Plan for Finished Water Storage Tank Inspections Requirements

(a) The supplier must develop and maintain a written plan for finished water storage tank inspections which must include all of the following:

(i) An inventory of finished water storage tank(s) including all of the following information for each finished water storage tank:

(A) Tank type and construction materials (e.g., elevated, buried, etc.).

(B) Volume in gallons.

(C) Approximate dimensions.

(D) Location.

(E) Number of inlets, outlets, overflows, hatches, and vents.

(F) Coating systems.

(G) Date put in service.

(H) Rehabilitation and major maintenance history.

(ii) The methods for performing and documenting periodic and comprehensive inspections for each finished water storage tank including identification of qualified personnel to perform periodic and comprehensive inspections.

(iii) The schedule for performing periodic and comprehensive inspections for each finished water storage tank. The supplier may conduct inspections more frequently than the minimum requirements listed below.

(A) Periodic inspections of each finished water storage tank must be performed at least twice each calendar year.

I. For systems operating year-round, in order for a periodic inspection to be considered as applying toward the minimum number of two per year, the periodic inspections must be separated by at least two (2) calendar months but not more than eight (8) calendar months on a continuous year-to-year basis.

II. For seasonal systems, a periodic inspection must be completed during Department-approved start-up procedures as specified in 11.16(6)(a) and at least once while serving water to the public. There must be at least 30 days between the first inspection at start-up and the last periodic inspection within a calendar year.

(B) Comprehensive inspections of each finished water storage tank must be scheduled and performed at least every five calendar years or on an alternative schedule.

(C) If the supplier schedules periodic or comprehensive inspections on an alternative schedule, the supplier must provide justification for the alternative schedule in the written plan for finished water storage tank inspections. The justification for the alternative schedule must be acceptable to the Department.

(iv) The timelines for correcting typical storage tank sanitary defects that the supplier will use to develop corrective action schedules. The supplier must at least address timelines for the following typical sanitary defects: improper screening or protection on vents and overflows, inadequate hatches, and unprotected openings.

(b) The written plan for finished water storage tank inspections is subject to Department review and revision.

11.28(3) Treatment Technique Requirements for Storage Tanks

(a) The supplier is prohibited from using uncovered finished water storage tanks.

(i) "UNCOVERED FINISHED WATER STORAGE TANK" means a tank, reservoir, or other facility used to store water that will undergo no further treatment except residual disinfection and that is open to the atmosphere.

(b) The supplier must operate and maintain finished water storage tanks so that they are free of sanitary defects.

(c) The supplier must perform periodic inspections of each finished water storage tank.

(d) The supplier must perform comprehensive inspections of each finished water storage tank. If a third party (e.g. diving company) performs a storage tank inspection, the supplier must interpret the inspection observations and properly identify sanitary defects.

(e) The supplier must implement the written plan for finished water storage tank inspections.

(f) If any sanitary defects are identified during a periodic or comprehensive inspection, the supplier must develop and implement a corrective action schedule for correcting each sanitary defect.

(g) The supplier must develop an inspection summary no later than 60 days after each completed inspection that includes all of the following information:

(i) The date and type of inspection performed.

(ii) Inspection findings and tank conditions.

(iii) Any sanitary defects identified during the inspection.

(iv) If sanitary defects are identified, the corrective action schedule for correcting sanitary defects.

(v) If sanitary defects are identified, the corrective actions completed and the associated completion dates.

11.28(4) Violations of the Storage Tank Rule

(a) If the supplier fails to develop or maintain an acceptable written plan for finished water storage tank inspections, a storage tank rule violation occurs.

(b) If the supplier fails to perform or document the minimum number of periodic inspections, a storage tank rule violation occurs.

(c) Per Section 11.35(2)(c), violations of the storage tank rule must be reported to the Division within 48 hours of the supplier becoming aware of them. The following constitute treatment technique violations:

(i) The supplier uses an uncovered finished water storage tank.

(ii) The supplier fails to perform or document at least one periodic inspection in a twelve month period.

(iii) The supplier fails to perform or document comprehensive inspections.

(iv) The supplier fails to implement the written plan for finished water storage tank inspections.

(v) The supplier fails to complete or document corrective action or follow a corrective action schedule for any sanitary defects identified during a periodic or comprehensive inspection.

11.28(5) Response to Violations of the Storage Tank Rule

(a) In the event of a storage tank rule violation, the supplier must:

(i) Notify the department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 3 public notice as specified in 11.33.

(b) In the event of a treatment technique violation, the supplier must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 2 public notice as specified in 11.33.

11.29 RESERVED

11.30 RESERVED

11.31 RESERVED

11.32 RESERVED

11.33 PUBLIC NOTIFICATION RULE

11.33(1) Applicability and Definitions

(a) For all public water systems, the supplier must comply with the public notice requirements specified in this rule for the violations or situations specified in Table 11.33-I.

TABLE 11.33-I VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING A PUBLIC NOTICE	
CPDWR violations	Failure to comply with an MCL or MRDL
	Failure to comply with a treatment technique requirement
	Failure to perform required water quality monitoring
	Failure to comply with required testing procedures
Variance or exemption under 11.43	Operation under a variance or an exemption
	Failure to comply with the terms and schedule of any variance or exemption
Other situations requiring public notice	Occurrence of a waterborne disease outbreak or other waterborne emergency
	Exceedance of the elevated nitrate MCL by non-community water systems, when granted Department approval as specified in 11.18(2)(d)
	Exceedance of the secondary maximum contaminant level for fluoride
	Availability of unregulated contaminant monitoring data
	Repeated failure to sample the source water for *Cryptosporidium*
	Failure to determine bin classification
	Groundwater systems with a waiver from disinfection requirements under 11.13
	Significant deficiencies identified at non-community groundwater systems
	Other violations and situations determined by the Department to require a public notice

(b) Public notice requirements are divided into three tiers based on the seriousness of the violation or situation and any potential public health effects. Each tier has different requirements. The tiers are as follows:

(i) “TIER 1 PUBLIC NOTICE” means the public notice required for violations and situations with significant potential to have serious adverse effects on public health as a result of short-term exposure.

(ii) “TIER 2 PUBLIC NOTICE” means the public notice required for violations and situations with potential to have serious adverse effects on public health.

(iii) “TIER 3 PUBLIC NOTICE” means the public notice required for all other violations and situations not included in Tier 1 or Tier 2.

11.33(2) Tier 1 Public Notice Form, Manner, and Frequency of Notice

(a) The supplier must distribute Tier 1 public notice for the following violations or situations specified in Table 11.33-II:

TABLE 11.33-II VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING TIER 1 PUBLIC NOTICE	
Violation or Situation Description	As specified in
Failure to test for fecal coliforms or *E. coli* following a total coliform-positive repeat sample	11.16(e)
Violation of the *E. coli* MCL	11.16(11)(a)
Violation of the nitrate, nitrite, or total nitrate and nitrite MCL	11.18(5)(a)

TABLE 11.33-II VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING TIER 1 PUBLIC NOTICE	
Violation or Situation Description	As specified in
Failure to collect a confirmation sample no later than 24 hours after a nitrate or nitrite sample result greater than (>) the MCL	11.18(3)(b)(vii) and 11.18(3)(c)(v)
Exceedance of the elevated nitrate MCL by non-community water systems, permitted to exceed the MCL by the Department	11.18(2)(d)
Acute violation of the chlorine dioxide MRDL	11.23(2)(e)(i)(A)
Failure to collect the required chlorine dioxide samples in the distribution system	11.23(2)(e)(i)(B)
Violation of the maximum turbidity limit treatment technique requirement, as required by the Department after consultation	11.8(2)(d)(i)(B)
Occurrence of a waterborne disease outbreak or other waterborne emergency (e.g. failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination)	.
For groundwater systems, presence of *E. coli*, enterococci, or coliphage in a source water sample	11.11(4)(d)(i) and 11.11(5)(c)(i)
Other violations or situations with significant potential to have serious adverse effects on public health as a result of short-term exposure, as determined by the Department either in *Colorado Primary Drinking Water Regulations* or on a case-by-case basis	.

(b) For Tier 1 public notice the supplier must:

(i) Distribute public notice as soon as possible, but no later than 24 hours after learning of the violation or situation.

(ii) Begin consultation with the Department as soon as possible, but no later than 24 hours after learning of the violation or situation, to determine additional public notice requirements.

(A) The supplier must comply with any additional public notification requirements set up as a result of the consultation with the Department (e.g., the timing, form, manner, frequency, and content of repeat notices, if any, and other actions to reach all consumers).

(iii) Distribute the public notice in a form and manner that fits the specific situation and is designed to reach residential, transient, and non-transient consumers. The supplier must use one or more of the following delivery methods:

(A) Appropriate broadcast media, including radio, television and a phone call to each consumer using a reverse 911 system, where available.

(B) Hand delivery of the notice to consumers.

(C) Another direct delivery method approved, in writing, by the Department.

(c) The Department may also require posting of the public notice in conspicuous locations throughout the area supplied by the system.

11.33(3) Tier 2 Public Notice Form, Manner, and Frequency of Notice

(a) The supplier must distribute Tier 2 public notice for the following violations or situations specified in Table 11.33-III:

TABLE 11.33-III VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING TIER 2 PUBLIC NOTICE	
Violation or Situation Description	As specified in
Violations of the MCL, MRDL, or treatment technique requirements, except where Tier 1 public notice is required or where the Department determines that Tier 1 public notice is required	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Violations of the monitoring and testing procedure requirements, if the Department determines that Tier 2 public notice is required instead of Tier 3 public notice, considering potential public health impacts and the persistence of the violation	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Failure to comply with the terms and schedule of any variance or exemption	11.43
For groundwater systems, failure to maintain at least 4-log treatment of viruses at the entry point	11.11(3)(e)(i)
Failure to complete corrective action	11.38(4)(a), 11.11(6)(c)(i) 11.16(9)

(b) For Tier 2 public notice the supplier must:

(i) Distribute public notice as soon as possible, but no later than 30 days after learning of the violation or situation.

(A) If the supplier posts the public notice, the notice must remain in place for as long as the violation or situation persists or for seven days, whichever is longer.

(B) The Department may grant a written extension for the initial public notice of up to three months from the time the supplier learns of the violation.

(I) The Department shall not grant an extension to the 30-day deadline for any unresolved violation(s) or allow across-the-board extensions for violations or situations requiring Tier 2 public notice.

(ii) Repeat the distribution of the public notice every three months as long as the violation or situation persists.

(A) Based on the circumstances, the Department may require a different repeat notice frequency.

(I) In no case will the repeat public notice frequency be less than annual.

(II) The Department shall not allow a less frequent repeat public notice for any of the following situations:

(a) An MCL or treatment technique violation under 11.16.

(b) A treatment technique violation under 11.8.

(c) Across-the-board reductions for other ongoing violations requiring a Tier 2 repeat public notice.

(III) If the Department allows repeat public notices to be distributed less frequently than once every three months, the decision must be documented in writing.

(iii) Distribute the public notice and any repeat public notices in a form and manner that fits the specific situation and is designed to reach residential, transient, and non-transient consumers. The supplier must meet all of the following distribution requirements:

(A) For community water systems, unless otherwise directed in writing by the Department, the supplier must distribute public notice by:

(I) Mail or other direct delivery method to each customer and to other service connections; and

(II) Any other method designed to reach all other consumers regularly supplied by the system. Such consumers may include those who do not pay water bills or do not have service connection addresses (e.g., house renters, apartment dwellers, university students, nursing home patients, prison inmates, etc.). Other methods may include publication in a local newspaper, delivery of multiple copies for distribution by customers that provide their drinking water to others (e.g., apartment building owners or large private employers), posting in public places supplied by the system or on the Internet, or delivery to community organizations.

(B) For non-community water systems, unless otherwise directed in writing by the Department, the supplier must distribute public notice by:

(I) Posting the notice in conspicuous locations throughout the distribution system frequented by consumers or by mail or direct delivery to each customer and service connection; and

(II) Any other method designed to reach all other consumers. Such consumers may include those supplied who may not see a posted notice because the posted notice is not in a location they routinely pass by. Other methods may include publication in a local newspaper or newsletter distributed to customers, use of E-mail to notify employees or students, or delivery of multiple copies in central locations (e.g., community centers).

11.33(4) Tier 3 Public Notice Form, Manner, and Frequency of Notice

(a) The supplier must distribute Tier 3 public notice for the following violations or situations specified in Table 11.33-IV:

TABLE 11.33-IV VIOLATION CATEGORIES AND OTHER SITUATIONS REQUIRING TIER 3 PUBLIC NOTICE

Violation or Situation Description	As specified in
Monitoring, reporting, and recordkeeping violations, except where a Tier 1 or Tier 2 public notice is required	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Failure to comply with a testing procedure, except where a Tier 1 or Tier 2 public notice is required	Under Regulation 11 for all monitoring and reporting violations or 11.33 for public notification.
Operation under a variance or an exemption	11.43
Availability of unregulated contaminant monitoring results	11.47
Exceedance of the fluoride secondary maximum contaminant level	11.19(7)
Revised Total Coliform Rule reporting and recordkeeping violations	11.16(11), 11.16(12), and 11.36(4)(d)

(b) For Tier 3 public notice the supplier must:

(i) Distribute public notice as soon as possible, but no later than one year after learning of the violation or situation or beginning operation under a variance or an exemption.

(A) If the supplier is required to distribute more than one Tier 3 public notice, the supplier may use an annual report detailing all violations and situations that occurred during the previous 12 months instead of individual Tier 3 public notices, as long as the timing requirements specified in 11.33(4)(b)(i) are met.

(B) For community water systems, the supplier may use the consumer confidence report (CCR) specified in 11.34 to comply with the Tier 3 public notice requirements if the CCR meets all of the following criteria:

(I) The CCR is distributed to customers no later than 12 months after the supplier learns of the violation or situation.

(II) The Tier 3 public notice in the CCR complies with the content requirements specified in 11.33(5).

(III) The CCR is distributed as specified in 11.33(3)(b)(iii).

(C) If the supplier posts the public notice, the notice must remain in place for as long as the violation or situation persists or for seven days, whichever is longer.

(ii) Repeat the distribution of the public notice annually as long as the violation, variance, exemption, or other situation persists.

(A) For community water systems, the supplier may use the CCR specified in 11.34 to comply with the repeat Tier 3 public notice requirement if the requirements specified in 11.33(4)(b)(i)(B)(I-III) are met.

(iii) Distribute the public notice and any repeat public notices as specified in 11.33(3)(b)(iii).

11.33(5) Content of the Public Notice

(a) The supplier must include all of the following ten elements in all public notices:

(i) A description of the violation or situation, including the contaminant(s) of concern, and the applicable contaminant level(s).

(ii) When the violation or situation occurred.

(iii) Any potential adverse health effects from the violation or situation, including the standard language under 11.33(5)(b) or (c), whichever is applicable.

(iv) The population at risk, including sub-populations particularly vulnerable if exposed to the contaminant in drinking water.

(v) Whether alternative water supplies should be used.

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

(vii) What the supplier is doing to correct the violation or situation.

(viii) When the supplier expects to return to compliance or resolve the situation.

(ix) The name, business address, and phone number for the supplier or designee that the consumer may call for additional information about the public notice.

(x) The following language, where applicable:

(A) "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) For each applicable MCL, MRDL, treatment technique violation, or other situation requiring public notice specified in Table 11.33-V, the supplier must include in the public notice the corresponding health effects language specified in Table 11.33-VI.

(c) For all monitoring and testing procedure violations specified in Table 11.33-V, the supplier must include in the public notice the following language, exactly as written, and the specific information for the text in brackets:

(i) We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we "did not monitor or test" or "did not complete all monitoring or testing" for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.

(d) If the system is operating under a variance or exemption, the supplier must include all of the following information in all public notices:

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

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

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

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

(e) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, or if the Department has not yet made this determination, the supplier must include either of the following:

(i) Information in the appropriate language(s) regarding the importance of the public notice.

(ii) A telephone number or address where the consumer may contact the supplier to obtain a translated copy of the public notice or request assistance in the appropriate language.

(f) All public notices must meet all of the following criteria:

(i) Not include overly technical language or very small print.

(ii) Not be formatted in a way that defeats the purpose of the public notice.

(iii) Not include language that defeats the purpose of the public notice.

(iv) Be displayed in a conspicuous way when printed or posted.

11.33(6) General Distribution Requirements

(a) The supplier must distribute public notice to consumers supplied by the public water system.

(i) For wholesale systems, the wholesaler must distribute the public notice to the supplier(s) responsible for the consecutive system(s).

(A) For consecutive systems, the supplier responsible for the consecutive system must distribute the public notice received from the wholesaler to consumers supplied by the consecutive system.

(ii) If a system has a violation that affects only a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system and the supplier is granted approval by the Department in writing the supplier may limit public notice distribution to only the consumers supplied by the portion of the distribution system which is out of compliance.

(b) Public Notice Distribution to New Customers

(i) For community water systems, the supplier must provide a copy of the most recent public notice for any continuing violation, variance or exemption, or other ongoing situation(s) requiring a public notice to all new customers no later than the time service begins.

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

(c) Public Notice Distribution by the Department on Behalf of the Public Water System

(i) The Department may distribute the public notice on behalf of the supplier in accordance with the requirements specified in this rule.

(A) Regardless, the supplier remains responsible for ensuring that the requirements specified in this rule are met.

11.33(7) Public Notice Reporting Requirements

No later than 10 calendar days after completing initial or repeat public notice requirements, the supplier must submit a certification that states that the supplier has fully complied with the public notice requirements.

(a) The supplier must include a representative copy of each public notice distributed, published, posted, and/or made available to consumers and the media.

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]				
Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
Violations of *Colorado Primary Drinking Water Regulations*[2]				
Microbiological Contaminants				
Total coliform (TT violations resulting from failure to conduct assessments or corrective actions, and violations resulting from failure to monitor or report)	2	11.16(11)(b)	3	11.16(11)(c-d) 11.16(12)(b)
Seasonal system failure to follow Department-approved start-up procedures before supplying water to the public or failure to submit certification of completed start-up procedures	2	11.16(11)(b)(ii)	3	11.16(11)(d)(iii)
E. coli (MCL violation, monitoring violations, and reporting violations)	1	11.16(11)(a)	3	11.16(11)(c) 11.16(11)(d) 11.16(12)(a) 11.16(12)(c)
E. coli (TT violations resulting from failure to conduct Level 2 assessments or corrective action)	2	11.16(11)(b)(i)	N/A	N/A
Turbidity MCL	2	11.8(2)(d)	3	11.8(2)(c)
Turbidity (for TT violations resulting from a single exceedance of maximum allowable turbidity level)	2, 1[3]	11.8(2)(d)	3	11.8(2)(c), 11.8(2)(g), 11.46(7)
Surface Water Treatment Rule violations, other than violations resulting from single exceedance of maximum allowable turbidity level (TT)	2	11.8(2)(b)	3	11.8(2)(c), 11.46(7)
Surface Water Treatment Rule: Filter Backwash Recycle Rule	2	11.9(2)	3	11.9(3)
Surface Water Treatment Rule: Enhanced Treatment for *Cryptosporidium* Rule	2	11.10(3)(c), 11.10(4)(b)	2, 3[4]	11.10(2)
Groundwater Rule	2	11.11(2)(d), 11.11(6)(c), 11.11(3)(e)(i), 11.38(4)	3	11.11(2)(c), 11.11(3), 11.11(4), 11.11(5), 11.11(6), 11.38(4)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]				
Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
Disinfectant residual (TT in the distribution system)	2	11.8(3)(d)(i), 11.11(2)(d)(i)	3	11.8(3)(c)(i), 11.11(2)(c)(i)
Disinfectant residual for public water systems that haul water	N/A	N/A	3	11.8(3)(c)(i)(B), 11.11(2)(c)(i)(B), 11.41(2)(b)
Inorganic Chemicals				
Antimony	2	11.19(5)	3	11.19(3)
Arsenic	2	11.19(5)	3	11.19(3)
Asbestos (fibers >10 µm)	2	11.19(5)	3	11.19(3)
Barium	2	11.19(5)	3	11.19(3)
Beryllium	2	11.19(5)	3	11.19(3)
Cadmium	2	11.19(5)	3	11.19(3)
Chromium (total)	2	11.19(5)	3	11.19(3)
Cyanide	2	11.19(5)	3	11.19(3)
Fluoride	2	11.19(5)	3	11.19(3)
Mercury (inorganic)	2	11.19(5)	3	11.19(3)
Nitrate	1	11.18(5)	1[5], 3	11.18(3)
Nitrite	1	11.18(5)	1[5], 3	11.18(3)
Total Nitrate and Nitrite	1	11.18(5)	3	11.18(3)
Selenium	2	11.19(5)	3	11.19(3)
Thallium	2	11.19(5)	3	11.19(3)
Lead and Copper Rule				
Lead and Copper Rule (TT)	2	11.26(3)(e), 11.26(4)(k), 11.26(5)(i), 11.26(6)(d), 11.26(7)(f)	3	11.26(2)(d), 11.26(4), 11.26(5)
Synthetic Organic Chemicals (SOCs)				
2,4–D	2	11.21(6)	3	11.21(3)(d)
2,4,5–TP (Silvex)	2	11.21(6)	3	11.21(3)(d)
Alachlor	2	11.21(6)	3	11.21(3)(d)
Atrazine	2	11.21(6)	3	11.21(3)(d)
Benzo(a)pyrene (PAHs)	2	11.21(6)	3	11.21(3)(d)
Carbofuran	2	11.21(6)	3	11.21(3)(d)
Chlordane	2	11.21(6)	3	11.21(3)(d)
Dalapon	2	11.21(6)	3	11.21(3)(d)
Di (2-ethylhexyl) adipate	2	11.21(6)	3	11.21(3)(d)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]				
Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
Di (2-ethylhexyl) phthalate	2	11.21(6)	3	11.21(3)(d)
Dibromochloropropane	2	11.21(6)	3	11.21(3)(d)
Dinoseb	2	11.21(6)	3	11.21(3)(d)
Dioxin (2,3,7,8-TCDD)	2	11.21(6)	3	11.21(3)(d)
Diquat	2	11.21(6)	3	11.21(3)(d)
Endothall	2	11.21(6)	3	11.21(3)(d)
Endrin	2	11.21(6)	3	11.21(3)(d)
Ethylene dibromide	2	11.21(6)	3	11.21(3)(d)
Glyphosate	2	11.21(6)	3	11.21(3)(d)
Heptachlor	2	11.21(6)	3	11.21(3)(d)
Heptachlor epoxide	2	11.21(6)	3	11.21(3)(d)
Hexachlorobenzene	2	11.21(6)	3	11.21(3)(d)
Hexachlorocyclo-pentadiene	2	11.21(6)	3	11.21(3)(d)
Lindane	2	11.21(6)	3	11.21(3)(d)
Methoxychlor	2	11.21(6)	3	11.21(3)(d)
Oxamyl (Vydate)	2	11.21(6)	3	11.21(3)(d)
Pentachlorophenol	2	11.21(6)	3	11.21(3)(d)
Picloram	2	11.21(6)	3	11.21(3)(d)
Polychlorinated biphenyls (PCBs)	2	11.21(6)	3	11.21(3)(d)
Simazine	2	11.21(6)	3	11.21(3)(d)
Toxaphene	2	11.21(6)	3	11.21(3)(d)
Volatile Organic Chemicals (VOCs)				
Benzene	2	11.21(6)	3	11.21(3)(b)
Carbon tetrachloride	2	11.21(6)	3	11.21(3)(b)
Chlorobenzene (monochlorobenzene)	2	11.21(6)	3	11.21(3)(b)
o-Dichlorobenzene	2	11.21(6)	3	11.21(3)(b)
p-Dichlorobenzene	2	11.21(6)	3	11.21(3)(b)
1,2-Dichloroethane	2	11.21(6)	3	11.21(3)(b)
1,1-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
cis-1,2-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
trans-1,2-Dichloroethylene	2	11.21(6)	3	11.21(3)(b)
Dichloromethane	2	11.21(6)	3	11.21(3)(b)
1,2-Dichloropropane	2	11.21(6)	3	11.21(3)(b)
Ethylbenzene	2	11.21(6)	3	11.21(3)(b)
Styrene	2	11.21(6)	3	11.21(3)(b)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]				
Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
Tetrachloroethylene	2	11.21(6)	3	11.21(3)(b)
Toluene	2	11.21(6)	3	11.21(3)(b)
1,2,4-Trichlorobenzene	2	11.21(6)	3	11.21(3)(b)
1,1,1-Trichloroethane	2	11.21(6)	3	11.21(3)(b)
1,1,2-Trichloroethane	2	11.21(6)	3	11.21(3)(b)
Trichloroethylene	2	11.21(6)	3	11.21(3)(b)
Vinyl chloride	2	11.21(6)	3	11.21(3)(b)
Xylenes (total)	2	11.21(6)	3	11.21(3)(b)
Radionuclides				
Beta/photon emitters	2	11.22(5)	3	11.22(3)(c)
Alpha emitters	2	11.22(5)	3	11.22(3)(b)
Combined radium (226 & 228)	2	11.22(5)	3	11.22(3)(b)
Uranium	2	11.22(5)	3	11.22(3)(b)
Disinfection Byproducts (DBPs), Disinfection Byproduct Precursors, Disinfectant Residuals Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The Department sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).				
Total trihalomethanes (TTHMs)	2	11.25(1)(g)	3	11.25(1)(c)
Haloacetic Acids (HAA5)	2	11.25(1)(g)	3	11.25(1)(c)
Bromate	2	11.25(3)(c)	3	11.25(3)(e)
Chlorite	2	11.25(2)(c)	3	11.25(2)(e)
Chlorine (MRDL)	2	11.23(1)(e)	3	11.23(1)(c)
Chloramine (MRDL)	2	11.23(1)(e)	3	11.23(1)(c)
Chlorine dioxide (MRDL), where any 2 consecutive daily samples at entrance to distribution system only are above MRDL	2	11.23(2)(e)(ii)	2[6], 3	11.23(2)(c)
Chlorine dioxide (MRDL), where sample(s) in distribution system the next day are also above MRDL	1[7]	11.23(2)(e)(i)	1	11.23(2)(c)
Control of DBP precursors—TOC (TT)	2	11.24(9)	3	11.24(3)
Disinfection profiling and benchmarking	2	11.8(4)(d), 11.8(5)(d)	3	11.8(4), 11.8(5)
Development of monitoring plan	N/A	N/A	3	11.25(1)(d)
Other Treatment Techniques				
Acrylamide (TT)	2	11.21(6)(b)	N/A	N/A
Epichlorohydrin (TT)	2	11.21(6)(b)	N/A	N/A

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE[1]				
Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
Water hauler failure to operate in accordance with Department-approved operational plan	2	11.41(3)(a)	N/A	N/A
Storage Tanks (TT)	2	11.28(4)(b)	N/A	N/A
Unregulated Contaminant Monitoring[8]				
Unregulated contaminants	N/A	N/A	3	11.47
Nickel	N/A	N/A	3	11.19(3)(b)
Public Notification for Variances and Exemptions				
Operation under a variance or exemption	3	11.43(10)(f)[9]	N/A	N/A
Violation of conditions of a variance or exemption	2	11.43(10)(f)[10]	N/A	N/A
Other Situations Requiring Public Notification				
Fluoride secondary maximum contaminant level (SMCL) exceedance	3	11.19(7)	N/A	N/A
Exceedance of nitrate MCL for non-community water systems, as allowed by the Department	1	11.18(2)(d)	N/A	N/A
Availability of unregulated contaminant monitoring data	3	11.47	N/A	N/A
Waterborne disease outbreak	1	11.3(81)	N/A	N/A
Other waterborne emergency[11]	1	N/A	N/A	N/A
Source Water Sample Positive for GWR Fecal indicators: *E. coli*, enterococci, or coliphage	1	11.11(4)(d)(i), 11.11(5)(c)(i)	N/A	N/A
Waiver of Disinfection	N/A	N/A	N/A	11.13(2)
Backflow Prevention and Cross Connection Control Rule violations	2	11.39(6)(a)	3	11.39(6)(b)
Direct Potable Reuse Rule violations	1, 2	11.14	3	11.14
Other situations as determined by the Department	1, 2, 3[12]	N/A	N/A	N/A

1 Violations and other situations not listed in this table (e.g., failure to prepare Consumer Confidence Reports) do not require notice, unless otherwise determined by the Department. The Department may, at its discretion, also require a more stringent public notice tier (e.g., Tier 1 instead of Tier 2 or Tier 2 instead of Tier 3) for specific violations and situations specified in Table 11.33-V, as authorized under 11.33(2)(a) and 11.33(3)(a).

2 The term “Violations of Colorado Primary Drinking Water Regulations” is used here to include violations of MCL, MRDL, treatment technique, monitoring, and testing procedure requirements.

3 Systems with treatment technique violations involving a single exceedance of a maximum turbidity limit under 11.8(2)(b) are required to consult with the Department no later than 24 hours after learning of the violation. Based on this consultation, the Department may elevate the violation to Tier 1. If the supplier is unable to make contact with the Department in the 24-hour period, the violation is automatically elevated to Tier 1.

4 Failure to collect three or more samples for Cryptosporidium analysis requires a special Tier 2 public notice as specified in 11.10(2)(e). All other monitoring and testing procedure violations require Tier 3 public notice.

5 Failure to collect a confirmation sample no later than 24 hours for nitrate or nitrite after an initial sample exceeds the MCL requires Tier 1 public notice. Other monitoring violations for nitrate require Tier 3 public notice.

6 Failure to monitor for chlorine dioxide at the entry point the day after exceeding the MRDL at the entrance to the distribution system requires Tier 2 public notice.

7 If any daily sample collected at the entry point exceeds the MRDL for chlorine dioxide and one or more samples collected in the distribution system the next day exceed the MRDL, Tier 1 public notice is required. Failure to collect the required samples in the distribution system after the MRDL is exceeded at the entry point also triggers Tier 1 public notice.

8 Some water systems must monitor for certain unregulated contaminants under 11.47.

9 This citation refers to §§1415 and 1416 of the Safe Drinking Water Act. §§1415 and 1416 require that “a schedule prescribed . . . for a public water system granted a variance shall require compliance by the system . . .”

10 In addition to §§1415 and 1416 of the Safe Drinking Water Act, 11.43(3) of the Colorado Primary Drinking Water Regulations specifies the items and schedule milestones that must be included in a variance for small systems.

11 Other waterborne emergencies require a Tier 1 public notice under 33.2(a) for situations that do not meet the definition of a waterborne disease outbreak specified in 11.3, but that still have the potential to have serious adverse effects on health as a result of short-term exposure. These could include outbreaks not related to treatment deficiencies, as well as situations that have the potential to cause outbreaks, such as failures or significant interruption in water treatment processes, natural disasters that disrupt the water supply or distribution system, chemical spills, or unexpected loading of possible pathogens into the source water.

12 The Department may place other situations in any tier believed appropriate, based on threat to public health.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Colorado Primary Drinking Water Regulations			
Microbiological Contaminants			
Fecal Indicators (GWR) 1. *E. coli* 2. Enterococci 3. Coliphage)	None	TT	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short- term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.
Groundwater Rule (GWR) TT violations	None	TT	Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.
A violation that occurred for failure to conduct an assessment not triggered by the presence of *E. coli* and/or violations for corrective action		TT	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. [THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment(s).

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
A violation that occurred for failure to conduct an assessment triggered by the presence of *E. coli* and/or violations for corrective action[3]		TT	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for *E. coli,* indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found. [THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.] We failed to conduct the required assessment. We failed to correct all identified sanitary defects that were found during the assessment that we conducted.
E. coli MCL violations	Zero	See footnote 2	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems.
A violation occurred for failure to conduct seasonal start-up procedures	None	TT	Failure to perform the required start-up procedures prior to serving water to the public has the potential to distribute contaminated water. When our system shuts down operation, the lack of pressure in our pipes can allow the entry of bacteria and other disease-causing microorganisms into the drinking water. By performing start-up procedures such as flushing the pipes, disinfecting the water, and collecting a coliform bacteria sample before we open, we can be sure that we are providing you with safe water.
Turbidity	None	TT	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.
Disinfectant residual	N/A	TT (in the distribution system)	Disinfectant residual serves as one of the final barriers to protect public health. Lack of an adequate disinfectant residual may increase the likelihood that disease-causing organisms are present.
Surface Water Treatment Rule, Surface Water Treatment Rule: Filter Backwash Recycle Rule, and Surface Water Treatment Rule: Enhanced Treatment for Cryptosporidium Rule violations			
Giardia lamblia	Zero	TT[3]	Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Viruses			
Heterotrophic plate count (HPC) bacteria[4]			

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Legionella			
Cryptosporidium			
Inorganic Chemicals			
Antimony	0.006	0.006	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.
Arsenic	0	0.010	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos (10 µm)	7 MFL	7 MFL	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium	2	2	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium	0.004	0.004	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Cadmium	0.005	0.005	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.
Chromium (total)	0.1	0.1	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Cyanide	0.2	0.2	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride	4.0	4.0	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.
Mercury (inorganic)	0.002	0.002	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Total Nitrate and Nitrite	10	10	Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium	0.05	0.05	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.
Thallium	0.0005	0.002	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Lead and Copper			
Lead	Zero	TT[5]	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Copper	1.3	TT[6]	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Synthetic Organic Chemicals (SOCs)			
2,4–D	0.07	0.07	Some people who drink water containing the weed killer 2,4–D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5–TP (Silvex)	0.05	0.05	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Alachlor	Zero	0.002	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.
Atrazine	0.003	0.003	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene (PAHs)	Zero	0.0002	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran	0.04	0.04	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Chlordane	Zero	0.002	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon	0.2	0.2	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di (2-ethylhexyl) adipate	0.4	0.4	Some people who drink water containing di (2-ethylhexyl) adipate well in excess of the MCL over many years could experience general toxic effects such as weight loss, liver enlargement or possible reproductive difficulties.
Di (2-ethylhexyl) phthalate	Zero	0.006	Some people who drink water containing di (2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloro-propane (DBCP)	Zero	0.0002	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Dinoseb	0.007	0.007	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Dioxin (2,3,7,8-TCDD)	Zero	$3x10^{-8}$	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Diquat	0.02	0.02	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Endothall	0.1	0.1	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.
Endrin	0.002	0.002	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Ethylene dibromide	Zero	0.00005	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate	0.7	0.7	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor	Zero	0.0004	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide	Zero	0.0002	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.
Hexachlorobenzene	Zero	0.001	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Hexachlorocyclo-pentadiene	0.05	0.05	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane	0.0002	0.0002	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor	0.04	0.04	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl (Vydate)	0.2	0.2	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.
Pentachlorophenol	Zero	0.001	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram	0.5	0.5	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Polychlorinated biphenyls (PCBs)	Zero	0.0005	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Simazine	0.004	0.004	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene	Zero	0.003	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile Organic Chemicals (VOCs)			
Benzene	Zero	0.005	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride	Zero	0.005	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (monochloro- benzene)	0.1	0.1	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene	0.6	0.6	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
p-Dichlorobenzene	0.075	0.075	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane	Zero	0.005	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
1,1-Dichloroethylene	0.007	0.007	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene	0.07	0.07	Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene	0.1	0.1	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane	Zero	0.005	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-Dichloropropane	Zero	0.005	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene	0.7	0.7	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.
Styrene	0.1	0.1	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloroethylene	Zero	0.005	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
Toluene	1	1	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
1,2,4-Trichlorobenzene	0.07	0.07	Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane	0.2	0.2	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
1,1,2-Trichloroethane	0.003	0.005	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.
Trichloroethylene	Zero	0.005	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Vinyl chloride	Zero	0.002	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (total)	10	10	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.
Radionuclides			
Beta/photon emitters	Zero	4 mrem/yr	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Alpha emitters	Zero	15 pCi/L	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (226 & 228)	Zero	5 pCi/L	Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium	Zero	30µg/L	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Disinfection Byproducts (DBPs), Disinfection Byproduct Precursors, Disinfectant Residuals Where disinfection is used in the treatment of drinking water, disinfectants combine with organic and inorganic matter present in water to form chemicals called disinfection byproducts (DBPs). The Department sets standards for controlling the levels of disinfectants and DBPs in drinking water, including trihalomethanes (THMs) and haloacetic acids (HAAs).[18]			
Total trihalomethanes (TTHMs)	N/A	0.080[7]	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer.
Haloacetic Acids (HAA)	N/A	0.060[8]	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Bromate	Zero	0.010	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Chlorite	0.08	1.0	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.
Chlorine	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Chloramines	4 (MRDLG)	4.0 (MRDL)	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Chlorine dioxide, where any 2 consecutive daily samples collected at the entrance to the distribution system are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system, which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers.
Chlorine dioxide, where one or more distribution system samples are above the MRDL.	0.8 (MRDLG)	0.8 (MRDL)	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. Add for public notification only: The chlorine dioxide violations reported today include exceedances of the State standard within the distribution system, which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure.
Control of DBP precursors (TOC)	None	TT	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these by-products in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Other Treatment Techniques			
Acrylamide	Zero	TT	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Epichlorohydrin	Zero	TT	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Backflow Prevention and Cross-Connection Control Rule	None	TT	Uncontrolled cross connections can lead to a back pressure or siphonage event that may allow contaminants or disease-causing organisms to enter the drinking water, which can cause diarrhea, nausea, cramps, and associated headaches.
Storage Tank Rule	None	TT	Inadequately maintained storage tanks, identified through inspections, may allow contaminants or disease-causing organisms to enter the drinking water, which can cause diarrhea, nausea, cramps, and associated headaches.
Failure to Correct a Significant Deficiency	None	TT	An uncorrected significant deficiency may allow contaminants or disease-causing organisms to enter the drinking water, which can cause diarrhea, nausea, cramps, and associated headaches.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION			
Contaminant	MCLG mg/L	MCL mg/L	Standard health effects language for public notification
Direct Potable Reuse Rule			
Critical control point for pathogen reduction of *Cryptosporidium*, *Giardia lamblia*, and/or viruses	None	TT	Inadequately treated water from direct potable reuse may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches
Critical control point for chemical reduction	None	TT	The direct potable reuse processes are intended to remove or reduce the following list of compounds (Target chemicals list from application). Inadequately treated water from direct potable reuse may contain elevated levels of the compounds above. These compounds can cause adverse health effects including (Target chemical health effects language as defined in the *Direct Potable Reuse Policy* and included in department approval). Inadequately treated water from direct potable reuse may also contain elevated levels of unknown compounds that may be present in treated wastewater. Because these chemicals are not identified, the health effects for these compounds are unknown.

1 If the supplier is collecting at least 40 samples per month, no more than 5.0 percent of the monthly samples may be positive for total coliforms. If the supplier is collecting fewer than 40 samples per month, no more than one sample per month may be positive for total coliforms.

2 E. coli-positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an E. coli-positive routine sample, failure to collect all required repeat samples following an E. coli-positive routine sample, or failure to analyze a total-coliform positive repeat sample for E. coli.

3 11.8 treatment technique violations that involve turbidity exceedances may use the health effects language for turbidity instead.

4 The bacteria detected by heterotrophic plate count (HPC) are not necessarily harmful. HPC is simply an alternative method of determining disinfectant residual levels. The number of such bacteria is an indicator of whether there is enough disinfection in the distribution system.

5 Action Level = 0.015 mg/L

6 Action Level = 1.3 mg/L

7 The MCL for total trihalomethanes is the sum of the concentrations of the individual trihalomethanes.

8 The MCL for haloacetic acids is the sum of the concentrations of the individual haloacetic acids.

11.34 CONSUMER CONFIDENCE REPORT (CCR) RULE

11.34(1) Applicability and Definitions

(a) For community water systems, the supplier must distribute an annual consumer confidence report that complies with the requirements specified in this rule.

(i) For a wholesale system that supplies water to a consecutive community water system(s), the wholesaler must provide the applicable information to the supplier(s) responsible for the consecutive system(s) necessary to complete the CCR.

(b) "CONSUMER CONFIDENCE REPORT" or "CCR" means an annual report that includes information on the quality of the water supplied by a public water system and characterizes the risks, if any, from exposure to contaminants detected in the drinking water in an accurate and understandable manner.

(c) "DETECTED" means a sample result was greater than or equal to (≥) the detection limits specified in 11.46 for disinfection byproducts and individual rules for inorganic chemical contaminants, volatile organic chemical contaminants, synthetic organic chemical contaminants, disinfection byproducts, and radioactive contaminants.

(d) "REGULATED CONTAMINANT" means a contaminant subject to a MCL, action level, MRDL, or treatment technique under the *Colorado Primary Drinking Water Regulations*.

11.34(2) Content Requirements for the CCR

(a) General Content Requirements for the CCR

(i) The supplier must include data collected for compliance purposes during the previous calendar year in the CCR.

(A) If the supplier sampled for a contaminant less frequently than annually, the supplier must include the date and result(s) of the most recent sampling for that contaminant.

(I) The supplier must include a brief statement that explains that the data presented are from the most recent sampling conducted.

(II) The supplier is not required to include data older than five years.

(ii) The supplier must include all of the following definitions in the CCR:

(A) *Maximum Contaminant Level Goal* (MCLG) means the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(B) *Maximum Contaminant Level* (MCL) means the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

(iii) If the CCR includes any of the following terms, the supplier must include the applicable definition(s) in the CCR:

(A) *Treatment Technique* means a required process intended to reduce the level of a contaminant in drinking water.

(B) *Action Level* means the concentration of a contaminant, which if exceeded, triggers treatment or other requirements that a water system must comply with.

(C) *Maximum residual disinfectant level goal* (MRDLG) means the level of a drinking water disinfectant below which, there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(D) *Maximum residual disinfectant level* (MRDL) means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(E) *Variances and Exemptions* mean that the supplier has Department permission to not meet an MCL or a treatment technique requirement under certain conditions.

(F) *Level 1 assessment* means a study of the water system to identify possible problems and determine, if possible, why total coliform bacteria have been found in our water system.

(G) *Level 2 assessment* means a very detailed study of the water system to identify possible problems and determine, if possible, why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

(iv) The supplier must include in the CCR the telephone number for the system that the consumer may call for additional information about the CCR.

(v) The supplier must include in the CCR information about opportunities for public participation in decisions that may affect the quality of the water (e.g., time and place of regularly scheduled board meetings).

(vi) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, the supplier must include either of the following in the CCR:

(A) Information in the appropriate language(s) regarding the importance of the CCR.

(B) A telephone number or address where the consumer may contact the supplier to obtain a translated copy of the CCR or request assistance in the appropriate language.

(vii) For each violation that occurs during the year covered by the CCR specified in 11.34(2)(d)(vi), the supplier must include a clear and readily understandable explanation of each violation, any potential adverse health effects, and the steps the supplier has taken to correct the violation.

(b) Language Requirements for the CCR

(i) The supplier must include all of the following language in the CCR, exactly as written:

(A) "Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791)."

(B) "Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791)."

(ii) The supplier must also include in the CCR a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water including bottled water.

(A) The supplier may use the following language or comparable language:

(I) "The sources of drinking water include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and also may come from gas stations, urban storm water runoff, and septic systems.

- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the Colorado Department of Public Health and Environment prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health."

(iii) The supplier must include in the CCR a short informational statement about lead in drinking water and its effects on children.

(A) The supplier may use the following language, providing the specific information for the text in brackets, or other Department-approved language written by the supplier:

(I) If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. [NAME OF WATER SYSTEM] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://water.epa.gov/drink/info/lead.

(c) Source Water Content Requirements for the CCR

(i) The supplier must include all of the following information about each of the system's sources in the CCR:

(A) The type of source (e.g., surface water or groundwater).

(B) The commonly used name(s) of the source(s), if any.

(C) The general location(s) of the source(s).

(D) If a source water assessment has been completed, the supplier must include all of the following:

(I) Notification of the availability of this information.

(II) How to obtain this information.

(III) If the Department has provided a source water assessment, a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the Department or written by the supplier.

(d) Detected Contaminant Content Requirements for the CCR

(i) The supplier must include in the CCR information on all of the following detected contaminants, except Cryptosporidium:

(A) Regulated contaminants.

(B) Unregulated contaminants that the supplier must sample for under 11.47.

(C) Unregulated detected contaminants in finished water that the supplier must monitor for under 11.14

(ii) The information for detected contaminants must be displayed in a table or several adjacent tables.

(A) If the supplier chooses to include information related to any additional sample results not required by 11.34(2)(d)(i), the supplier must display this information separately from the table(s) of detected contaminants.

(iii) For each regulated contaminant, the table(s) of detected contaminants must include all of the following:

(A) The MCL expressed as a whole number as specified in Table 11.34-I.

(I) If there is no MCL for a detected contaminant, the supplier must show in the table(s) that there is a treatment technique, or specify the action level, applicable to that contaminant.

(B) The MCLG expressed in the same units as the MCL.

(C) For contaminants subject to an MCL, except turbidity, total coliforms and *E. coli*, the highest contaminant level used to determine compliance and the range of detected levels as follows:

(I) If compliance with the MCL is determined annually or less frequently, the highest detected level and the range of all detected levels expressed in the same units as the MCL.

(II) If compliance with the MCL is determined based on a RAA, the RAA and range of all detected sample results expressed in the same units as the MCL.

(III) If compliance with the MCL is determined based on an LRAA, the highest LRAA and the range of all LRAAs expressed in the same units as the MCL.

(a) For the TTHM and HAA5 MCLs, the supplier must also include the range of all individual sample results expressed in the same units as the MCL.

(b) For the TTHM and HAA5 MCLs, if more than one LRAA exceeds the MCL, the supplier must include the LRAAs for all sampling locations that exceeded the MCL.

(D) For turbidity reported under 11.8, the highest single turbidity measurement and the lowest monthly percentage of samples meeting the turbidity limit specified in 11.8 for the filtration technology being used.

(I) The supplier should include an explanation of the reasons for measuring turbidity.

(E) For lead and copper, the 90th percentile value(s) and the number of sampling sites that exceeded the action levels.

(F) For *E. coli*, the total number of E. coli-positive samples that are not special purpose samples, collected under 11.16.

(iv) For each unregulated contaminant for which the supplier must monitor, the table(s) of detected contaminants must include the average of the sample results and the range of all detected levels.

(A) The supplier may include a brief explanation of the reasons for monitoring for unregulated contaminants.

(v) The table(s) of detected contaminants must also include the likely source(s) of the contaminants to the best of the supplier's knowledge.

(A) If the supplier lacks specific information on the likely source, the supplier must include one or more of the typical sources for that contaminant listed in Table 11.34-I that is most applicable to the system.

(vi) The table(s) of detected contaminants must clearly identify any data that show a violation of any of the requirements listed below that occurred during the year covered by the CCR:

(A) MCLs.

(B) MRDLs.

(C) Treatment techniques.

(D) Monitoring and reporting of compliance data.

(E) Filtration and disinfection as specified in 11.8.

(F) Recordkeeping of compliance data.

(G) Special monitoring requirements as specified in 11.47 and 11.20.

(H) If applicable, the terms of a variance, an exemption, or an administrative or judicial order.

(vii) If a system supplies water through multiple hydraulically independent distribution systems that use different sources, the supplier should identify each separate distribution system in the CCR and should include a separate column for each independent distribution system in the table(s) of detected contaminants.

(A) Alternatively, the supplier may produce separate CCRs that only include data for each independent distribution system.

(e) Additional Content Requirements for the CCR

(i) If the supplier is required to comply with 11.11:

(A) The supplier must include all of the following information in the CCR about any significant deficiency that has not been corrected at the time of delivery of the CCR:

(I) The nature of the significant deficiency(s).

(II) The date(s) the significant deficiency(s) was identified by the Department.

(III) For each significant deficiency that was required to be addressed under 11.38(3) that has not been addressed, the Department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.

(B) The supplier must continue to include the information under 11.34(2)(e)(i)(A) each year until the Department determines that the significant deficiency was corrected under 11.38(3).

(C) If directed by the Department, the supplier must include all of the following information for any significant deficiency that was corrected before the CCR is issued:

(I) Inform the customers of the significant deficiency.

(II) How the deficiency was corrected.

(III) The date of correction.

(D) The supplier must include all of the following information in the CCR about any fecal indicator-positive groundwater source sample:

(I) The source of the fecal contamination, if the source is known.

(II) The date(s) of the fecal indicator-positive groundwater source sample(s).

(III) For each fecal indicator-positive contamination event in the groundwater source that was required to be addressed under 11.11(6)(b) that has not been addressed, the Department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.

(IV) If the fecal contamination in the groundwater source was addressed under 11.11(6), the date of such action.

(V) The applicable potential health effects language specified in Table 11.34-I for a fecal indicator-positive groundwater source sample(s) that was not invalidated by the Department.

(E) The supplier must continue to include the information specified in 11.34(2)(e)(i)(D) each year until the Department determines that the fecal contamination in the groundwater source was addressed under 11.11(6)(b).

(ii) If the supplier has nitrate sample result(s) greater than (>) 5 mg/L but less than (<) the MCL, the supplier must include a short informational statement about nitrate's effect on children.

(A) The supplier may use the following language or other Department-approved language written by the supplier:

(I) "Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider."

(iii) If the supplier has arsenic sample result(s) greater than (>) 0.005 mg/L but less than or equal to (≤) 0.010 mg/L, the supplier must include a short informational statement about arsenic.

(A) The supplier may use the following language or other Department-approved language written by the supplier:

(I) "While your drinking water meets the EPA's standard for arsenic, it does contain low levels of arsenic. The EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. The EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems."

(iv) If the supplier sampled for *Cryptosporidium* and the sample results show that *Cryptosporidium* may be present in the source water or the finished water, the supplier must include all of the following:

(A) A summary of the sample results.

(B) An explanation of the significance of the sample results.

(v) If the supplier sampled for radon and the sample results show that radon may be present in the finished water, the supplier must include all of the following:

(A) The sample results.

(B) An explanation of the significance of the sample results.

(vi) If a supplier is operating under a variance or an exemption as specified in 11.43, the supplier must include all of the following:

(A) An explanation of the reasons for the variance or exemption.

(B) The date on which the variance or exemption was issued.

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

(D) A notice of any opportunity for public input in the review or renewal, of the variance or exemption.

(vii) For surface water systems, if the supplier failed to install adequate filtration or disinfection equipment or processes, or has had a failure of such equipment or processes which are a violation as specified in 11.8, the supplier must include the following language exactly as written as part of the explanation of potential adverse health effects:

(A) "Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches."

(viii) If the supplier failed to take one or more actions for lead and copper control as specified in 11.26, the supplier must include the applicable language from Table 11.34-I.

(ix) If the supplier failed to comply with the acrylamide and epichlorohydrin certification requirements as specified in 11.21(5), the supplier must include the applicable language from Table 11.34-I.

(x) The supplier must include a clear and readily understandable explanation of any violation specified in 11.34(2)(d)(vi), including the length of the violation, any potential adverse health effects, and the actions the supplier has taken to correct the violation.

(A) To describe the potential adverse health effects, the supplier must include the applicable language from Table 11.34-I.

(xi) If the supplier has collected additional voluntary samples and the sample results show the presence of other contaminants in the finished water, the Department strongly encourages the supplier to report any sample results which may show a health concern.

(A) To determine if results may show a health concern, the Department recommends that the supplier find out if EPA has proposed a National Primary Drinking Water Regulation or has issued a health advisory for that contaminant by calling the Safe Drinking Water Hotline (800-426-4791).

(B) Detects above a proposed MCL or health advisory level show possible health concerns. For such contaminants, the Department recommends that the supplier include all of the following:

(I) The sample results.

(II) An explanation of the significance of the sample results noting the existence of a health advisory or a proposed regulation.

(xii) If a backflow prevention and cross-connection control violation occurs under 11.39(6), the supplier must include the following.

(A) The following language exactly as written:

(I) "We have an inadequate backflow prevention and cross-connection control program. Uncontrolled cross connections can lead to inadvertent contamination of the drinking water."

(B) If applicable, one or both of the following statements:

(I) We have installed or permitted an uncontrolled cross connection.

(II) We experienced a backflow contamination event.

(xiii) If the supplier is required to conduct a Level 1 assessment and/or a Level 2 assessment that is not triggered by an *E. coli* MCL violation, the supplier must include the following:

(A) The following language exactly as written:

(I) "Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments."

(B) The following applicable language for a Level 1 assessment and/or a Level 2 assessment exactly as written, providing the specific information for the text in brackets:

(I) During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(II) During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(xiv) If the supplier is required to conduct a Level 2 assessment that is triggered by an *E. coli* MCL violation, the supplier must include the following language exactly as written, providing the specific information for the text in brackets:

(A) "*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments."

(B) We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

(xv) If a treatment technique violation occurs under 11.16(11)(b)(i), the supplier must include one or both of the following statements, as applicable:

(A) During the past year we failed to conduct all of the required assessment(s).

(B) During the past year we failed to correct all identified sanitary defects that were found during the assessment.

(xvi) If an *E. coli*-positive sample has not violated the *E. coli* MCL, in addition to completing the table in 11.34(2)(d), the supplier must include a statement that explains that although they have detected *E. coli*, they are not in violation of the *E. coli* MCL.

(xvii) If an *E. coli* MCL violation occurs, in addition to completing the table in 11.34(2)(d), the supplier must include one or more of the following statements, as applicable:

(A) We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(B) We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(C) We failed to take all required repeat samples following an *E. coli*-positive routine sample.

(D) We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

(xviii) If the supplier is subject to the requirements specified in 11.14, the supplier must include the following information:

(A) A description of direct potable reuse.

(B) A description of the supplier's direct potable reuse pathogen and chemical critical control points.

(C) A description or depiction of the service area that is supplied with finished water from the direct potable reuse project.

(xix) The supplier may include additional information necessary for public education consistent with, and not detracting from, the purpose of the CCR.

11.34(3) Distribution of the CCR

(a) For a wholesale system that supplies water to a consecutive community water system(s), the wholesaler must:

(i) Distribute all the applicable information specified in 11.34(2)(a), 11.34(2)(b)(i)(A), 11.34(2)(b)(ii), 11.34(2)(c), 11.34(2)(d), 11.34(2)(e)(i), and 11.34(2)(e)(iv-xii) to the supplier responsible for the consecutive system(s) no later than either:

(A) April 1 each year.

(B) A date mutually agreed on that is included in the written contract between the suppliers.

(b) The supplier must distribute the CCR to customers no later than July 1 each year.

(i) For new systems or reclassified systems that now meet the applicability of this rule, the supplier must distribute the first CCR no later than July 1 of the year after the first full calendar year in operation.

(c) The supplier must mail or otherwise directly deliver one copy of the CCR to each customer.

(i) For systems supplying less than (<) 10,000 people, this requirement may be waived if the supplier complies with all of the following:

(A) Publishes the CCR in one or more local newspapers serving the area in which the system is located.

(B) Informs the customers that the CCR will not be mailed, either in the newspapers in which the reports are published or by other Department-approved means.

(C) The supplier makes the CCR available to the public upon request.

(ii) For systems supplying less than or equal to (≤) 500 people, the requirements specified in 11.34(3)(c)(i)(A) and 11.34(3)(c)(i)(B) may be waived if the supplier provides notice to customers at least annually that the CCR is available upon request. This notice may be distributed either by mail, door-to-door delivery, or by posting in an appropriate location.

(d) The supplier must make a good faith effort to reach consumers who are supplied by the system but are not customers (e.g. renters, workers, etc.) using methods recommended by the Department.

(i) A good faith effort to reach consumers includes a combination of methods appropriate to the system such as:

(A) Posting the reports on the Internet.

(B) Mailing to postal patrons in metropolitan areas.

(C) Advertising the availability of the report in the news media.

(D) Publication in a local newspaper.

(E) Posting in public places (e.g., cafeterias or lunch rooms of public buildings).

(F) Delivery of multiple copies for distribution by single-billed customers (e.g., apartment buildings or large private employers).

(G) Delivery to community organizations.

(e) For systems supplying greater than or equal to (≥) 100,000 people, the supplier must post the most recent CCR to a publicly accessible site on the Internet.

(f) The supplier must make the CCR available to the public upon request.

11.34(4) Reporting Requirements for the CCR

(a) No later than July 1 of each calendar year, the supplier must submit a copy of the CCR along with a Certification of Delivery to the Department.

(i) The Certification of Delivery must state that the CCR has been distributed to customers and that the information is correct and consistent with the information that the supplier previously submitted to the Department.

(ii) The supplier must also distribute the CCR to any other agency or clearinghouse as directed to by the Department.

(b) For wholesale systems, the wholesaler must submit a copy of the information provided to the supplier responsible for the consecutive system along with a Certification of Delivery to the Department no later than the date specified in 11.34(3)(a)(i).

(i) The Certification of Delivery must state that the information has been distributed to the supplier responsible for the consecutive system(s) and that the information is correct and consistent with the information that the wholesaler previously submitted to the Department.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Microbiological Contaminants						
Total coliform bacteria	TT	N/A	TT	N/A	Naturally present in the environment	Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution.
Fecal Indicators: 1) *E. coli*, 2) enterococci or 3) coliphage	TT	N/A	TT	N/A	Human and animal fecal waste	Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short- term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
E. coli	*E. coli*-positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an *E. coli*-positive routine sample, failure to collect all required repeat samples following an *E. coli*-positive routine sample, or failure to analyze a total-coliform positive repeat sample for *E. coli*.	N/A	*E. coli*-positive repeat sample following a total coliform-positive routine sample, total coliform-positive repeat sample following an *E. coli*-positive routine sample, failure to collect all required repeat samples following an *E. coli*-positive routine sample, or failure to analyze a total-coliform positive repeat sample for *E. coli*.	0	Human and animal fecal waste	*E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely-compromised immune systems.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Total organic carbon (ppm)	TT	N/A	TT	N/A	Naturally present in the environment.	Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection by products. These byproducts include trihalomethanes (TTHMs) and haloacetic acids (HAA5s). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer.
Turbidity (NTU)	TT	N/A	TT	N/A	Soil runoff.	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Disinfectant residual[2]	TT (in the distribution system)	N/A	TT (in the distribution system)	N/A	Water additive used to control microbes.	Disinfectant residual serves as one of the final barriers to protect public health. Lack of an adequate disinfectant residual may increase the likelihood that disease-causing organisms are present.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Radionuclides						
Beta/photon emitters (mrem/yr)	4 mrem/yr	N/A	4	0	Decay of natural and man-made deposits.	Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta particle and photon radioactivity in excess of the MCL over many years may have an increased risk of getting cancer.
Alpha emitters (pCi/L)	15 pCi/L	N/A	15	0	Erosion of natural deposits.	Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer.
Combined radium (pCi/L)	5 pCi/L	N/A	5	0	Erosion of natural deposits.	Some people who drink water containing radium -226 or -228 in excess of the MCL over many years may have an increased risk of getting cancer.
Uranium (µg/L)	30 µg/L	N/A	30	0	Erosion of natural deposits.	Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity.
Inorganic Chemicals						
Antimony (ppb)	0.006	1000	6	6	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder.	Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Arsenic (ppb)	0.010	1000	10[4]	0[4]	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.	Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.
Asbestos (MFL)	7 MFL	N/A	7	7	Decay of asbestos cement water mains; Erosion of natural deposits.	Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps.
Barium (ppm)	2	N/A	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.	Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure.
Beryllium (ppb)	0.004	1000	4	4	Discharge from metal refineries and coal burning factories; Discharge from electrical, aerospace, and defense industries.	Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions.
Bromate (ppb)	0.010	1000	10	0	By-product of drinking water disinfection.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Cadmium (ppb)	0.005	1000	5	5	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints.	Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Chloramines (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia.
Chlorine (ppm)	MRDL = 4	N/A	MRDL = 4	MRDLG = 4	Water additive used to control microbes.	Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort.
Chlorine dioxide (ppb)	MRDL = 0.8	1000	MRDL = 800	MRDLG = 800	Water additive used to control microbes.	Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia.
Chlorite (ppm)	1	N/A	1	0.8	By-product of drinking water disinfection.	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Chromium (ppb)	0.1	1000	100	100	Discharge from steel and pulp mills; Erosion of natural deposits.	Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis.
Copper (ppm)	AL=1.3	N/A	AL=1.3	1.3	Corrosion of household plumbing systems; Erosion of natural deposits.	Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor.
Cyanide (ppb)	0.2	1000	200	200	Discharge from steel/metal factories; Discharge from plastic and fertilizer factories.	Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid.
Fluoride (ppm)	4.0	N/A	4.0	4.0	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories.	Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorosis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Lead (ppb)	AL=0.015	1000	AL=15	0	Corrosion of household plumbing systems; Erosion of natural deposits.	Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.
Mercury (inorganic) (ppb)	0.002	1000	2	2	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland.	Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage.
Nitrate (ppm)	10	N/A	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Nitrite (ppm)	1	N/A	1	1	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.
Selenium (ppb)	0.05	1000	50	50	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines.	Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Thallium (ppb)	0.002	1000	2	0.5	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories.	Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver.
Synthetic Organic Chemicals (SOCs)						
2,4-D (ppb)	0.07	1000	70	70	Runoff from herbicide used on row crops.	Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands.
2,4,5-TP (Silvex)(ppb)	0.05	1000	50	50	Residue of banned herbicide.	Some people who drink water containing silvex in excess of the MCL over many years could experience liver problems.
Acrylamide	N/A	N/A	TT	0	Added to water during sewage/wastewater treatment.	Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer.
Alachlor (ppb)	0.002	1000	2	0	Runoff from herbicide used on row crops.	Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Atrazine (ppb)	0.003	1000	3	3	Runoff from herbicide used on row crops.	Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties.
Benzo(a)pyrene (PAH) (nanograms/L)	0.0002	1,000,000	200	0	Leaching from linings of water storage tanks and distribution lines.	Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer.
Carbofuran (ppb)	0.04	1000	40	40	Leaching of soil fumigant used on rice and alfalfa.	Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems.
Chlordane (ppb)	0.002	1000	2	0	Residue of banned termiticide.	Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer.
Dalapon (ppb)	0.2	1000	200	200	Runoff from herbicide used on rights of way.	Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes.
Di(2-ethylhexyl) adipate (ppb)	0.4	1000	400	400	Discharge from chemical factories.	Some people who drink water containing di(2-ethylhexyl) adipate well in excess of the MCL over many years could experience toxic effects, such as weight loss, liver enlargement or possible reproductive difficulties.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Di(2-ethylhexyl) phthalate (ppb)	0.006	1000	6	0	Discharge from rubber and chemical factories.	Some people who drink water containing di(2-ethylhexyl) phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer.
Dibromochloro-propane (ppt)	0.0002	1,000,000	200	0	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards.	Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer.
Dinoseb (ppb)	0.007	1000	7	7	Runoff from herbicide used on soybeans and vegetables.	Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties.
Diquat (ppb)	0.02	1000	20	20	Runoff from herbicide use.	Some people who drink water containing diquat in excess of the MCL over many years could get cataracts.
Dioxin (2,3,7,8-TCDD) (ppq)	0.00000003	1,000,000,000	30	0	Emissions from waste incineration and other combustion; discharge from chemical factories.	Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer.
Endothall (ppb)	0.1	1000	100	100	Runoff from herbicide use	Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Endrin (ppb)	0.002	1000	2	2	Residue of banned insecticide	Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems.
Epichlorohydrin	TT	N/A	TT	0	Discharge from industrial chemical factories; an impurity of some water treatment chemicals.	Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer.
Ethylene dibromide (ppt)	0.00005	1,000,000	50	0	Discharge from petroleum refineries.	Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer.
Glyphosate (ppb)	0.7	1000	700	700	Runoff from herbicide use.	Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties.
Heptachlor (ppt)	0.0004	1,000,000	400	0	Residue of banned pesticide.	Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer.
Heptachlor epoxide (ppt)	0.0002	1,000,000	200	0	Breakdown of heptachlor.	Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Hexachlorobenzene (ppb)	0.001	1000	1	0	Discharge from metal refineries and agricultural chemical factories.	Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer.
Hexachloro-cyclopentadiene (ppb)	0.05	1000	50	50	Discharge from chemical factories.	Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach.
Lindane (ppt)	0.0002	1,000,000	200	200	Runoff/leaching from insecticide used on cattle, lumber, gardens.	Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver.
Methoxychlor (ppb)	0.04	1000	40	40	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock.	Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties.
Oxamyl (Vydate) (ppb)	0.2	1000	200	200	Runoff/leaching from insecticide used on apples, potatoes and tomatoes.	Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
PCBs (Polychlorinated biphenyls) (ppt)	0.0005	1,000,000	500	0	Runoff from landfills; discharge of waste chemicals.	Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer.
Pentachloro-phenol (ppb)	0.001	1000	1	0	Discharge from wood preserving factories.	Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer.
Picloram (ppb)	0.5	1000	500	500	Herbicide runoff.	Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver.
Simazine (ppb)	0.004	1000	4	4	Herbicide runoff.	Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood.
Toxaphene (ppb)	0.003	1000	3	0	Runoff/leaching from insecticide used on cotton and cattle.	Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer.
Volatile Organic Chemicals (VOCs)						

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Benzene (ppb)	0.005	1000	5	0	Discharge from factories; leaching from gas storage tanks and landfills.	Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer.
Carbon tetrachloride (ppb)	0.005	1000	5	0	Discharge from chemical plants and other industrial activities.	Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
Chlorobenzene (ppb)	0.1	1000	100	100	Discharge from chemical and agricultural chemical factories.	Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys.
o-Dichlorobenzene (ppb)	0.6	1000	600	600	Discharge from industrial chemical factories.	Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory systems.
p-Dichlorobenzene (ppb)	0.075	1000	75	75	Discharge from industrial chemical factories.	Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood.
1,2-Dichloroethane (ppb)	0.005	1000	5	0	Discharge from Industrial chemical factories.	Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
1,1-Dichloroethylene (ppb)	0.007	1000	7	7	Discharge from industrial chemical factories.	Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver.
cis-1,2-Dichloroethylene (ppb)	0.07	1000	70	70	Discharge from industrial chemical factories.	Some people who drink water containing cis-1,2- dichloroethylene in excess of the MCL over many years could experience problems with their liver.
trans-1,2-Dichloroethylene (ppb)	0.1	1000	100	100	Discharge from industrial chemical factories.	Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver.
Dichloromethane (ppb)	0.005	1000	5	0	Discharge from pharmaceutical and chemical factories.	Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer.
1,2-Dichloropropane (ppb)	0.005	1000	5	0	Discharge from industrial chemical factories.	Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.
Ethylbenzene (ppb)	0.7	1000	700	700	Discharge from petroleum refineries.	Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Haloacetic Acids (HAA) (ppb)	0.060	1000	60	N/A	By-product of drinking water disinfection.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Styrene (ppb)	0.1	1000	100	100	Discharge from rubber and plastic factories; leaching from landfills.	Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system.
Tetrachloro-ethylene (ppb)	0.005	1000	5	0	Discharge from factories and dry cleaners.	Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.
1,2,4-Trichloro-benzene (ppb)	0.07	1000	70	70	Discharge from textile-finishing factories.	Some people who drink water containing 1,2,4- trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands.
1,1,1-Trichloroethane (ppb)	0.2	1000	200	200	Discharge from metal degreasing sites and other factories.	Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system.
1,1,2-Trichloroethane (ppb)	0.005	1000	5	3	Discharge from industrial chemical factories.	Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune systems.

TABLE 11.34-I TABLE OF REGULATED CONTAMINANTS						
Contaminant (units)	MCL (in mg/L unless otherwise noted)	To convert for CCR, multiply by	MCL in CCR units	MCLG	Major sources in drinking water	Health effects language
Trichloro-ethylene (ppb)	0.005	1000	5	0	Discharge from metal degreasing sites and other factories.	Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer.
TTHMs (Total trihalomethanes) (ppb)	0.080	1000	80	N/A	Byproduct of drinking water disinfection.	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Toluene (ppm)	1	N/A	1	1	Discharge from petroleum factories.	Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver.
Vinyl Chloride (ppb)	0.002	1000	2	0	Leaching from PVC piping; discharge from plastics factories.	Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer.
Xylenes (ppm)	10	N/A	10	10	Discharge from petroleum factories; discharge from chemical factories.	Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system.

11.35 GENERAL REPORTING REQUIREMENTS RULE

11.35(1) Applicability

For all public water systems, the supplier must comply with the reporting requirements specified in this rule.

11.35(2) General Reporting Requirements

(a) Except where a different reporting period is specified, the supplier must submit to the Department all sample results or test measurements required by the *Colorado Primary Drinking Water Regulations* no later than whichever of the following comes first:

(i) The 10th of the month following the month when the sample result(s) or test measurement(s) was received; or

(ii) The first 10 calendar days following the end of the monitoring period specified by the Department.

(b) If the State laboratory performs the analysis and submits the sample results to the Department, the supplier is not required to submit those sample results to the Department.

(c) Except where a different reporting period is specified, the supplier must report to the Department the failure to comply with any requirement of the *Colorado Primary Drinking Water Regulations*, no later than 48 hours after the failure.

(d) The supplier must notify the Department of any waterborne disease outbreak that is potentially attributable to the water system as soon as possible but no later than 24 hours after discovering the outbreak or potential outbreak.

(e) For all documentation required to be submitted under the *Colorado Primary Drinking Water Regulations*, the supplier must submit the documentation to the Department in writing unless otherwise stated.

(i) When the supplier is required to submit documentation to the Department, the supplier must submit documentation electronically or by mail to:

Colorado Department of Public Health and Environment
Water Quality Control Division
Safe Drinking Water Program
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
Fax: 303-758-1398

11.35(3) Violations for Reporting

The following constitute reporting violations:

(a) Failure to comply with any reporting requirement of this rule.

(b) Failure to comply with any reporting requirement specified elsewhere in the *Colorado Primary Drinking Water Regulations*.

11.35(4) Response to Reporting Violations

In the event of a reporting violation, the supplier must:

(a) Notify the Department no later than 48 hours after the violation occurs.

(b) Distribute Tier 3 public notice as specified in 11.33, unless otherwise specified.

11.36 RECORDKEEPING REQUIREMENTS RULE

11.36(1) Applicability

For all public water systems, the supplier must comply with the recordkeeping requirements specified in this rule.

11.36(2) Records Availability

(a) All records pertaining to the operation and water quality of a public water system are public information and the Department shall make them available to the public upon request, during normal working hours.

(b) Upon request by the Department, the supplier must submit copies of any records required to be maintained or any documents in existence, which the Department is entitled to inspect pursuant to the *Colorado Primary Drinking Water Regulations*.

11.36(3) General Recordkeeping Requirements

(a) The supplier must maintain all records required to be maintained under the *Colorado Primary Drinking Water Regulations* on the system's premises or at a convenient location near the premises.

(b) For each sample result, the supplier must either maintain the actual laboratory reports or transfer the data to tabular summaries.

(i) If the supplier maintains tabular summaries, the supplier must include all of the following information in the summaries:

(A) The date, place, and time of sample collection, and the name of the person who collected the sample.

(B) Identification of the sample type (i.e., routine distribution system sample, routine entry point sample, confirmation sample, source water or finished water sample, or a special purpose sample).

(C) Date of laboratory analysis.

(D) The name of the laboratory and the person responsible for performing the analysis.

(E) The analytical method used.

(F) The results of the analyses.

(c) Unless otherwise specified, the supplier must maintain the records of the action(s) taken to correct each violation for at least three years from the date on which the last action was taken to correct the violation.

(d) The supplier must maintain records of microbiological sample results for at least five years.

(e) The supplier must maintain records of chemical sample results for at least ten years, unless otherwise specified.

11.36(4) Additional Recordkeeping Requirements by Rule

(a) Recordkeeping Requirements for Monitoring Plans

For each sample result, the supplier must maintain the monitoring plan specified in 11.5 under which the sample was collected for the same time period that the sample result is required to be maintained.

(b) Recordkeeping Requirements for the Surface Water Treatment Rules

(i) The supplier must maintain all of the following information for at least three years:

(A) The results of individual filter monitoring collected under 11.8(2)(g).

(B) Any notification to the Department that the supplier will not conduct source water monitoring due to meeting the criteria specified in 11.10(2)(a)(v).

(C) The results of treatment monitoring associated with microbial toolbox options collected under 11.10(5)(b) through 11.10(5)(o), as applicable.

(ii) The supplier must maintain all of the following information for at least three years after bin classification under 11.10(3)(b):

(A) The initial round of source water monitoring results collected under 11.10(2).

(B) The second round of source water monitoring results collected under 11.10(2).

(iii) The supplier must maintain the records of turbidity sample results collected under 11.8 for at least five years.

(iv) The supplier must maintain the following recycle flow information:

(A) A copy of the recycle notification and information submitted to the Department under 11.9(4).

(B) A list of all recycle flows and the frequency with which they are returned.

(C) The average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

(D) The typical filter run length and a written summary of how filter run length is determined.

(E) The type of treatment provided for the recycle flow.

(F) Data on the physical dimensions of the equalization and/or treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used and average dose and frequency of use, and frequency at which solids are removed, if applicable.

(v) The supplier must maintain all of the following information indefinitely:

(A) The results of the disinfection profile, including raw data and analysis, specified in 11.8(4).

(B) The results of the disinfection benchmark, including raw data and analysis, specified in 11.8(5).

(c) Recordkeeping Requirements for the Groundwater Rules

(i) The supplier must maintain all of the following information for at least five years:

(A) For each minimum residual disinfection concentration treatment technique requirement sample collected under 11.11(2)(c):

(I) The date, place, and time of sample collection, and the name of the person(s) who collected and analyzed the sample;

(II) The analytical technique/method used; and

(III) The results of the analyses.

(B) Documentation specified in 11.11(2)(e)(i)(C) relating to any entry point minimum disinfection treatment technique violation.

(C) For systems operating under a disinfection waiver under 11.13, all records of all chlorination activities including:

(I) The date, duration, locations and purpose of each chlorination event; and

(II) The maximum and minimum chlorine dose in mg/L the supplier applied during each chlorination event and the results of any and all residual disinfectant concentration results collected during each chlorination event.

(D) Records of decisions that a total coliform-positive sample result meets Department criteria for distribution system conditions that cause total coliform-positive sample results under 11.11(4)(a)(ii)(B).

(E) Records of invalidation of fecal indicator-positive groundwater source samples under 11.11(4)(e)(i).

(F) For consecutive systems, documentation of notification to wholesalers of total-coliform positive samples specified in 11.11(4)(c)(i) that are not invalidated under 11.16(7).

(G) For systems that provide 4-log treatment of viruses using chemical disinfection and are required to comply with the requirements specified in 11.11(3):

(I) Records of the lowest daily residual disinfectant concentration; and

(II) Records of the date and duration of any failure to maintain the Department-specified minimum residual disinfectant concentration for a period of more than four hours.

(H) For systems that provide 4-log treatment of viruses using alternative treatment methods and are required to comply with 11.11(3):

(I) Records of Department-specified parameters for approved alternative treatment; and

(II) Records of the date and duration of any failure to meet the alternative treatment operating requirements for a period of more than four hours.

(ii) The supplier must maintain all of the following information for at least 10 years:

(A) For all systems that provide 4-log treatment of viruses that are required comply with 11.11(3), records of the Department-approved minimum residual disinfectant concentration.

(B) Documentation of corrective actions required in response to fecal indicator positive triggered source water monitoring sample results under 11.11(6).

(iii) For a system operating under a disinfection waiver, the supplier must maintain records of all correspondence and documentation relating to the requirements specified in 11.13 for as long as the system is operating under the disinfection waiver and for at least five years after waiver withdrawal.

(d) Recordkeeping Requirements for the Revised Total Coliform Rule

(i) The supplier must maintain all of the following information for at least five years after completion of the assessment or corrective action:

(A) Completed assessment forms, regardless of who conducts the assessment.

(B) Documentation of corrective actions completed as a result of those assessments.

(C) Available summary documentation of the sanitary defects and corrective actions as specified in 11.16(9).

(ii) If the supplier collects special purpose samples, the supplier must keep *E. coli*-positive sample results that are representative of water throughout the distribution system and a summary of any related follow-up activities on file for Department review for at least five years.

(iii) If the Department grants an extension to the 24-hour limit for collecting repeat samples, as specified in 11.16(5), the supplier must maintain a record of the repeat sample results for at least five years.

(e) Recordkeeping Requirements for the Disinfection Byproducts Rule

(i) If the supplier was required to complete an IDSE report, the supplier must maintain a complete copy of the IDSE report for at least 10 years after the date that the report was submitted.

(A) If the Department modified the supplier's sampling requirements that were in the system's IDSE report or if the Department approved alternative sampling locations, the supplier must keep a copy of the Department's notification on file for 10 years after the date of the Department's notification.

(B) The supplier must make the IDSE report and any Department notification available for review by the Department or the public.

(ii) If the supplier submitted a 40/30 certification, the supplier must maintain a complete copy of the 40/30 certification for at least 10 years after the date that the certification was submitted.

(A) "40/30 CERTIFICATION" means a historical requirement where the supplier certified to the Department that every individual sample result collected during eight consecutive quarters was less than or equal to (≤) 0.040 mg/L for TTHM and less than or equal to (≤) 0.030 mg/L for HAA5 and no TTHM or HAA5 violations occurred during that time.

(B) The supplier must make the 40/30 certification and any Department notification available for review by the Department or the public.

(f) Recordkeeping Requirements for the Lead and Copper Rule

The supplier must maintain the original records of all sample results and analyses, reports, surveys, letters, evaluations, schedules, Department determinations, and any other information required by 11.26 for at least 12 years.

(g) Recordkeeping Requirements for the Storage Tank Rule

For each completed inspection, the supplier must maintain the inspection summary required by 11.28(3)(f) for at least ten years.

(h) Recordkeeping Requirements for the Public Notification Rule

The supplier must maintain copies of each public notice and certification made to the Department under 11.33 for at least three years after issuance.

(i) Recordkeeping Requirements for the Consumer Confidence Report (CCR) Rule

The supplier must retain copies of each CCR required by 11.34 for at least three years after issuance.

(j) Recordkeeping Requirements for the Cross-Connection Control Rule

The supplier must maintain all control device maintenance records under 11.37 for at least three years.

(k) Recordkeeping Requirements for the Sanitary Survey Rule

(i) The supplier must maintain all of the following information regarding sanitary surveys conducted under 11.38 for at least 10 years:

(A) Copies of any written reports, summaries or communications relating to sanitary surveys of the system conducted by the system itself, a private consultant, or a local, state or federal agency.

(B) Documentation of corrective actions required in response to significant deficiencies and/or violations identified on a sanitary survey under 11.38(3).

(l) Recordkeeping Requirements for the Backflow Prevention and Cross-Connection Control Rule

(i) The supplier must maintain all backflow prevention assembly and backflow prevention method testing, inspection, and maintenance records:

(A) For community water systems, for at least three years.

(B) For non-community water systems, for at least five years.

(ii) The supplier must maintain each annual backflow prevention and cross-connection control program report developed:

(A) For community water systems, for at least three years.

(B) For non-community water systems, for at least five years.

(m) Recordkeeping Requirements for the Water Hauler Rule

(i) The supplier must maintain all of the following information for at least five years for each tank or container:

(A) The date, time, and location of each water loading station used.

(B) The date, time, and location of each water delivery.

(C) The date, time, and result of each residual disinfectant concentration sample collected under 11.41(2)(b).

(D) The date, time, type and quantity of any chemical added to the tank or container containing water intended for delivery.

(E) A maintenance record for all hose materials, hose containers, pumps, fittings and tank and/or container including the date, time and method of cleaning and/or disinfection.

(n) Recordkeeping Requirements for the Variances and Exemptions Rule

The supplier must maintain records concerning a variance or exemption granted under 11.43 for at least five years after the expiration of the variance or exemption.

11.37 RESERVED

11.38 SANITARY SURVEY RULE

11.38(1) Applicability and Definitions

(a) For all public water systems, the supplier must comply with the requirements specified in this rule.

(b) “SANITARY SURVEY” means an onsite review of a system's adequacy in producing and distributing safe drinking water. The review will include, but is not limited to, all of the following eight components and the related operation and maintenance practices of each:

(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.

(viii) Supplier compliance with all requirements of the *Colorado Primary Drinking Water Regulations*, Regulation 100, Water and Wastewater Facility Operators Certification Requirements, and any other Department-mandated requirements.

11.38(2) Sanitary Survey Requirements

(a) Sanitary surveys must be performed by the Department or by a Department-approved third party.

(b) The supplier must ensure that sanitary surveys are performed at the following frequencies:

(i) For non-community water systems, at least every five years.

(ii) For community water systems, at least every three years.

(A) The Department may reduce the frequency of sanitary surveys to no less frequently than every five years if the supplier meets all of the following:

(I) Provides 4-log treatment of viruses for all sources.

(II) Has an outstanding performance record, as determined by the Department and documented in previous sanitary surveys.

(III) Has had no total coliform MCL violations or total coliform monitoring violations since the last sanitary survey.

(c) At the Department's request, the supplier must provide the Department with any information that will enable the Department or Department-approved third party to conduct a sanitary survey.

11.38(3) Requirements for Corrective Action for Significant Deficiencies (<u>Treatment Technique Requirement</u>) or Violations Identified During a Sanitary Survey

(a) If a significant deficiency or violation is identified during a sanitary survey, the supplier must implement corrective action as specified in this section, 11.38(3).

(i) For groundwater systems with significant deficiencies, the supplier must implement one or more of the following corrective actions:

(A) Correct all significant deficiencies.

(B) Provide an alternative source of water.

(C) Eliminate the source of contamination.

(D) Provide treatment that reliably achieves at least 4-log treatment of viruses at the Department-approved location for the groundwater source.

(ii) For groundwater systems with significant deficiencies, the Department may specify which corrective action specified in 11.38(3)(a)(i)(A-D) that the supplier must implement.

(iii) The supplier must implement corrective action as approved by the Department for:

(A) Surface water systems with significant deficiencies; and

(B) All systems with violations.

(b) The Department may specify interim measures, at any time, pending completion of corrective action to protect public health.

(c) No later than 30 days after receiving written notice of significant deficiencies and/or violations, the supplier must consult with the Department regarding the appropriate corrective action and schedule, unless the Department specifies which corrective action the supplier must implement.

(d) No later than 45 days after receiving written notice of significant deficiencies and/or violations, the supplier must submit a written corrective action plan to the Department for approval.

(i) The corrective action plan must include the actions the supplier will take to address the significant deficiencies and/or violations and a proposed schedule for completing the actions.

(e) Any changes the supplier makes to a Department-approved corrective action plan and schedule must be approved by the Department.

(f) No later than 120 days, or earlier if required by the Department, after receiving written notice of significant deficiencies and/or violations the supplier must either:

(i) Have completed the Department-approved corrective action plan including any Department-specified interim measures; or

(ii) Be in compliance with the Department-approved corrective action plan and schedule including any Department-specified interim measures.

(g) No later than 30 days after completing any corrective action under 11.38(3), the supplier must notify the Department of the completed corrective action.

11.38(4) Treatment Technique Violation and Response for Corrective Action

(a) If the supplier fails to comply with the requirements specified in 11.38(3) for a significant deficiency, a corrective action treatment technique violation occurs.

(b) In the event of a corrective action treatment technique violation, the supplier must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 2 public notice as specified in 11.33.

11.38(5) Special Public Notice Requirements

(a) For non-community groundwater systems, if the supplier fails to complete corrective action for significant deficiencies, under 11.38(3), within one year of receiving written notice of significant deficiency, or earlier if required by the Department, the supplier must distribute special public notice to inform consumers of the uncorrected significant deficiency.

(i) The special public notice must include all of the following:

(A) The nature of the significant deficiency and the date the significant deficiency was identified by the Department.

(B) The Department-approved plan and schedule for corrective action, including interim measures, progress to date, and any interim measures completed.

(C) For systems supplying a large proportion of non-English speaking consumers, as determined by the Department, the supplier must include one or more of the following:

(I) Information in the appropriate language(s) regarding the importance of the special public notice.

(II) A telephone number or address where the consumer may contact the supplier to obtain a translated copy of the special public notice or request assistance in the appropriate language.

(ii) The supplier must redistribute the special public notice annually until the significant deficiency is corrected.

(b) For non-community water systems with significant deficiencies that have been corrected, if required by the Department, the supplier must distribute special public notice to inform consumers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction.

11.39 BACKFLOW PREVENTION AND CROSS-CONNECTION CONTROL RULE

11.39(1) Applicability and Definitions

(a) All public water systems must comply with the requirements specified in this rule.

(b) “ACTIVE DATE” means the first day that a backflow prevention assembly or backflow prevention method is used to control a cross connection in each calendar year.

(c) “BACKFLOW” means the reverse flow of water, fluid, or gas caused by back pressure or back siphonage.

(d) “BACKFLOW PREVENTION ASSEMBLY” means any mechanical assembly installed at a water service line or at a plumbing fixture to prevent a backflow contamination event, provided that the mechanical assembly is appropriate for the identified contaminant at the cross connection and is an in-line field-testable assembly.

(e) “BACKFLOW PREVENTION ASSEMBLY ANNUAL TESTING COMPLIANCE RATIO” means the number of backflow prevention assemblies tested during the calendar year divided by the number of backflow prevention assemblies installed at a cross connection that were used during the calendar year.

(f) "BACKFLOW PREVENTION METHOD" means any method and/or non-testable device installed at a water service line or at a plumbing fixture to prevent a backflow contamination event, provided that the method or non-testable device is appropriate for the identified contaminant at the cross connection.

(g) "BACKFLOW PREVENTION METHOD ANNUAL INSPECTION COMPLIANCE RATIO" means the number of backflow prevention methods inspected during the calendar year divided by the number of backflow prevention methods installed at a cross connection that were used during the calendar year.

(h) "CERTIFIED CROSS-CONNECTION CONTROL TECHNICIAN" means a person who possesses a valid Backflow Prevention Assembly Tester certification from one of the following approved organizations: American Society of Sanitary Engineering (ASSE) or the American Backflow Prevention Association (ABPA). If a certification has expired, the certification is invalid.

(i) "CONTROLLED" means having a properly installed, maintained, and tested or inspected backflow prevention assembly or backflow prevention method that prevents backflow through a cross connection.

(j) "SINGLE-FAMILY-RESIDENTIAL" means:

(i) A single living unit that is supplied by its own separate service line; or

(ii) Multiple living units where each individual living unit is supplied by a separate service line; or

(iii) Two separate single living units supplied by a common service line.

(k) "SURVEY COMPLIANCE RATIO" means the total number of connections surveyed, including the number of all non-single-family-residential connections to the public water system with the most protective backflow prevention assembly or method that was not surveyed as specified in 11.39(2)(c), divided by the total number of non-single-family-residential connections to the public water system and connections within the supplier's waterworks.

(i) The supplier is not required to include any non-single-family-residential connections identified after October 31 of the calendar year in the total number of non-single-family-residential connections to the public water system until the following calendar year.

(l) "UNCONTROLLED" means not having a properly installed and maintained and tested or inspected backflow prevention assembly or backflow prevention method, or the backflow prevention assembly or backflow prevention method does not prevent backflow through a cross connection.

11.39(2) Backflow Prevention and Cross-Connection Control Program Requirements

(a) The supplier must develop a written backflow prevention and cross-connection control program. The written backflow prevention and cross-connection control program must include all of the following:

(i) The supplier's process for conducting surveys.

(ii) The supplier's legal authority to perform a survey of a customer's property to determine whether a cross connection is present unless the supplier controls all non-single-family-residential connections to the public water system with the most protective backflow prevention assembly or backflow prevention method.

(iii) The process the supplier will use to select a backflow prevention assembly or backflow prevention method to control a cross connection.

(iv) The supplier's legal authority to install, maintain, test, and inspect backflow prevention assemblies and/or backflow prevention methods and/or require customers to install, maintain, test, and inspect backflow prevention assemblies and/or backflow prevention methods.

(v) The process the supplier will use to track the installation, maintenance, testing, and inspection of all backflow prevention assemblies and backflow prevention methods used to control cross connections.

(vi) The process the supplier will use to ensure backflow prevention assemblies are tested by a Certified Cross-Connection Control Technician.

(b) The Department may review and revise the written backflow prevention and cross-connection control program.

(c) The supplier must survey all non-single-family-residential connections to the public water system to determine if the connection is a cross connection unless the supplier controls that connection with the most protective backflow prevention assembly or backflow prevention method. The supplier must survey all connections within the supplier's waterworks to determine if the connection is a cross connection.

(i) If the supplier identifies a cross connection during a survey, the supplier must determine the type of backflow prevention assembly or backflow prevention method to control the cross connection.

(ii) If the supplier becomes aware of a single-family-residential connection to the public water system that is a cross connection, the supplier must determine the type of backflow prevention assembly or backflow prevention method to control the cross connection.

(iii) The supplier must achieve the survey compliance ratios as specified in Table 11.39-I.

TABLE 11.39-I Survey Compliance Ratio

Compliance Date	Compliance Ratio
By December 31, 2016	Greater than 0.60
By December 31, 2017	Greater than 0.70
By December 31, 2018	Greater than 0.80
By December 31, 2019	Greater than 0.90
By December 31, 2020	Greater than 0.90
By December 31, 2021 and each year after	1.0

(iv) The supplier may apply to the Department for alternative survey compliance ratios specified in Table 11.39-I.

(A) In the application, the supplier must include all of the following information:

(I) An explanation of why the supplier is unable to comply with the survey compliance ratios specified in Table 11.39-I.

(II) The proposed alternative survey compliance ratios for the compliance dates specified in Table 11.39-I.

(a) The proposed alternative survey compliance ratios must meet the survey compliance ratio of 1.0 within a timeline specified by the department.

(III) A discussion of the supplier's strategy to achieve the proposed alternative survey compliance ratios and the survey compliance ratio of 1.0 within a timeline specified by the department.

(B) If the supplier receives written Department-approval for alternative survey compliance ratios, the supplier must comply with any Department-specified requirements in the approval.

11.39(3) Treatment Technique Requirements for the Control of Cross Connections

(a) If the supplier learns of a suspected or confirmed backflow contamination event, the supplier must notify and consult with the Department on any appropriate corrective measures no later than 24 hours after learning of the backflow contamination event.

(b) The supplier is prohibited from installing or permitting any uncontrolled cross connection to the distribution system or within the supplier's waterworks.

(c) If the supplier discovers an uncontrolled cross connection and a suspected or confirmed backflow contamination event has not occurred, the supplier must:

(i) No later than 120 days after its discovery, install and maintain or require the customer to install and maintain a backflow prevention assembly or backflow prevention method at the uncontrolled cross connection, suspend service to the customer, or remove the cross connection.

(A) If the supplier is unable to meet the 120-day deadline, the supplier must consult with the Department and the Department may approve an alternative schedule.

(B) The supplier can either control cross connections discovered within a customer's water system by containment or containment by isolation.

(I) "CONTAINMENT" means the installation of a backflow prevention assembly or a backflow prevention method at any connection to the public water system that supplies an auxiliary water system, location, facility, or area such that backflow from a cross connection into the public water system is prevented.

(II) "CONTAINMENT BY ISOLATION" means the installation of backflow prevention assemblies or backflow prevention methods at all cross connections identified within a customer's water system such that backflow from a cross connection into the public water system is prevented.

(C) The supplier must ensure that all installed backflow prevention assemblies used to control cross connections are tested by a Certified Cross-Connection Control Technician upon installation.

(D) The supplier must ensure that all installed backflow prevention methods used to control cross connections are inspected by the supplier or a Certified Cross-Connection Control Technician upon installation.

(d) The supplier must ensure that backflow prevention assemblies used to control cross connections are tested annually by a Certified Cross-Connection Control Technician and maintained. The supplier must achieve the backflow prevention assembly annual testing compliance ratios as specified in Table 11.39-II.

TABLE 11.39-II Backflow Prevention Assembly Annual Testing Compliance Ratio	
Compliance Date	Annual Compliance Ratio
By December 31, 2016	Greater than 0.50
By December 31, 2017	Greater than 0.60
By December 31, 2018	Greater than 0.70
By December 31, 2019	Greater than 0.80
By December 31, 2020	Greater than 0.80
By December 31, 2021 and each year after	Greater than 0.90

(i) No later than 120 days after the supplier is notified of a failed test, the supplier must ensure that the backflow prevention assembly that produced the failed test is repaired or replaced and tested, service is suspended to the customer, or the cross connection is removed.

(A) If the supplier is unable to meet the 120-day deadline, the supplier must consult with the Department and the Department may approve an alternative schedule.

(ii) Beginning January 1, 2022, for each backflow prevention assembly not tested during the previous calendar year, the supplier must ensure the backflow prevention assembly is tested no later than 90 days after the active date of the backflow prevention assembly in the following calendar year.

(A) If the supplier is unable to meet the 90-day deadline, the supplier must consult with the Department and the Department may approve an alternative schedule.

(e) The supplier must ensure that backflow prevention methods used to control cross connections are inspected annually by the supplier or a Certified Cross-Connection Control Technician and maintained. The supplier must achieve a backflow prevention method annual inspection compliance ratio of greater than (>) 0.90.

(i) No later than 120 days after the supplier is notified of an inadequate backflow prevention method, the supplier must ensure that the inadequate backflow prevention method is repaired or replaced, service is suspended to the customer, or the cross connection is removed.

(A) If the supplier is unable to meet the 120-day deadline, the supplier must consult with the Department and the Department may approve an alternative schedule.

(ii) Beginning January 1, 2017, for each backflow prevention method not inspected during the previous calendar year, the supplier must ensure the backflow prevention method is inspected no later than 90 days after the active date of the backflow prevention method in the following calendar year.

(A) If the supplier is unable to meet the 90-day deadline, the supplier must consult with the Department and the Department may approve an alternative schedule.

(f) The supplier must control or remove any uncontrolled cross connection or ensure that any cross connection is controlled no later than 10 days after being ordered in writing by the Department.

11.39(4) Backflow Prevention and Cross-Connection Control Program Annual Written Report

(a) Beginning in 2017, the supplier must develop a written backflow prevention and cross-connection control program report for the previous calendar year that includes all of the following information:

(i) Total number of non-single-family-residential connections to the public water system and connections within the supplier's waterworks.

(A) The supplier is not required to include any non-single-family-residential connections identified after October 31 of the calendar year in the total number of non-single-family-residential connections to the public water system until the following calendar year.

(ii) Total number of connections surveyed to determine if cross connections are present.

(iii) Survey compliance ratio.

(iv) Total number of identified cross connections.

(v) Number of uncontrolled cross connections identified during the calendar year.

(A) Number of identified uncontrolled cross connections that were controlled within 120 days of discovery.

(B) Number of identified uncontrolled cross connections that were not controlled within 120 days of discovery.

(vi) Number of backflow prevention assemblies installed at cross connections that were used during the calendar year.

(vii) Number of backflow prevention methods installed at cross connections that were used during the calendar year.

(viii) Number of connections where service was suspended as specified in 11.39(3) during the calendar year.

(ix) Number of backflow prevention assemblies used to control cross connections that were tested by a Certified Cross Connection Control Technician during the calendar year.

(x) Backflow prevention assembly annual testing compliance ratio.

(xi) Beginning January 1, 2021, the number and location of backflow prevention assemblies not tested during the calendar year covered by the report.

(xii) Number of backflow prevention methods used to control cross connections that were inspected during the calendar year.

(xiii) Backflow prevention method annual inspection compliance ratio.

(xiv) Beginning January 1, 2017, the number and location of backflow prevention methods not inspected during the calendar year covered by the report.

(b) For each calendar year, the supplier must complete the annual backflow prevention and cross-connection control program report no later than May 1 of the following calendar year.

11.39(5) Compliance Determinations for Backflow Prevention and Cross-Connection Control

(a) Compliance with the survey treatment technique requirement is based on the survey compliance ratio.

(i) The supplier is not required to include any non-single-family-residential connections identified after October 31 of the calendar year in the total number of non-single-family-residential connections to the public water system until the following calendar year.

(b) Compliance with the backflow prevention assembly testing treatment technique requirement is based on the backflow prevention assembly annual testing compliance ratio.

(c) Compliance with the backflow prevention method inspection treatment technique requirement is based on the backflow prevention method annual inspection compliance ratio.

11.39(6) Violations for Backflow Prevention and Cross-Connection Control

(a) The following constitute backflow prevention and cross-connection control treatment technique violations:

(i) The supplier fails to notify the Department of any suspected or confirmed backflow contamination event as specified in 11.39(3)(a).

(ii) The supplier installs or permits an uncontrolled cross connection.

(iii) The supplier discovers an uncontrolled cross connection and fails to comply with the requirements specified in 11.39(3)(c).

(iv) The supplier fails to achieve the annual backflow prevention assembly testing compliance ratio specified in 11.39(3)(d).

(v) The supplier fails to comply with the backflow prevention assembly failed test requirements specified in 11.39(3)(d)(i).

(vi) The supplier fails to comply with the backflow prevention assembly testing requirements specified in 11.39(3)(d)(ii).

(vii) The supplier fails to achieve the backflow prevention method inspection compliance ratio specified in 11.39(3)(e).

(viii) The supplier fails to comply with the backflow prevention method inadequate method requirements specified in 11.39(3)(e)(i).

(ix) The supplier fails to comply with the backflow prevention method inspection requirements specified in 11.39(3)(e)(ii).

(x) The supplier fails to comply with a written order from the Department specified in 11.39(3)(f).

(b) The following constitute backflow prevention and cross-connection control violations:

(i) The supplier fails to develop or implement a written backflow prevention and cross-connection control program as specified in 11.39(2).

(ii) The supplier fails to achieve the survey compliance ratio specified in 11.39(2)(c) or the Department-approved alternative survey compliance ratios.

(iii) The supplier fails to complete an annual backflow prevention and cross-connection control program report as specified in 11.39(4).

11.39(7) Response to Violations for Backflow Prevention and Cross-Connection Control

(a) In the event of a backflow prevention and cross-connection control treatment technique violation, the supplier must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 2 public notice as specified in 11.33.

(b) In the event of a backflow prevention and cross-connection control violation, the supplier must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 3 public notice as specified in 11.33.

11.40 RESERVED

11.41 WATER HAULER RULE

11.41(1) Applicability and Definitions

(a) For a public water system that hauls water, the water hauler must comply with the requirements specified in this rule in addition to other applicable requirements of the *Colorado Primary Drinking Water Regulations*.

(b) The water hauler is a supplier and means any person that owns or operates a public water system that hauls water.

11.41(2) Treatment Technique and Monitoring Requirements for Public Water Systems That Haul Water

(a) The water hauler must operate in accordance with a Department-approved operational plan.

(i) The water hauler must either submit an operational plan for Department approval or use the pre-approved operational plan in the Department's *Operational Handbook for a Colorado Public Water System That Hauls Water*.

(b) In addition to the applicable residual disinfectant concentration monitoring requirements specified in 11.8, 11.11 and 11.23, on each day a tank or container is used to deliver water, the water hauler must monitor the residual disinfectant concentration of the water dispensed from each tank or container at least once.

(i) If the water hauler uses more than one water loading station per day, the water hauler must also monitor the residual disinfectant concentration of the water dispensed from the tank or container at least once for each water loading station used.

11.41(3) Treatment Technique Violation and Response for the Water Hauler Rule

(a) If the water hauler fails to operate in accordance with a Department-approved operational plan, a treatment technique violation occurs.

(b) In the event of a treatment technique violation, the water hauler must:

(i) Notify the Department no later than 48 hours after the violation occurs.

(ii) Distribute Tier 2 public notice as specified in 11.33.

11.42 WHOLESALE, CONSECUTIVE, AND INTEGRATED SYSTEMS RULE

11.42(1) Definitions

"INTEGRATED SYSTEM" means a system that consists of a wholesale system and one or more consecutive system(s) with distribution systems that are physically connected, where the wholesaler has assumed responsibility for compliance with one or more of the regulatory requirements applicable to the supplier responsible for the consecutive system.

11.42(2) Wholesale Systems

For wholesale systems, the wholesaler is responsible for complying with all of the applicable requirements of the *Colorado Primary Drinking Water Regulations* up to the point where treated drinking water from the wholesale system enters a consecutive system.

(a) The wholesaler may, as specified in 11.42(4), accept responsibility for compliance with regulatory requirements that would otherwise apply to a consecutive system.

11.42(3) Consecutive Systems

(a) Monitoring and Reporting Requirements

(i) For consecutive systems, the supplier responsible for the consecutive system must comply with all applicable monitoring and reporting requirements of the *Colorado Primary Drinking Water Regulations*.

(A) If the consecutive system is a part of an integrated system, as specified in 11.42(4), the supplier responsible for the consecutive system is not required to comply with the monitoring and reporting requirements for which the wholesaler has assumed responsibility.

(b) Applicable MCLs and Other Requirements

(i) For consecutive systems, unless exempted from the monitoring requirements specified in 11.42(3)(a), the supplier responsible for the consecutive system must comply with all applicable MCLs and other requirements of the *Colorado Primary Drinking Water Regulations*.

(A) If the consecutive system is a part of an integrated system, as specified in 11.42(4), the supplier responsible for the consecutive system is not required to comply with the MCLs and other applicable requirements for which the wholesaler has assumed responsibility.

(ii) For consecutive systems, the supplier responsible for the consecutive system must, while not a requirement of these regulations, comply with the applicable requirements of Regulation 100, the Water and Wastewater Facility Operators Certification Requirements.

(A) If the consecutive system is a part of an integrated system, as specified in 11.42(4), the supplier responsible for the consecutive system is not required to comply with the requirements of Regulation 100 because the wholesaler assumes the responsibility. If the wholesaler assumes the responsibility for the requirements of Regulation 100, the wholesaler has therefore become the operator in responsible charge for the distribution system of the consecutive system.

11.42(4) Integrated Systems

(a) A wholesale system and one or more consecutive systems with distribution systems that are physically connected may choose to operate in a manner where the wholesaler assumes responsibility for compliance with one or more regulatory requirements applicable to the supplier responsible for the consecutive system, if the requirements of this section, 11.42(4), are met.

(b) Eligibility for Becoming an Integrated System

(i) Consecutive systems that receive finished water, through purchase or other means, from a wholesale system and that distribute only that water through a distribution system that the consecutive system owns are eligible for integrated system status with the wholesale system.

(ii) A consecutive system is not eligible for integrated system status if:

(A) The supplier responsible for the consecutive system provides any treatment other than disinfection; or

(B) The supplier responsible for the consecutive system is required to comply with additional or more stringent monitoring requirements or MCLs than the wholesaler.

(iii) An integrated system may be established by the wholesaler in cooperation with the supplier(s) responsible for the participating consecutive system(s) with Department approval.

(A) The wholesaler must establish requirements for the supplier(s) responsible for the participating consecutive system(s) in a contract, memorandum of agreement, or other enforceable mechanism.

(B) The decision to accept a consecutive system in the integrated system is at the discretion of the wholesaler with Department approval, except where required under Colorado law, and cannot be appealed.

(c) Application Requirements for Integrated System Approval

(i) To establish an integrated system, the suppliers must submit a joint application for Department approval that includes all of the following information:

(A) For the wholesale system and each consecutive system that intends to participate:

(I) The contact person, mailing address, and phone number.

(II) The number of people supplied by the system.

(B) Each regulatory requirement for which the integrated system is being created.

(C) Whether the consecutive system(s) provides disinfection.

(D) A map showing the distribution systems of the wholesale system and each consecutive system including the following elements: meters, lines 16 inches in diameter or larger, pump stations, storage tanks, and finished water reservoirs.

(E) A sampling plan for each regulatory requirement that the integrated system is assuming responsibility for.

(I) The sampling plan must meet all requirements specified in 11.5 and identify the responsibilities of each party.

(F) A copy of the agreement between the wholesaler and the supplier(s) responsible for the consecutive system(s) that includes the common set of operation and maintenance standards that the wholesaler has established for each regulatory requirement covered by the integrated system.

(G) A statement that clearly assigns legal responsibility for compliance with each regulatory requirement to the supplier of one of the participating systems in the integrated system.

(d) Integrated System Approval and Modification

(i) If an application submitted to the Department is incomplete, the Department shall advise the supplier(s) of items needed to complete the application no later than 90 days after receiving the application.

(ii) No later than 150 days after receiving a complete application, the Department shall approve or deny the application for an integrated system and provide a rationale for the action taken.

(A) If the Department denies the request for a new or modified integrated system, the supplier(s) may contest the denial by requesting a hearing.

(I) Requests for a hearing must:

(a) Be filed in writing with the Department no later than 30 days after service of the statement of denial.

(b) State the grounds on which the denial is being contested.

(c) State the amount of time the supplier(s) estimates will be required for the hearing.

(II) The hearing regarding the denial shall be held in accordance with applicable provisions of Article 4 of Title 24, Colorado Revised Statutes.

(iii) If an integrated system proposes adding a new consecutive system to the integrated system, the wholesaler and supplier responsible for the new consecutive system must provide 30 days notice to the Department before the agreement goes into effect.

(A) The notice must be signed by the wholesaler and the supplier responsible for the consecutive system.

(B) The notice must include a revised sampling plan(s) and map consistent with the requirements specified in 11.42(4)(c).

(C) The addition of the new consecutive system shall be automatically approved, unless the Department notifies the wholesaler of specific concerns with the revised sampling plan(s) no later than 45 days after receiving the proposal.

(iv) Until an integrated system is approved, the supplier responsible for each consecutive system is responsible for compliance with all regulatory requirements as specified in 11.42(2) and 11.42(3).

(e) Removal of a Consecutive System from the Integrated System

(i) The wholesaler may remove a consecutive system from the integrated system if the supplier responsible for the consecutive system and the Department are given at least 30 days notice before the removal goes into effect.

(A) The notice must include the cause for the removal of the consecutive system from the integrated system.

(B) Within the 30-day period, the Department may, through written notice to the wholesaler, intervene in an attempt to resolve the issue(s) between the two systems.

(I) If the Department intervenes, the 30-day notice period to remove the consecutive system shall be extended to 90 days.

(ii) The Department shall notify the wholesaler of any deficiencies, regulatory or otherwise, that are identified in the sanitary survey for the distribution system of a consecutive system.

(f) Separation of a Consecutive System from an Integrated System

If the supplier responsible for the consecutive system voluntarily separates from an integrated system, the supplier responsible for the consecutive system must immediately notify the Department of the date of separation and the regulatory requirement(s) for which the consecutive system reassumes responsibility.

(g) Dissolution of an Integrated System

(i) The Department may revoke the approval of an integrated system after providing 30 days notice to the wholesaler and the supplier(s) responsible for any affected consecutive system(s).

(A) If the Department revokes the approval of an integrated system, the supplier(s) may request a hearing to contest the revocation. Upon appeal, the supplier(s) may request the Department to grant a stay until the administrative decision is rendered on the appeal.

(I) Requests for a hearing must:

(a) Be filed in writing with the Department no later than 30 days after service of the statement of revocation.

(b) State the grounds on which the revocation is being contested.

(c) State the amount of time the supplier(s) estimates will be required for the hearing.

(II) The hearing regarding the revocation shall be held in accordance with applicable provisions of Article 4 of Title 24, Colorado Revised Statutes.

11.43 VARIANCES AND EXEMPTIONS RULE

11.43(1) Applicability and Definitions

(a) For all public water systems, the supplier may apply for a variance or exemption as specified in this rule.

(b) "EXEMPTION" means the supplier is temporarily not required to comply with an MCL or treatment technique. The Department may grant an exemption if the supplier meets the requirements specified in 11.43(4).

(c) "SMALL SYSTEM VARIANCE" means a variance from an MCL or treatment technique for systems that supply less than (<) 10,000 people and meet the requirements specified in 11.43(3).

(d) "SMALL SYSTEM VARIANCE TECHNOLOGY" means a specific treatment or treatment technology that the EPA has identified for use by small systems that are otherwise unable to afford to comply with the *National Primary Drinking Water Regulations*.

(e) "VARIANCE" means the supplier is temporarily not required to comply with an MCL. The Department may grant a variance to a supplier if characteristics of the source(s) that are reasonably available to the system prevent compliance with the MCL, despite implementation of BATs or treatment techniques, and the system meets the requirements specified in 11.43(2).

11.43(2) Variance Qualifications

(a) The Department may grant a variance from an MCL if all of the following criteria are met:

(i) Because of the characteristics of the raw water source(s) which are reasonably available to the system, the supplier cannot meet the requirements respecting the MCLs of such drinking water regulations despite application of the BAT(s) (as described in Regulation 11), treatment techniques, or other means identified by the EPA Administrator.

(ii) Based on a Department-approved evaluation, an alternative source is not reasonably available to the system.

(iii) The variance will not result in an unreasonable risk to public health.

(b) If the supplier can demonstrate to the satisfaction of the Department that a specific treatment technique for a contaminant is not necessary to protect public health because of the nature of the system's source, the supplier may receive one or more variances from any requirement that requires the use of that treatment technique.

(i) If the supplier is granted a variance under 11.43(2)(b), the supplier must comply with any Department-specified monitoring or other requirements.

(c) The Department will not grant a variance from:

(i) The *E. coli* MCLs.

(ii) Any treatment technique requirement of 11.8, 11.9, o11.10, 11.11 or 11.16.

11.43(3) Small System Variance Qualifications

(a) The Department may grant a small system variance from an MCL or treatment technique if all of the following criteria apply:

(i) The system supplies (including the supplier's consecutive system's population served):

(A) Less than or equal to (≤) 3,300 people; or

(B) With EPA Administrator approval, greater than (>) 3,300 people and less than (<) 10,000 people.

(ii) The Department determines that the supplier cannot financially afford to comply with an MCL or treatment technique based on the Department-specified affordability criteria. This includes compliance through one or more of the following:

(A) Treatment.

(B) An alternative source.

(C) Restructuring or consolidation, unless the Department makes a written determination that restructuring or consolidation is not practical.

(iii) The EPA Administrator has identified a small system variance technology that is applicable to the system's size and source water quality.

(A) The supplier must be financially and technically capable of installing, operating, and maintaining the applicable small system variance technology, as specified in guidance or regulations issued by the EPA Administrator.

(iv) The Department determines that the small system variance technology provides adequate protection of public health, considering the system's source water quality and the removal efficiencies and expected useful life of the small system variance technology.

(b) The Department will not grant a small system variance from:

(i) Treatment technique requirements or MCLs for a contaminant which was regulated in the *National Primary Drinking Water Regulations* on or before January 1, 1986.

(ii) A microbial contaminant (e.g., a bacterium, virus or other organism), an indicator for a microbial contaminant, or treatment technique requirement for a microbial contaminant.

(iii) A treatment technique for filtration of surface water sources specified in 11.8, 11.9, 11.10 or a treatment technique requirement in 11.11 or 11.16.

11.43(4) Exemption Qualifications

(a) The Department may grant an exemption from an MCL or treatment technique if all of the following criteria apply:

(i) Due to compelling factors, the supplier is unable to comply with an MCL or treatment technique requirement, or implement measures to develop an alternative source.

(A) Compelling factors may include economic factors (e.g., qualifying as a system that supplies a disadvantaged community).

(ii) The exemption will not result in an unreasonable risk to public health.

(iii) The supplier cannot reasonably make management and/or restructuring changes that result in compliance or, if compliance cannot be achieved, improve the drinking water quality.

(iv) The public water system was in operation on the effective date of the MCL or treatment technique requirement.

(A) The Department may grant an exemption to systems not in operation on the effective date of the MCL or treatment technique requirement if a reasonable alternative source is not available.

(b) If the supplier was granted a variance or small system variance, the supplier will not be granted an exemption.

(c) The supplier will not be granted an exemption from:

(i) The *E. coli* MCLs.

(ii) The entry point residual disinfectant concentration requirement for surface water systems.

(d) To be granted an exemption, the supplier must establish that all practical steps are being taken to meet the MCL or treatment technique requirement and that at least one of the following apply:

(i) The system cannot meet the MCL or treatment technique requirement without capital improvements and the capital improvements cannot be completed before the effective date of the MCL or treatment technique requirement.

(ii) The supplier has entered into an enforceable agreement to become a part of a regional public water system.

(iii) If the supplier needs financial assistance for necessary improvements, either:

(A) The supplier has entered into an agreement to obtain financial assistance; or

(B) Within the period of the exemption, a federal or state program will likely be available.

11.43(5) Applications for Variances and Exemptions

(a) To be granted a variance or exemption, the owner or the owner's authorized representative listed with the Department must submit a completed and signed application.

(b) The application must include all of the following information:

(i) The nature and duration of the variance or exemption requested.

(ii) Relevant water quality sample results, including the results of relevant tests required under the *Colorado Primary Drinking Water Regulations*.

(iii) The interim measures to be continuously implemented during the requested variance or exemption period to adequately protect public health.

(iv) For a variance, an explanation of the compelling factors specified in 11.43(2) or 11.43(3).

(v) For an exemption, an explanation of the compelling factors specified in 11.43(4).

11.43(6) Public Notification and Meeting Requests

(a) The Department shall provide notice and the opportunity for a public hearing on the proposed variance or exemption and its respective schedule as specified in 11.43(9)(d)(iii).

(i) No later than 30 days after the Department has provided notice, any person may file a written request for the Department to hold a public meeting regarding the application for a variance or exemption.

(ii) No later than 30 days after the Department has provided notice, any person may submit written comments on the proposed variance or exemption and its schedule.

(b) For small system variances, the Department shall provide at least one public meeting on the small system variance no later than 15 days after the application is received.

11.43(7) Application Review for Variances and Exemptions

(a) If a submitted application is incomplete, the Department shall notify the supplier in writing no later than 20 days after receiving the application of items needed to complete the application.

(b) No later than 90 days after receiving a complete variance or exemption application, the Department shall make an initial determination to approve or deny the application.

(c) After making the initial determination:

(i) If a written request for a public meeting has not been received, the Department shall issue a final order granting or denying the variance or exemption as specified in 11.43(9).

(ii) If a written request for a public meeting has been received, the Department shall hold a public meeting as specified in 11.43(8).

(iii) If the Department makes an initial determination to deny the application, the Department shall notify the supplier in writing of the initial determination and the grounds on which the application is being denied.

(A) No later than 15 days after receiving the notice of the application's denial, the supplier may submit a response of intent to provide additional argument or information.

(iv) If the Department makes an initial determination to grant a small system variance to a system supplying greater than (>) 3,300 people and less than (<) 10,000 people, any consumer may petition the EPA Administrator to object to the granting of the variance no later than 30 days after the Department makes the initial determination.

(A) No later than 60 days after receiving the petition, the EPA Administrator shall respond to the petition and determine whether to object to the small system variance.

11.43(8) Public Meetings

(a) The Department shall hold a public meeting upon written request or as required by federal law.

(i) The Department may deny frivolous or insubstantial requests for a public meeting.

(b) At least 15 days before the public meeting, the Department shall arrange for publication of the notice of the public meeting.

(i) Notice of the public meeting shall include all of the following:

(A) Name, address, and telephone number of the system for which the variance or exemption is being requested.

(B) The provision of the *Colorado Primary Drinking Water Regulations* from which a variance or exemption is being requested.

(C) The initial determination of the Department regarding the variance or exemption.

(D) The Department's address and telephone number.

(E) A statement that a copy of the application is available for inspection at the Department during regular business hours.

(F) The date, time, and location of the public meeting.

(c) At the public meeting:

(i) Any person is permitted to submit oral or written statements concerning the variance or exemption application.

(ii) A representative of the Department shall preside and:

(A) Maintain a list of the name, address, and telephone number of each person who submits an oral or written statement.

(B) Has the discretion to set reasonable time limits for oral statements.

(iii) The Department shall record the oral statements.

11.43(9) Final Order to Grant or Deny a Variance or Exemption

(a) In determining whether to grant or deny a variance or exemption, the Department shall consider all of the following:

(i) Whether the completed application complies with the criteria for a variance or exemption.

(ii) Any written comments regarding the application received by the Department no later than 30 days after the notice to the public was provided as specified in 11.43(6).

(iii) If the Department has made an initial determination to deny the application, any written response by the supplier as specified in 11.43(7)(c)(iii)(A).

(iv) If a public meeting is held regarding the application, any written or oral statements submitted at the public meeting.

(b) For systems supplying greater than (>) 3,300 people and less than (<) 10,000 people if the supplier has requested a small system variance, the EPA Administrator must approve the small system variance request before the Department may issue a final order to grant the small system variance.

(i) The EPA Administrator shall grant or deny the small system variance no later than 90 days after the Department submits the request for approval.

(c) If there is no compelling evidence to change the Department's initial determination, the Department shall issue a final order to either grant or deny the variance or exemption according to the initial determination.

(d) If the variance or exemption is granted, the final order will include all of the following:

(i) The provision of the *Colorado Primary Drinking Water Regulations* from which the exemption or variance is granted.

(ii) The duration of the variance or exemption.

(iii) A schedule for all of the following:

(A) Achieving compliance with the MCL or treatment technique from which the variance or exemption was granted, including increments of progress.

(B) The date by which compliance with the MCL or treatment technique is required. For variances and exemptions, compliance must be achieved as soon as the Department determines possible.

(I) For exemptions, this must be no later than three years after the otherwise applicable compliance date for the MCL or treatment technique requirement for which the exemption was granted.

(II) For small system variances, this must be no later than three years after the small system variance is granted. If the Department determines that additional time is necessary for capital improvements, or to allow for financial assistance from a federal or state program, the Department may allow up to two additional years to comply with a variance technology, secure an alternative source, restructure or consolidate.

(C) Implementation of any Department-required control measures, including any Department-required control measures ending on the date when compliance with the MCL or treatment technique is required.

(e) A copy of the Department's final order will be mailed to all of the following people:

(i) The applicant.

(ii) All of those who submitted written comments that were received by the Department no later than 30 days after the notice to the public as specified in 11.43(6).

(iii) If a public meeting was held, all of those who submitted statements at the public meeting regarding the variance or exemption.

(f) If granted, the variance or exemption will become effective 90 days after the Department issues the final order.

(g) Any person adversely affected or aggrieved by the Department's final order may request an adjudicatory hearing on the final order.

(i) The hearing request must be filed in writing no later than 60 days after the effective date of the Department's final order granting the variance or exemption, or no later than 60 days after service of the order denying the variance or exemption.

(A) If granted, the variance or exemption will remain in effect until a determination is made at the hearing.

(ii) The hearing shall be conducted as specified in section 24-4-105, Colorado Revised Statutes.

11.43(10) Operation with a Variance or Exemption

(a) To maintain the variance or exemption, the supplier must comply with the Department-issued final order including the schedule specified in 11.43(9)(d)(iii).

(b) For small system variances, the supplier must install, operate, and maintain the small system variance technology in accordance with guidance or regulations issued by the EPA Administrator.

(c) The Department may enforce any requirement of the schedule, variance, or exemption as if it were a requirement of the *Colorado Primary Drinking Water Regulations*.

(d) If the supplier fails to comply with the final order granting the variance or exemption, the Department may revoke the variance or exemption pursuant to section 24-4-104, Colorado Revised Statutes, and will conduct hearings regarding such revocations as specified in section 24-4-105, Colorado Revised Statues.

(e) The supplier must distribute Tier 3 public notice as specified in 11.33.

(f) The supplier must distribute consumer notice as specified in 11.34.

(g) To determine whether the supplier remains eligible for a small system variance, the Department shall review each small system variance at least every five years after the compliance date established in the small system variance.

(h) For systems that have been granted an exemption and supply less than or equal to (≤) 3,300 people, and need financial assistance for necessary improvements, the Department may renew an exemption granted under 11.43(4)(d)(i) or 11.43(4)(d)(iii) for no more than three additional two-year periods if the supplier establishes that all practical steps are taken to meet the MCL or treatment technique requirement.

11.44 POINT-OF-ENTRY DEVICES AND BOTTLED WATER RULE

11.44(1) Use of Point-of-Entry Devices

(a) The supplier may only use point-of-entry devices to comply with MCLs if all the requirements specified in this section, 11.44(1), are met.

(b) The supplier must use and properly apply point-of-entry devices that are an effective technology for complying with the MCL(s).

(c) The supplier must develop a Department-approved point-of-entry device plan that shows that the point-of-entry devices are an effective technology for complying with the MCL(s) and will maintain the microbiological safety of the water.

(i) The plan must demonstrate that the point-of-entry devices will provide public health protection equivalent to central water treatment.

(A) "EQUIVALENT" means that the water will meet all *Colorado Primary Drinking Water Regulations* and will be of acceptable quality, similar to water distributed by a well-operated central treatment plant.

(d) The design and application of the point-of-entry devices must:

(i) Include an adequate process for certification of performance, field testing, and, if not included in the certification process, a rigorous engineering design review of the point-of-entry devices.

(ii) Consider the tendency for an increase in heterotrophic bacteria concentrations in water treated with activated carbon.

(e) The supplier must develop a monitoring plan for the point-of-entry devices and obtain Department approval for the monitoring plan before installing any point-of-entry devices.

(i) The monitoring must include physical measurements and observations such as total flow treated and mechanical condition of the treatment equipment.

(f) The supplier must have a point-of-entry device installed, maintained, and adequately monitored at every building connected to the distribution system and ensure that the rights and responsibilities of the customer are conveyed with the title upon sale of property.

(i) The supplier must demonstrate to the Department that these requirements have been met.

(g) The supplier is responsible for the maintenance and operation of each point-of-entry device.

11.44(2) Use of Bottled Water

(a) The supplier cannot use bottled water to achieve compliance with an MCL.

(b) The supplier may use bottled water on a temporary basis to avoid unreasonable risk to public health.

11.45 MCLs, MCLGs, SMCLs, MRDLs, MRDLGs, AND ACTION LEVELS

11.45(1) MCLs and MCLGs for Microbiological Contaminants

The following MCLs and MCLGs apply to all public water systems regardless of size or type.

TABLE 11.45-I MCLs AND MCLGs FOR MICROBIOLOGICAL CONTAMINANTS				
Contaminant	Number of samples	MCL	MCLG	MCL Violation Citation
Cryptosporidium		N/A	Zero	N/A
Giardia lamblia		N/A	Zero	N/A
Viruses		N/A	Zero	N/A
Legionella		N/A	Zero	N/A
Fecal coliform or *E. coli* repeat sample (following routine total coliform-positive sample) or any total coliform-positive repeat sample following a fecal coliform-positive or *E. coli*-positive routine sample.		Absent	Zero	11.11 for the Ground Water Rule) and 11.16 for the Revised Total Coliform Rule
Escherichia coli		1. *E. coli*-positive repeat sample following a total coliform-positive routine sample, 2. total coliform-positive repeat sample following an *E. coli*-positive routine sample, 3. failure to collect all required repeat samples following an *E. coli*-positive routine sample, or 4. failure to analyze a total-coliform positive repeat sample for *E. coli*.	Zero	11.11 for the Ground Water Rule and 11.16 for the Revised Total Coliform Rule

11.45(2) MCLs and MCLGs for Inorganic Chemicals

The following MCLs and MCLGs for inorganic chemicals apply to all community and non-transient, non-community water systems, except:

(a) The MCLs and MCLGs for nitrate, nitrite, and total nitrate and nitrite apply to all public water systems.

(b) The MCL and MCLG for fluoride apply only to community water systems and may be applied to non-community water systems when found by the Department to be necessary to protect public health.

TABLE 11.45-II MCLs AND MCLGs FOR INORGANIC CHEMICALS

Contaminant	MCL (mg/L)	MCLG (mg/L)
Antimony	0.006	0.006
Arsenic	0.010	Zero
Asbestos	7 Million Fibers/liter (Longer than 10 µm)	7 Million Fibers/liter (Longer than 10 µm)
Barium	2	2
Beryllium	0.004	0.004
Cadmium	0.005	0.005
Chromium	0.1	0.1
Cyanide (as free Cyanide)	0.2	0.2
Fluoride	4.0	4.0
Mercury	0.002	0.002
Nitrate	10 (as Nitrogen)	10 (as Nitrogen)
Nitrite	1 (as Nitrogen)	1 (as Nitrogen)
Total Nitrate and Nitrite	10 (as Nitrogen)	10 (as Nitrogen)
Selenium	0.05	0.05
Thallium	0.002	0.0005

11.45(3) MCLs and MCLGs for Organic Chemicals

(a) The following MCLs and MCLGs for volatile organic chemicals (VOCs) apply to all community and non-transient, non-community water systems.

TABLE 11.45-III MCLs AND MCLGs FOR VOCs

Contaminant	MCL (mg/L)	MCLG (mg/L)
Vinyl chloride	0.002	Zero
Benzene	0.005	Zero
Carbon tetrachloride	0.005	Zero
1,2-Dichloroethane	0.005	Zero
Trichloroethylene	0.005	Zero
Para-Dichlorobenzene	0.075	0.075
1,1-Dichloroethylene	0.007	0.007
1,1,1-Trichloroethane	0.2	0.20
cis-1,2 Dichloroethylene	0.07	0.07
1,2-Dichloropropane	0.005	Zero
Ethylbenzene	0.7	0.7
Monochlorobenzene	0.1	0.1
o-Dichlorobenzene	0.6	0.6
Styrene	0.1	0.1
Tetrachloroethylene	0.005	Zero
Toluene	1	1
Trans-1,2 Dichloroethylene	0.1	0.1
Xylenes (total)	10	10
Dichloromethane (methylene chloride)	0.005	Zero
1,2,4-Trichlorobenzene	0.07	0.07
1,1,2-Trichloroethane	0.005	0.003

(b) The following MCLs and MCLGs for synthetic organic chemicals (SOCs) apply to all community and non-transient, non-community water systems:

TABLE 11.45-IV MCLs AND MCLGs FOR SOCs

Contaminant	MCL (mg/L)	MCLG (mg/L)
Alachlor	0.002	Zero
Aldicarb[1]	0.003	0.001
Aldicarb sulfoxide	0.004	0.001
Aldicarb sulfone	0.002	0.001
Atrazine	0.003	0.003
Carbofuran	0.04	0.04
Chlordane	0.002	Zero
Dibromochloropropane	0.0002	Zero
2,4-D	0.07	0.07
Ethylene dibromide	0.00005	Zero
Heptachlor	0.0004	Zero
Heptachlor epoxide	0.0002	Zero
Lindane	0.0002	0.0002
Methoxychlor	0.04	0.04
Polychlorinated biphenyls	0.0005	Zero

Contaminant	MCL (mg/L)	MCLG (mg/L)
Pentachlorophenol	0.001	Zero
Toxaphene	0.003	Zero
2,4,5-TP (Silvex)	0.05	0.05
Benzopyrene	0.0002	Zero
Dalapon	0.2	0.2
Di(2-ethylhexyl)adipate	0.4	0.4
Di(2-ethylhexyl)phthalate	0.006	Zero
Dinoseb	0.007	0.007
Diquat	0.02	0.02
Endothall	0.1	0.1
Endrin	0.002	0.002
Glyphosate	0.7	0.7
Hexachlorobenzene	0.001	Zero
Hexachlorocyclopentadiene	0.05	0.05
Oxamyl (Vydate)	0.2	0.2
Picloram	0.5	0.5
Simazine	0.004	0.004
2,3,7,8-TCDD (Dioxin)	3 x 10- [8]	Zero

1 The aldicarbs are currently under "administrative stay" as a result of litigation. They are therefore treated as unregulated contaminants until further notice.

11.45(4) MCLs and MCLGs for Radionuclides

The following MCLs and MCLGs for radionuclides apply to all community water systems.

TABLE 11.45-V MCLs AND MCLGs FOR RADIONUCLIDES

Contaminant	MCL	MCLG
Combined radium-226 and radium-228[1]	5 pCi/L	Zero
Gross alpha particle activity (including radium-226 but, excluding radon and uranium)	15 pCi/L	Zero
Beta particle and photon radioactivity[2]	4 mrem/yr[3]	Zero
Uranium	30 µg/L	Zero

1 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.

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

3 Except for the radionuclides listed in Table 11.22-II of section 11.22(4)(b), the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents must be calculated on the basis of 2 liter per day drinking water intake using the 168 hour data list in "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," NBS (National Bureau of Standards) Handbook 69 as amended August 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem/year.

11.45(5) MRDLs and MRDLGs for Disinfectants

The following MRDLs and MRDLGs for disinfectant residuals apply to all community and non-transient, non-community water systems, except:

(a) The MRDL and MRDLG for chlorine dioxide apply to all public water systems.

TABLE 11.45-VI MRDLs AND MRDLGS FOR DISINFECTANTS

Disinfectant residual	MRDL (mg/L)	MRDLG (mg/L)
Chlorine	4.0 (as Cl_2)	4.0 (as Cl_2)
Chloramines	4.0 (as Cl_2)	4.0 (as Cl_2)
Chlorine dioxide[1]	0.8 (as ClO_2)	0.8 (as ClO_2)

1 The MRDL and MRDLG for chlorine dioxide only apply to those systems that use chlorine dioxide as a disinfectant or oxidant somewhere in the treatment process.

11.45(6) MCLs and MCLGs for Disinfection Byproducts

The following MCLs and MCLGs for disinfection byproducts apply to all community and non-transient, non-community water systems.

TABLE 11.45-VII MCLs AND MCLGs FOR DISINFECTION BYPRODUCTS

Disinfection byproduct	MCL (mg/L)	MCLG (mg/L)
Total trihalomethanes (TTHM)	0.0801	
Bromodichloromethane		Zero
Bromoform		Zero
Chloroform		0.07
Dibromochloromethane		0.06
Haloacetic acids (five) (HAA5)	0.0601	
Bromoacetic acid		N/A
Dibromoacetic acid		N/A
Dichloroacetic acid		Zero
Monochloroacetic acid		0.07
Trichloroacetic acid		0.02
Bromate[2]	0.010	Zero
Chlorite[3]	1.0	0.8

1 All systems must comply with these MCLs as an LRRA.

2 The MCL and MCLG for bromate only apply to those systems that use ozone as a disinfectant or oxidant somewhere in their treatment process.

3 The MCL and MCLG for chlorite only apply to those systems that use chlorine dioxide as a disinfectant or oxidant somewhere in the treatment process.

11.45(7) Action Levels and MCLGs for Lead and Copper

The following action levels for lead and copper apply to all community and non-transient, non-community water systems.

TABLE 11.45-VIII ACTION LEVELS AND MCLGs FOR LEAD AND COPPER

Contaminant	Action level (mg/L)	MCLG (mg/L)
Copper	1.3	1.3
Lead	0.015	Zero

11.45(8) Secondary Maximum Contaminant Levels

(a) These contaminants in drinking water primarily affect the aesthetic qualities relating to the public acceptance of drinking water. At considerably higher concentrations of these contaminants, health implications may also exist as well as aesthetic degradation. The secondary maximum contaminant levels are not enforceable, but are intended as guidelines that represent reasonable goals for drinking water quality.

TABLE 11.45-IX SECONDARY MAXIMUM CONTAMINANT LEVELS

Contaminant	Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 color units
Copper	1.0 mg/L
Corrosivity	Non-corrosive
Fluoride	2.0 mg/L[1]
Foaming agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.1 mg/L
Sulfate	250 mg/L
Total dissolved solids (TDS)	500 mg/L
Zinc	5 mg/L

1 When the fluoride level exceeds the SMCL of 2.0 mg/L public notification in accordance with 11.19 is required.

(b) It is recommended that the contaminants specified in Table 11.45-IX be monitored at intervals no less frequently than the sampling performed for inorganic chemicals as applicable to community water systems. More frequent monitoring would be appropriate for specific parameters such as pH, color, odor, or others under certain circumstances.

11.46 ANALYTICAL REQUIREMENTS AND LABORATORY CERTIFICATION RULE

11.46(1) Applicability

For all public water systems, the supplier must ensure that all samples meet the testing requirements and analytical methods of this rule.

11.46(2) Bacteriological Analytical Requirements

(a) Total Coliform Analytical Requirements

The testing requirements and analytical methods for total coliform analysis are specified in 40 CFR 141.852(a-c).

(b) Fecal Coliform Analytical Requirements

The testing requirements and analytical methods for fecal coliform analysis are specified in 40 CFR 141.21(f)(5).

(c) *Escherichia coli* Analytical Requirements

The testing requirements and analytical methods for Escherichia coli analysis are specified in 40 CFR 141.25(f)(6-7), 40 CFR 141.704(b) and 40 CFR 141.852(a-c).

(d) *Cryptosporidium* Analytical Requirements

The testing requirements and analytical methods for Cryptosporidium analysis are specified in 40 CFR 141.704(a) and 40 CFR 141.707(c)(2).

(e) Groundwater Source Analytical Requirements

The testing requirements and analytical methods for groundwater source water sample analysis are specified in 40 CFR 141.402(c).

(f) Heterotrophic Bacteria Analytical Requirements

The testing requirements and analytical methods for heterotrophic bacteria are specified in 40 CFR 141.74(a).

11.46(3) Inorganic Chemical Analytical Requirements

The testing requirements and analytical methods for inorganic chemical analysis are specified in 40 CFR 141.23(a)(4)(i) and 40 CFR 141.23(k)(1-2).

11.46(4) SOC and VOC Analytical Requirements

The testing requirements and analytical methods for SOCs and VOCs are specified in 40 CFR 141.24(e).

11.46(5) PCB Analytical Requirements

The testing requirements and analytical methods for PCBs are specified in 40 CFR 141.24(h)(13).

11.46(6) Radionuclide Analytical Requirements

The testing requirements and analytical methods for radionuclides are specified in 40 CFR 141.25(a-c).

11.46(7) Turbidity Analytical Requirements

The testing requirements and analytical methods for turbidity are specified in 40 CFR 141.74(a).

11.46(8) Disinfection, Disinfection Byproducts, and Disinfection Byproduct Precursors Analytical Requirements

(a) Disinfection Byproduct Precursors Rule Analytical Requirements

The testing requirements and analytical methods for the disinfection byproduct precursor rule are specified in 40 CFR 141.131(a)(1-2) and 40 CFR 141.131(d)(1-6).

(b) Disinfection Residual Analytical Requirements

The testing requirements and analytical methods for free chlorine, chloramines, chlorine dioxide, and ozone are specified in 40 CFR 141.74(a), 40 CFR 141.131(a), and 40 CFR 141.131(c).

(c) Disinfection Byproducts Rule Analytical Requirements

The testing requirements and analytical methods for disinfection byproducts rule are specified in 40 CFR 141.131(a) and 40 CFR 141.131(b).

11.46(9) Lead and Copper Rule Analytical Requirements

The testing requirements and analytical methods for lead, copper, pH, conductivity, calcium, alkalinity, orthophosphate, silica, and temperature are specified in 40 CFR 141.89(a)(1-4).

11.46(10) Secondary Contaminants Analytical Requirements

The testing requirements and analytical methods for secondary contaminants are specified in 40 CFR 143.4(b).

11.46(11) Alternative Analytical Techniques

The use of alternative testing requirements and analytical methods are specified in 40 CFR 141.27(a) and Appendix A to Subpart C of 40 CFR 141.

11.46(12) Certified Laboratories and Laboratory Certification

(a) Certified Laboratories

The requirements for a certified laboratory are specified in 40 CFR 141.28(a).

(b) Laboratory Certification for Inorganic Chemicals

The laboratory certification requirements for inorganic chemicals are specified in 40 CFR 141.23(k)(3).

(c) Laboratory Certification for VOCs

The laboratory certification requirements for VOCs are specified in 40 CFR 141.24(f)(17) and 40 CFR 141.24(f)(20).

(d) Laboratory Certification for SOCs

The laboratory certification requirements for SOCs are specified in 40 CFR 141.24(h)(19).

(e) Laboratory Certification for *Cryptosporidium*, *E. coli*, and Turbidity

The laboratory certification requirements for *Cryptosporidium*, *E. coli*, and turbidity are specified in 40 CFR 141.705(a-c).

11.46(13) Laboratory Compositing

The requirements for compositing of samples by a laboratory are specified in 40 CFR 141.24(f)(14).

11.46(14) Calculating Contact Time Values

(a) The requirements for calculating contact time values are specified in 40 CFR 141.74(b)(3-4).

(b) Disinfectant contact time in pipelines must be calculated based on the consideration of the liquid level in the pipeline and dividing that volume by the maximum hourly flow rate through that pipe. Disinfectant contact time within mixing basins and storage reservoirs must be determined by tracer studies, or an equivalent demonstration, or by baffling factor estimates considering the minimum operating level.

11.47 UNREGULATED CONTAMINANT MONITORING RULE

11.47(1) Applicability and Requirements for Unregulated Contaminant Monitoring

All public water systems must monitor for unregulated contaminants as specified in 40 CFR 141.40 and comply with the requirements specified in this rule.

11.47(2) Public Notice for Unregulated Contaminant Monitoring

No later than 12 months after receiving the unregulated contaminant monitoring results, the supplier must distribute Tier 3 public notice to consumers notifying them of the availability of the monitoring results as specified in rule 11.33.

11.48 RESERVED

11.49 RESERVED

11.50 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: July 9, 2007 Rulemaking, Effective September 30, 2007

Adoption of Section 7.4 – Enhanced Treatment for Cryptosporidium, Section 7.7 – Initial Distribution System Evaluations (IDSE) and Section 7.8 – Additional Requirements for Disinfection Byproducts Compliance with Amendments to Articles 1, 2, 7, 9, 10 and 12(c) of the *Colorado Primary Drinking Water Regulations*.

The provisions of the Colorado Revised Statutes (CRS), §25-1.5-202, provides specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as by the *Colorado Primary Drinking Water Regulations* under the direction of the Water Quality Control Division (Division). Colorado has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act; however, in order to maintain primacy, states must promulgate regulations that are no less stringent than those adopted by the federal government. By retaining primacy, the Division is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors and remains eligible both for program grants of $1.3 million and for federal revolving funds to assist water systems construct facility improvements of $13 million per year.

The Commission amends Articles 1, 2, 7, 9, 10, and 12(c) of the *Colorado Primary Drinking Water Regulations* to include:

- The provisions of the federal regulations as published in the Federal Register, Volume 71, Number 2, January 4, 2006, pages 388 through 493, National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule incorporated as sections 7.7 and 7.8.

- The provisions of the federal regulations as published in the Federal Register, Volume 71, Number 3, January 5, 2006, pages 654 through 786, National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Rule incorporated as section 7.4.

- Changes referencing the Commission throughout the regulation instead of the Board of Health in accordance with §25-8-202(1)(n), C.R.S.

- Numerous minor changes removing obsolete references and definitions that are not used within the regulation, and correction of spelling and typographical errors, including a number of non-substantive amendments to Article 10 in an effort to provide clarity (such as spelling out abbreviations), and to provide consistency in the citing of materials incorporated by reference (i.e. EPA and other nationally-recognized test methods). Many of the references to these test methods contained unnecessary information about the places where copies could be obtained.

The Commission also updated the numbering of footnotes throughout the regulation for consistency.

Sections 7.7 and 7.8 amend the existing regulatory requirements for disinfection byproducts for all public water systems in Colorado that add a disinfectant to the water in any part of the drinking water treatment process. Section 7.4 amends existing treatment requirements for all public water systems in Colorado that use surface water or groundwater under the direct influence of surface water as drinking water sources.

These amendments and additions provide for increased public health protection against the potential risks for cancer and adverse reproductive and developmental health effects associated with disinfection byproducts and they provide further public health protection against *Cryptosporidium* and other microbial pathogens in drinking water.

The provisions of sections 7.7 and 7.8, Stage 2 Disinfectants and Disinfection Byproducts Rule, are summarized as follows:

- Adds recordkeeping requirements for turbidity and monitoring plans.

- Establishes maximum contaminant level goals for chloroform, monochloroacetic acid and trichloroacetic acid.

- Finalizes maximum contaminant levels for disinfection byproducts.

- Changes compliance from system-wide running annual average to locational running annual average at each monitoring location.

- Revises the requirements for reduced monitoring for bromate.

- Specifies the best available technologies for control of disinfection byproducts in drinking water.

- Revises the public notification requirements for total trihalomethanes and haloacetic acids.

- Approves additional analytical methods for the determination of disinfectants and disinfection byproducts in drinking water.

The Stage 2 Disinfectants and Disinfection Byproducts Rule is designed to further minimize the formation of disinfection byproducts in the finished water in an effort to reduce the associated long-term cancer risks and reproductive and developmental health effects associated with disinfection byproducts while ensuring continued protection from microbiological contaminants that may pose an acute health threat.

The Commission is simultaneously amending the *Colorado Primary Drinking Water Regulations* to include the provisions of the National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule to ensure that drinking water is microbiologically safe while considering the limits set for disinfection byproducts.

The provisions of section 7.4, Long Term 2 Enhanced Surface Water Rule, are summarized as follows:

- Requires public water systems using surface water or groundwater under the direct influence of surface water to monitor their source water to determine an average *Cryptosporidium* level.

    - Specifies criteria for sampling frequency and schedule, sampling location, use of previously collected data, providing treatment instead of monitoring, sampling by systems that use surface water for only part of the year, and monitoring of new plants and sources.

    - Establishes requirements for reporting monitoring results, using approved analytical methods, and using certified laboratories for all analysis.

- Supplements current regulations by establishing risk-targeted treatment technique requirements to control *Cryptosporidium* in public water systems using surface water or groundwater under the direct influence of surface water. (Existing regulations remain in effect.)

- Based on the results of the source water *Cryptosporidium* monitoring, systems will be classified in one of four (4) treatment categories or "bins." The bin classification determines the degree of additional *Cryptosporidium* treatment, if any, the system must provide.

- Adds the Microbial Toolbox options that systems must use if required to meet the additional *Cryptosporidium* treatment required based on bin classification.

- Adds recordkeeping requirements specific to the changes.

- Adds requirements for a "Special notice for repeated failure to conduct monitoring of the source water for *Cryptosporidium* and for failure to determine bin classification or mean *Cryptosporidium* level" to the Public Notification requirements.

- Specifies the Public Notification tier level of notice for violations related to these amendments.

Implementing the Long Term 2 Enhanced Surface Water Rule will substantially lower rates of endemic cryptosporidiosis, the illness caused by *Cryptosporidium*, which can be severe and sometimes fatal in sensitive subpopulations (e.g., infants, people with weakened immune systems). In addition, the treatment technique requirements will increase protection against other microbial pathogens like *Giardia lamblia*.

In addition to the inclusion of sections 7.4, 7.7 and 7.8, the *Colorado Primary Drinking Water Regulations* are amended as follows:

Article 1

1. Sections 1.1, 1.3, and 1.4 are amended to replace references to the State Board of Health with the Water Quality Control Commission.

2. Section 1.3 is amended to remove references to Colorado State Board of Health regulations from 1950 and 1954. These references are obsolete and no longer applicable.

3. Section 1.5.2 is amended to correct the definition of initial compliance period, to change the definition of consecutive systems, integrated systems, deletes the definition of supply systems, and adds the definitions of dual sample set, emergency source/connection, GAC 20, Initial Distribution System Evaluation (IDSE), finished water, locational running annual average (LRAA), Water Quality Control Commission, and wholesale systems. The definitions for consecutive systems, integrated systems and supply systems were Colorado specific and conflicted with or were redundant to the EPA definitions of consecutive systems and wholesale systems added as part of the Stage 2 Disinfection Byproducts Rule.

4. Section 1.5.2 is amended to include definitions for Bag filters, Bank filtration, Cartridge filters, Flowing stream, Lake/reservoir, Membrane filtration, Membrane module, Plant intake, Presedimentation, Recycle, Two-stage lime softening, and Uncovered finished water storage facility added by the Long Term 2 Enhanced Surface Water Rule.

5. Section 1.5.2 is amended to adjust numbering of definitions because of additions and removal of definitions that are no longer used in the regulation.

6. Section 1.6.3 is amended to add the record keeping requirements specified by the Stage 2 Disinfection Byproducts Rule and the Long Term 2 Enhanced Surface Water Rule.

7. Sections 1.8, 1.9 and 1.10 are amended to reflect the changes in definition for consecutive systems and wholesale systems.

8. Section 1.14 is amended to include the Laboratory Services Division as a place where materials incorporated by reference could be examined.

Article 2

Section 2.4 is amended to include the new maximum contaminant level goals (MCLG) for chloroform, monochloroacetic acid and trichloroacetic acid.

Article 7

1. Section 7.3.7 was moved to section 1.6.3 for consistency.

2. Section 7.4 and 7.5 are renumbered to 7.5 and 7.6 respectively because of the addition of the requirements for Long Term 2 Enhanced Surface Water Rule as section 7.4.

3. Section 7.6.3(b)(1)(iv) has been amended to add the following language:

   "Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively."

   This language was inadvertently omitted in the Federal Register when Stage 1 Disinfectants, Disinfection Byproducts Rule was printed. The Stage 2 Disinfection Byproducts Rule includes the reinstatement of this language to the Stage 1 DDBP Rule.

4. Section 7.6.3(b)(3)(ii) has been amended to change the requirements for reduced monitoring for bromate.

Article 9

1. Section 9.1.3(d)(iv) is amended to clarify reporting of results for the Stage 2 Disinfection Byproducts Rule in the community water system's annual Consumer Confidence Report.

2. Tables 9-7 and 9-8 with endnotes are amended to update the health effects language for public notifications and tier requirements for violations of the Stage 2 Disinfection Byproducts Rule.

3. Section 9.2.11 is amended to add the special notice requirements for repeated failure to conduct monitoring of the source water for *Cryptosporidium* and for failure to determine bin classification or mean *Cryptosporidium* level and to identify the public notification tier levels for violations of the Long Term 2 Enhanced Surface Water Rule.

Article 10

Article 10 is amended to include additional approved analytical methods for drinking water analyses for disinfection byproducts and disinfection byproduct precursors.

Article 12

Section 12.2(c) is amended to replace references to the State Board of Health with the Water Quality Control Commission.

Aspects of the Long Term 2 Enhanced Surface Water Rule that were not included in the *Colorado Primary Drinking Water Regulations*:

1. Long Term 2 Enhanced Surface Water Rule, Section 40 CFR 141.712, and other CFR sections which allow systems to use unfiltered surface water were not incorporated in the regulation. Historically, the regulations promulgated by the Colorado State Board of Health have required all public water systems that use surface water or groundwater under the direct influence of surface water to provide filtration.

2. Language from the Long Term 2 Enhanced Surface Water Rule, Section 40 CFR 141.714 that allows for the use of uncovered finished water storage facilities was not incorporated in the regulation. Historically, the regulations promulgated by the Colorado State Board of Health have required all public water systems to use only covered finished water storage facilities. There are currently no known uncovered finished water storage facilities in use and existing regulatory language prohibits the new construction of such a facility.

3. The federal rule includes requirements for systems to respond to significant deficiencies identified in sanitary surveys performed by EPA. Sanitary surveys of public water systems in Colorado are conducted by the Department and requirements for the system to respond in writing to significant deficiencies are already included in Article 11 of the *Colorado Primary Drinking Water Regulations*. Language from the federal rule that makes reference to sanitary surveys performed by EPA was not incorporated in the regulation.

Parties to Rulemaking Hearing

1. City of Boulder

11.51 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: July 14, 2008 Rulemaking Hearing; Effective Date September 30, 2008

Adoption of Article 13 – Groundwater Rule, with Amendments to Articles 1, 5, 7, 9, 10 and 11 of the *Colorado Primary Drinking Water Regulations*.

The Colorado Revised Statutes (CRS), §25-1.5-202, provide specific authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as by the *Colorado Primary Drinking Water Regulations* under the direction of the Water Quality Control Division (Division). Colorado has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. However, in order to maintain primacy, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. By retaining primacy, the Division is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors and remains eligible for program grants of $1.3 million and for federal revolving funds to assist public water systems construct facility improvements of $13 million per year.

The Commission adds Article 13, and amends Articles 1, 5, 7, 9, 10 and 11 of the *Colorado Primary Drinking Water Regulations* to include:

- The provisions of the federal regulations as published in the Federal Register, Volume 71, Number 216, November 8, 2006, pages 65574 through 65660, National Primary Drinking Water Regulations: Groundwater Rule incorporated as Article 13.

- Additional definitions and record keeping and reporting requirements.

- Moving Article 7 concerning Disinfection for Groundwater to Article 13.

- Additions to Consumer Notification requirements.

- Additions to Analytical Requirements and Laboratory Certification.

- Changes to Article 11 concerning requirements to correct significant deficiencies and violations detected during sanitary surveys to better align with new requirements in the Groundwater Rule. The changes in this section that will become effective after December 1, 2009 will ensure uniformity of requirements regardless of water system type or source.

- Numerous minor changes removing obsolete references and definitions that are not used within the regulation, and correction of spelling and typographical errors.

Article 13 amends and adds regulatory requirements for all public water systems in Colorado that use groundwater sources.

These amendments and additions provide for increased public health protection against microbial pathogens in public water systems that use groundwater sources.

The provisions of Articles 11 and 13 are summarized as follows:

- Increased frequency of sanitary surveys at groundwater systems to check for significant deficiencies in eight key operational areas.

- Specific requirements for public water systems to correct significant deficiencies in a timely fashion.

- A flexible program for identifying higher risk systems through existing Total Coliform Rule monitoring and State determinations.

- Groundwater source monitoring to detect fecal contamination at targeted groundwater systems that do not provide 4-log treatment of viruses.

- Treatment technique requirements to address fecal contamination in groundwater.

- Compliance monitoring to ensure that 4-log treatment (99.99 percent removal/inactivation) of viruses is maintained where it is used to comply with this rule.

The Groundwater Rule establishes a risk-targeted approach to identify groundwater systems that are susceptible to fecal contamination. The occurrence of fecal indicators in a drinking water supply is an indication of the potential presence of microbial pathogens that may pose a threat to public health. This rule requires groundwater systems with sources that are confirmed to contain indicators of fecal contamination to take corrective action to reduce potential cases of illnesses and deaths due to exposure to microbial pathogens.

In addition to the inclusion of Article 13, the *Colorado Primary Drinking Water Regulations* are amended as follows:

Article 1

1. Section 1.5.2 is amended to include definitions for 4-Log Treatment of Viruses, Assessment Source Water Monitoring, Compliance Monitoring, Groundwater System (GWS), Hydrogeologic Sensitivity Assessment (HAS), Inactivation, Triggered Source Water Monitoring, and Triggered Source Water Monitoring Plan added by the Groundwater Rule.

2. Section 1.5.2(119) is amended to include additional language for clarification.

3. Section 1.5.2 is amended to adjust numbering of definitions because of the added definitions.

4. Section 1.6.3 is amended to add the record keeping requirements specified by the Groundwater Rule.

5. Section 1.6.4 is amended to add the reporting requirements specified by the Groundwater Rule.

Article 5

1. Section 5.1.2 (e) and (h) were amended to remove language that was not consistent with federal drinking water requirements.

Article 7

1. Section 7.9 Disinfection for Groundwater was moved to section 13.2 for consistency.

Article 9

1. Section 9.1.3(h) is amended to include reporting requirements for the Groundwater Rule in the community water system's annual Consumer Confidence Report.

2. Section 9.1.3 is amended to adjust numbering because of additions.

3. Table 9-1 Table of Regulated Contaminants is amended to add Fecal Indicators.

4. Table 9-4 Violation Categories and Other Situations Requiring a Tier 1 Public Notice is amended to include requirements of the Groundwater Rule.

5. Table 9-5 Violation Categories and Other Situations Requiring a Tier 2 Public Notice is amended to include requirements of the Groundwater Rule.

6. Table 9-6 Violation Categories and Other Situations Requiring a Tier 3 Public Notice is amended to include requirements of the Groundwater Rule.

7. Table 9-7 is amended to update language for public notification concerning waiver of disinfection.

8. Tables 9-7 and 9-8 with endnotes are amended to update the health effects language for public notifications and tier requirements for violations of the Groundwater Rule.

9. Special notice requirements for groundwater systems with a waiver of disinfection are added as section 9.2.12.

10. Section 9.2.12 List of Acronyms Used in Public Notification Regulation, is renumbered as Section 9.2.13 to adjust numbering because of previous addition and is amended to add the acronym GWR for the Groundwater Rule.

Article 10

1. Section 10.1.5 is added to include additional approved analytical methods for fecal indicators analyses in drinking water sources.

2. Article 10 is amended to adjust numbering because of additions.

Article 11

1. Section 11.2 is amended to increase the frequency of sanitary surveys at groundwater systems in accordance with the Groundwater Rule.

2. Section 11.3 is amended to adjust numbering.

3. Section 11.4 is amended to align with requirements concerning significant deficiencies in 13.4 of the Groundwater Rule.

11.52 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: October 14, 2008 Written Comment Only Rulemaking Hearing; Effective Date November 30, 2008

Adoption of amendments to Articles 1, 7, 9, 10, 11 and 13 of the *Colorado Primary Drinking Water Regulations*.

The Colorado Revised Statutes (CRS), §25-1.5-202, provide specific authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as by the *Colorado Primary Drinking Water Regulations* under the direction of the Water Quality Control Division (Division). Colorado has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. However, in order to maintain primacy, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. As required by 40 CFR 142.12, the Division submitted a drinking water program primacy revision application for the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) and the Stage 2 Disinfectant and Disinfection Byproducts Rule (Stage 2). This application included the *Colorado Primary Drinking Water Regulations* effective 09/30/2007. EPA reviewed the Division's application and found instances where the *Colorado Primary Drinking Water Regulations* are less stringent than the federal language.

Additionally, Section 1.6.4(e) is a Colorado-specific requirement, not a provision of the federal regulation, nor is it a primacy requirement. 1.6.4(e) requires an original signature on all documents submitted to the Division and applies to paper documents as well as to information received electronically over the Internet. Eliminating this Colorado-specific provision will facilitate Colorado's implementation of Electronic Data Interchange (EDI) - the submission of laboratory results, required reports and other data from private laboratories and public water systems via the Internet. Among other benefits, the implementation of EDI will improve the accuracy of compliance data entered into the Division's compliance database, offer regulated entities a streamlined reporting tool, and reduce the management of paper-based reports for the Division, laboratories and public water systems.

The Commission amends Articles 1, 7, 9, 10, 11 and 13 of the *Colorado Primary Drinking Water Regulations* to include:

- Items identified by EPA during review of the Division's primacy application for LT2 and Stage 2.

- Removal of 1.6.4(e).

- Numerous minor changes to correct spelling, typographical errors and provide clarity.

These amendments present no significant controversy and are either required by EPA, assistive to public water systems, or are minor changes.

The *Colorado Primary Drinking Water Regulations* are amended as follows:

Article 1

1. Section 1.5.2 is amended to adjust the definitions of Compliance Monitoring and Triggered Source Water Monitoring to provide clarity.

2. Section 1.6.4(e) is struck from the *Colorado Primary Drinking Water Regulations*.

Article 7

1. Section 7.4.17 is amended to include the definition of "module" from the federal language.

2. Section 7.7.2 is amended to include record keeping requirements from the federal language.

Article 9

1. Section 9.2.11 is amended to strike "mean *Cryptosporidium*". This provision applies only to unfiltered surface water systems which are not allowed in Colorado.

2. Table 9-7 Table of CPDWR Violations and Other Situations Requiring Public Notice is amended to correct public notice requirements regarding LT2 and include and adjust numbering of end notes from the federal language.

Article 10

1. Section 10.1.3 is amended to include requirements from the federal language for extended holding time for *E. coli* samples.

2. Section 10.7.4 is amended to correct a typographical error.

Article 11

1. Section 11.4 is amended for clarity.

Article 13

1. Section 13.2 is amended for clarity.

2. Section 13.4 is amended for clarity.

11.53 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: December 8, 2008; Effective Date January 30, 2009

The Colorado Revised Statutes (CRS), §25-1.5-202, provide specific authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

The Office of Legislative Legal Services (OLLS) raised concerns regarding subsections 4.6(c)(1), 4.6(c)(2), 4.6(c)(3)(iii)and 4.7(a) of Colorado's Primary Drinking Water Regulations. OLLS's concerns related to public meetings for small drinking water system variances. OLLS objected to language which provided for a meeting if there is "sufficient interest" in such a meeting. OLLS expressed the opinion that such language is vague, and may be inconsistent with and less stringent than corresponding federal requirements.

While the Commission and Division did not necessarily agree with OLLS's position, the Commission amended the cited subsections to resolve OLLS's concerns. The Commission deleted the "sufficient interest" language to address OLLS's vagueness concerns. New section 4.3(h) was added, which is identical to 40 CFR § 142.309(A), to address OLLS's concern that the regulations may contradict or be less stringent than the federal program. Subsection 4.7(a) was amended to include a provision that allows the Division to deny frivolous or insubstantial public meeting requests, consistent with 40 CFR § 142.44(c).

11.54 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: August 10, 2009 rulemaking; Effective Date December 1, 2009

Adoption of Revisions to Article 8 – Lead and Copper Control, with amendments to Articles 5, 6, 7, 9, 10 and 13 of the *Colorado Primary Drinking Water Regulations*.

The Colorado Revised Statutes (CRS), §25-1.5-202, provide specific authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as by the *Colorado Primary Drinking Water Regulations* under the direction of the Water Quality Control Division (Division). Colorado has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. However, in order to maintain primacy, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. By retaining primacy, the Division is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors.

The Commission amended Article 8, with minor amendments to Article 9 of the *Colorado Primary Drinking Water Regulations* to include:

- The provisions of the federal regulations as published in the Federal Register, Volume 72, Number 195, October 10, 2007, pages 57782 through 57820, National Primary Drinking Water Regulations for Lead and Copper: Short-Term Regulatory Revisions and Clarifications.

These amendments to Article 8 and Article 9 are summarized as follows:

- Revision to the minimum number of samples required
    - 8.2(c)(1) - Language was added to clarify that systems that have less than five taps are required to sample twice at one or more taps to meet the required number of sites.
- Revision concerning definitions for compliance and monitoring periods

  - 8.2(d)(4)(vi)(B) - Language was added which states that a large system would trigger two six-month periods of sampling if a lead action level exceedance occurred as well as a water quality parameter failure.

- Revisions concerning reduced monitoring criteria

  - 8.2(d)(4) Language was added to clarify that systems start the annual sampling during the calendar year immediately following the end of the six month sampling.

  - 8.2(d)(4)(ii) Language was also added requiring systems serving >50,000 to meet the lead action level as well as maintain water quality ranges in order to move to a reduced schedule.

  - 8.2(d)(4)(iii) Language was added regarding the requirement that systems on a three year schedule must sample every three years.

- Revisions concerning consumer notice of lead tap water monitoring results

  - 8.9(d)(2) This section requires all systems (whether they exceeded the action levels or not) to send a consumer notice of tap water monitoring results to the individuals that had their tap water tested for lead and copper compliance monitoring.

  - 9.1.4(d) There is new required health information in every Consumer Confidence Report that contains mandatory language regarding lead.

- Revisions concerning public education requirements

  - 8.9 The revision has struck most of the mandatory language and allows systems to author their own public education materials. The revision allows for Department pre-approval of public education materials before distribution. The revision requires submittal of the material to the Department before distribution.

  - 8.9(b)(1) The Department must determine whether or not there is a large portion of non-English speaking persons within a system.

  - 8.9(b)(2) Language was added specifying the end of the monitoring period as being the date from which the 60-day public education deadline starts.

  - 8.9(b)(2)(ii) Systems must contact local health agencies, in person or by phone, in order to obtain a list of target organizations.

  - 8.9(b)(3) Allowance for an extension for new public education delivery requirements. Extensions can be given if requested prior to the 60 day deadline.

- Revisions concerning public water system reporting requirements

  - 8.10 Requires that systems report all of their lead and copper tap water results by the 10th of the month following the monitoring period.

  - 8.10 Requires that changes in new sources and long term treatment changes to be reported to the Department as early as possible.

- Revisions concerning reevaluation of lead service lines

- 8.8(b)(2) Language was added regarding a system resuming the lead service line replacement program. The system must reassess the number of lead lines to include lead lines that were opted out previously because of sampling results. It divides the number of lead lines left by the number of years left in the program to obtain the amount needed to be replaced per year.

These amendments provide more effective protection of public health by reducing exposure to lead in drinking water and by strengthening the implementation of lead and copper control in the following areas: monitoring, treatment processes, public education, customer awareness, and lead service line replacement.

Additionally, the public health is served by a rule that is clear and as easy to read and understand as possible. Therefore, the Commission further amended multiple Articles of the *Colorado Primary Drinking Water Regulations* to include:

- Revisions to Article 8 to rearrange the order and flow of the sections to provide clarity

- Revisions to Article 8 and Article 10 to update references and to include cross referencing titles where this provides clarity.

- Numerous minor changes removing obsolete references and definitions that are not used within the regulation, and correction of identified spelling and typographical errors. The removal of obsolete references includes the removal of section 13.1(d). The Commission adopted section 13.1(d) in the July 14, 2008 rulemaking hearing to delay the effective date of the new groundwater rule provisions contained in 13.1, 13.3 and 13.4. The Commission's actions during this hearing will become effective December 1, 2009; accordingly section 13.1(d) is no longer necessary as compliance with these provisions will be required upon that effective date.

- Other identified changes include the following:

  - 5.4(a) the words “have a certified laboratory” are added concerning fecal coliforms/ *escherichia coli* (*E. coli*) testing

  - 6.1.3 is amended to clarify compliance with Maximum Contaminant Levels and Maximum Contaminant Level Goals for Inorganic Chemical Contaminants

  - 7.5.1 removes the reference to 7.5.4 since this section does not exist and adds the words “and the requirements of section 1.6.3(j)”

  - Sections 7.7 and 7.8 are amended to remove the word “you” and replace it with “the system”

  - 9.1.2 replaces the words “sells” with “delivers”, “buyer” with “consecutive”, “seller” with “wholesaler”, and “purchaser” with “consecutive”

  - 9.1.3(b)(1)(ii) adds the word “general”

  - “Table 10-10 Cited Detection Limits for Volatile Organic Chemical Contaminants” is added

  - Changes to Articles 1, 9, and 13 related to the Groundwater Rule. The following changes are required to assure that Colorado regulations are at least as stringent as the federal regulations in order to maintain primary enforcement authority:

- 1.6.3(o)(2) corrects reference to public notification requirements to include 9.1.3(h) and 9.2.13.

- 9.2.3(a)(4) Table 9-5 corrects Tier 2 public notice reference to include 13.4(b).

- 9.2.4(a)(6) Table 9-6 corrects Tier 3 public notice reference to include all of 13.4 and 11.4.

- 9.2.13 adds public notice requirements for non-community groundwater systems.

- Table 9-7 I.A.11 corrects violation citations to include 13.4(a), 13.4(b) and 11.4 as treatment technique violations with Tier 2 public notice. Also corrects violation citations to include 11.4 as a monitoring violation with Tier 3 public notice.

- 13.4(c)(3) adds reference to include 11.4(b).

- 13.4(b) adds a requirement that systems that are subject to compliance monitoring requirements will incur a treatment technique violation when a failure to provide 4-log treatment of viruses is not corrected within four hours.

PARTIES TO THE RULEMAKING

1. City of Boulder
2. Board of Water Works of Pueblo, Colorado

11.55 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: August 9, 2010 rulemaking; Effective Date November 30, 2010

Adoption of Amendments to Article 13 – Groundwater Rule, with amendments to Articles 1, 3, 5, 7, 9, and 10 of the *Colorado Primary Drinking Water Regulations*.

The Colorado Revised Statutes (CRS), §25-1.5-202, provide specific authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with §24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as by the *Colorado Primary Drinking Water Regulations* under the direction of the Water Quality Control Division (Division). Colorado has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. However, in order to maintain primacy, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. By retaining primacy, the Division is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors.

Article 13 (Groundwater Rule) of the *Colorado Primary Drinking Water Regulations* was adopted on 12/08/2008. While the majority of the provisions in Article 13 were required to maintain primacy and are based on federal language, Section 13.2 does not contain federal requirements and Colorado's primary enforcement authority was not contingent upon its adoption. The substance of Section 13.2 covers Colorado rules on the disinfection of groundwater sources and the rules for granting public water systems a waiver from disinfection requirements.

The Center for Disease Control has called providing safe drinking water one of the greatest public health achievements of the 20th century. Prior to 1908, no U.S. municipal water systems chemically disinfected drinking water. Consequently, waterborne diseases exacted a heavy toll in illness and death. Without chlorination or other disinfection processes, the public is at great risk of contracting waterborne diseases. Meeting the goal of clean, safe drinking water requires a multi-barrier approach that includes protecting raw source water from contamination, appropriately treating raw water, and ensuring safe distribution of treated water to consumers' taps.

Water-borne disease outbreaks have been common in Colorado dating back to the 1800s. As a result, mandatory disinfection of all water served to the public, including groundwater sources, has long been recognized by both the Colorado Board of Health and subsequently the Water Quality Control Commission as necessary for the protection of public health. This recognition predates the federal Safe Drinking Water Act. Disinfection of groundwater sources has always been included in mandatory disinfection requirements and Colorado has a regulatory history that views untreated groundwater as a potentially significant health hazard.

In November 1967, the Colorado Board of Health recognized that mandatory disinfection of drinking water served to the public was necessary to protect public health and the Board amended then existing regulations to include the requirement that “a sufficient amount of chlorine shall be added to the water to maintain a measurable chlorine residual at all points in the distribution system.” The Board also established, at that time, the ability of the Water Quality Control Division (WQCD) to grant groundwater systems a waiver from disinfection requirements if the system could demonstrate that their water was “reasonably safe and free from contamination.”

In 1977, the Board further strengthened disinfection requirements by adopting amendments that required systems to maintain a “free available chlorine residual of at least 0.2 mg/L at the extremities of the distribution system.” Amendments adopted in 1991, modified the requirement for maintaining a chlorine residual in the distribution system from 0.2 mg/L to maintaining a “detectable residual in at least 95% of the samples taken at the extremities of the distribution system.” An amendment requiring a residual disinfectant concentration in the distribution system measured “at the same time as total coliforms are sampled” was also added.

Based on the regulatory authority established in the 1967 amendments, WQCD issued disinfection waivers dating back over several decades. Concerns with the ongoing appropriateness of some of these existing waivers prompted the initiation of a waiver review process in 2007. This process resulted in the withdrawal of a number of disinfection waivers due to concerns over the system's ability to provide safe drinking water to the public.

Recently, two disease outbreaks associated with groundwater systems occurred in Colorado - the 2008 salmonella outbreak in Alamosa and the Skyline Ranch norovirus outbreak in 2007. The Alamosa outbreak was particularly serious due to the large number of people who were sickened and one death associated with this particular disease outbreak. Alamosa had a disinfection waiver at the time of the outbreak (which has since been withdrawn) and, as a result, the city's drinking water was not being disinfected. An extensive report was developed in the wake of the Alamosa outbreak. This report outlined a combined failure of physical, regulatory and human infrastructure all of which contributed to the outbreak.

After careful consideration, in particular, of the history of disinfection in Colorado, of the historical issuance of disinfection waivers, of the reality of continued disease outbreaks, and of growing concerns with the clarity of regulatory language, the amendments as described in this article (Article 25) were developed and adopted. These amendments reflect several conclusions. Retention of waivers is not appropriate except for systems that have shown a consistent, long-term history of operating in a manner that is fully protective of public health without the barrier of disinfection and can demonstrate continuing adherence to high standards of source and distribution system protection. Increased requirements and oversight of systems that continue to operate under disinfection waivers is appropriate. The issuance of waivers to new water systems poses too high a risk to public health given that new systems cannot clearly demonstrate a long-term history of being able to successfully operate without disinfection. Furthermore, it is not appropriate for systems that are currently providing chemical disinfection to discontinue such disinfection thereby removing a demonstrably effective primary barrier to microbial contamination. Systems serving populations susceptible to microbial contamination, specifically schools and day care centers, are unsuitable to operate without chemical disinfection due to the increased health risks these types of populations face.

For those systems that are required to disinfect, further conclusions were reached. Clarification of continuous chemical disinfection requirements was needed. Clarification of entry point and distribution system monitoring and compliance requirements was needed. It was recognized that systems providing only ultraviolet treatment as a means of disinfection are not providing sufficiently protective disinfection due to the inability of ultraviolet treatment to maintain a disinfection residual. It was recognized that there are inherent difficulties requiring hand pumped wells to maintain continuous disinfection due to their typically remote locations. Therefore, there was a need to establish criteria for proper operation, maintenance and monitoring of such wells. Finally, it was concluded that amendments clarifying the recordkeeping, reporting and public notice requirements for groundwater systems were needed.

These amendments clarify and expand upon long standing requirements of the *Colorado Primary Drinking Water Regulations*, and are in line with requirements that are already part of existing guidance and/or policy. The overall goal of these amendments is to further protect the public from microbial contamination and to enhance Article 13 regarding specific regulations that apply to groundwater systems. These amendments primarily revise the previously adopted Section 13.2 and add a recordkeeping section (Section 13.5) and a reporting section (Section 13.6).

Summary

Groundwater Disinfection Amendments. The Commission has amended the *Colorado Primary Drinking Water Regulations* concerning minimum treatment technique requirements for groundwater systems in the following ways. Requirements in Article 1 were redesignated to Article 9, a requirement to Article 5 was added and requirements were revised and added to Articles 9 and 13.

Primary Enforcement Responsibility Amendments. The Commission adopted amendments to the *Colorado Primary Drinking Water Regulations* in order to remain consistent with provisions of the National Primary Drinking Water Regulations which were amended to include revisions concerning approved analytical methods and revisions concerning compliance monitoring requirements. The federal provisions were published in the following Federal Registers:

The federal regulations as published in the Federal Register, Volume 74, Number 123, June 29, 2009, pages 30953 through 30959, National Primary Drinking Water Regulations: Minor Correction to Stage 2 Disinfectants and Disinfection Byproducts Rule and Changes in References to Analytical Methods

The federal regulations as published in the Federal Register, Volume 74, Number 216, November 10, 2009, pages 57908 through 57918, Expedited Approval of Alternative Test Procedures for the Analysis of Contaminants Under the Safe Drinking Water Act; Analysis and Sampling Procedures

The federal regulations as published in the Federal Register, Volume 74, Number 230, December 2, 2009, pages 63069 through 63070, Expedited Approval of Alternative Test Procedures for the Analysis of Contaminants Under the Safe Drinking Water Act; Analysis and Sampling Procedures

The revised analytical methods concerned microbial contaminants, surface water minimum disinfectant residuals, maximum disinfectant residuals, disinfectant byproducts, disinfectant byproducts precursors, and secondary maximum contaminates. These amendments added language to sections 3.4, and multiple sections of Article 10.

The revised compliance monitoring requirements concerned stage 2 disinfection byproducts routine monitoring. These amendments had to be adopted to maintain primary enforcement authority. These amendments revised Tables 7-29 and 7-33.

Additionally, the Commission adopted amendments removing Section 1.9.1(b) concerning consecutive public water systems in order to remain consistent with and at least as stringent as regulations adopted by the federal government.

Other Amendments to the *Colorado Primary Drinking Water Regulations*. The Commission adopted amendments to the *Colorado Primary Drinking Water Regulations* that added, corrected, removed or revised obsolete references and dates, spelling, typographical and reference errors. This was done to provide clarity and accuracy.

Groundwater Disinfection Requirements.

The Commission amended Articles 1, 5, 9 and 13 of the *Colorado Primary Drinking Water Regulations* to include the following requirements as summarized below:

- Groundwater disinfection requirements
    - Groundwater Source (13.1(a)(7-8), 13.2(a)(1),13.2(a)(2)(i), 13.2(b)(1), 13.2(b)(3) and 13.2(c)(1))
        - Establishes minimum treatment techniques requiring groundwater systems to disinfect a groundwater source at all times that the source is serving water to the public. The disinfection must include chemical treatment resulting in at least 0.2 mg/L residual disinfectant concentration in water entering the distribution system at the entry points.
        - Establishes weekly residual disinfectant concentration monitoring at all entry points serving groundwater to the public. The monitoring requirement increases to every 24 hours while the residual disinfectant concentration is below 0.2 mg/L.
        - Establishes a timeframe of 72 hours to correct a residual disinfectant concentration that is discovered to be below 0.2 mg/L, otherwise a treatment technique violation occurs.
        - Establishes that a groundwater system in violation of the treatment technique must resolve and document the situation, keep records, notify the Department and issue public notice.
        - Establishes when a system that is chlorinating needs to begin compliance with monitoring requirements.
        - Establishes when a system disinfecting with only ultra violet light must begin additional required chemical disinfection.

- Groundwater distribution system (13.2(a)(2)(ii), 13.2(b)(2), 13.2(b)(3) and 13.2(c)(2))
    - Establishes at least a detectable residual disinfectant concentration throughout the distribution system to be measured at the same point and time as total coliform.
    - Establishes residual disinfectant concentration cannot be undetectable in more than 5 percent of the measurements taken each monitoring period for any two consecutive monitoring periods, otherwise a treatment technique violation occurs.
    - Establishes that a groundwater system in violation of the treatment technique must issue public notice.

- Groundwater disinfection waiver requirements (9.2.12, 13.1(a)(1)(i), 13.1(a)(9), 13.1(a)(14), 13.2(d) and 13.5(a)(3))
    - Establishes that groundwater systems with a disinfection waiver prior to November 30, 2010, will continue to have a disinfection waiver and are not subject to groundwater disinfection requirements in 13.2(a-c).
    - Establishes that a groundwater system with a disinfection waiver that is determined to be a school or a daycare center will no longer have a disinfection waiver.
    - Establishes Department authority to revoke disinfection waivers from groundwater systems with susceptible populations.
    - Establishes that the Department will no longer issue new disinfection waivers.
    - Establishes that a groundwater system with a disinfection waiver must comply with the following:
        - Provide public notice that the system operates under a disinfection waiver.
        - Ensure that the system is operated by a certified operator.
        - Have emergency disinfection or an emergency disinfection plan.
        - Keep records of all chlorination activities.
        - Have a Monitoring Plan.
        - Protect their distribution system (Distribution System Protection Plan).
        - Protect their groundwater sources (Source Water Protection Plan).
    - Establishes Department authority to:
        - Evaluate any groundwater source or storage system using Department Design Criteria and CRS Well Construction Criteria.
        - Require sampling of any groundwater source.
        - Require sampling and proof that new groundwater sources are not contaminated.

- Perform a sanitary survey of the system at any time.
- Review the violation history of the system.
- Withdraw a waiver from a system with a fecally contaminated source.
- Withdraw the disinfection waiver.

- Establishes that the groundwater system has the right of appeal to a Department decision to withdraw a disinfection waiver.
  - Groundwater systems with hand pumped well requirements (5.1.1(e)(6), 9.2.14, 13.1(a)(1)(ii-iii), 13.2(e))

- Establishes that groundwater systems with hand pumped wells must comply with the following:
  - Operate according to Department guidance or Department approved alternative guidance.
  - Disinfect hand pumped wells before opening for the season.
  - Monitor for total coliform at least once a month.
  - Take a hand pumped well out of service if it is contaminated. The system must eliminate the contamination and disinfect the hand pumped well before the well can be put back into service.
  - Continuously post public notice whenever the hand pump well is available for public use. (9.2.14(b))

Primary Enforcement Responsibility Requirements.

The Commission amended Articles 1, 3, 7 and 10 of the *Colorado Primary Drinking Water Regulations* to revise or add the following requirements as summarized below:

- Consecutive System Requirements (1.9)
  - Removed Section 1.9.1(b). This section allowed for an exemption from regulation under the *Colorado Primary Drinking Water Regulations* for consecutive public water systems. This exemption made the *Colorado Primary Drinking Water Regulations* less stringent than regulations adopted by the federal government.

- Analytical methods (3.4, 10.1.3(c), 10.1.4(a))
  - Standard Methods 21st Addition approved for multiple methods.
  - Additional approved methods for residual chlorine analysis including On-Line Chlorine Analyzer EPA 334.0 and Test Strips Method D99-003.

- Stage 2 disinfection byproducts routine monitoring (Tables 7-29 and 7-33)

- Community and non-transient non-community water systems that serve only groundwater with a population less than 500 may take individual TTHM and HAA5 samples. Community and non-transient non-community water systems that serve surface water with a population less than or equal to 3,300 may take individual TTHM and HAA5 samples. All others must take dual sample sets.

Other Requirements of the *Colorado Primary Drinking Water Regulations*.

The Commission amended the *Colorado Primary Drinking Water Regulations* to add, correct, remove or revise the following requirements as summarized below:

- Monitoring Plan (1.12)
    - Public water system must submit one copy of the monitoring plan instead of two.
- Additional Analytical Methods (Article 10)
    - Section 10.12 and Table 10-30 was added.
    - First paragraph reference to Tables10-23 and 10-24 is corrected to be 10-24 and 10-27
- Sanitary Survey Frequency and Response to Significant Deficiencies or Violations of *Colorado Primary Drinking Water Regulations* in a Sanitary Survey Written Notice (11.2 and 11.4)
    - Language referencing December 1, 2009 is now obsolete and is removed.

Discussion Items.

These amendments to the *Colorado Primary Drinking Water Regulations* were developed in consultation with stakeholders. Stakeholders were provided opportunities to express concerns regarding particular provisions of the amendments and today's amendments have addressed many of those comments. The discussion below reflects conclusions of major comments.

Entry Point Monitoring:

These amendments were intended to achieve several levels of public health protection and required that all groundwater sources be disinfected at all times that they are used to serve water to the public and required that disinfection at least include one chemical treatment method. As a means to verify sufficient disinfection of the source entry point monitoring has been established. Since the amendments require the use of chemical disinfection, measurement of residual disinfectant concentration at each entry point to the distribution system ensures that chemical disinfection is being provided. Additionally, monitoring is required at entry points that have served water to the public during the monitoring period, meaning when water from a groundwater source is available to a consumer in any way, sampling is required at that source's entry point. Conversely, when no water enters the distribution system from a source or a number of sources that combine before entering the distribution system, then no monitoring is required to confirm that treatment is being delivered.

It is recognized that some groundwater systems operate continuous chlorine analyzers at the entry points to the distribution system. With a minimum monitoring requirement of once per week per entry point, it is apparent that monitoring more frequently meets this requirement. The amendments require action on behalf of the groundwater system when the system discovers that the residual disinfectant concentration falls below the minimum disinfectant level and therefore the system must be aware of this event. At a minimum, these systems must make themselves aware of the residual disinfectant concentration once a week. Although this will meet the minimum monitoring requirement, systems are required to take proper follow up action any time they become aware of a residual disinfectant concentration measurement that falls below the minimum. Additionally, systems must keep records of entry point compliance monitoring. Chart recordings and data logs meet this requirement as long as they record all pieces of information required by the recordkeeping requirements of the amendments and make note of the recordings they will use for compliance.

Minimum Entry Point Residual Disinfectant Concentration:

The amendments identify a minimum level of disinfectant of 0.2 mg/L of chlorine that must be maintained at the entry points to the distribution system. This level is appropriate as demonstrated in the history of the *Colorado Primary Drinking Water Regulations* as well as in requirements of the Surface Water Treatment Rule of 1989. The *Colorado Primary Drinking Water Regulations* have previously required 0.2 mg/L of residual disinfectant concentration at all points in the distribution system. In addition, at least 7 other states require at a minimum 0.2 mg/L residual disinfectant concentration throughout the entire distribution system. Additionally, given that a large percentage of groundwater sources contain known chlorine measurement interferences, establishing an entry point free chlorine residual requirement that is well above method detection limits, ensures that systems will be providing an actual free chlorine residual at least at the entry points to the distribution system.

Entry Point Treatment Technique Violation:

The amendments establish the point at which a system has violated the groundwater source treatment technique. Upon discovery of the insufficient residual disinfectant concentration the system must begin sampling the entry point every 24 hours until the residual disinfectant concentration is restored to at least 0.2 mg/L. Additionally, upon observing a measurement of the residual disinfectant concentration below 0.2 mg/L the system has 72 hours to restore the residual to at least 0.2 mg/L before the system incurs a treatment technique violation. It is the system's responsibility to notify the Water Quality Control Division when a treatment technique violation has occurred. Regular reporting of weekly entry point sampling data is not required unless the Water Quality Control Division identifies the need to collect and maintain this information (pursuant to Section 1.6.4).

Considering that treatment technique violations require Tier 2 public notification, it is considered burdensome to require that level of notification when disinfection has failed for only a short period of time if the water has not been identified as contaminated. However, extended periods where disinfection is not being applied (longer than 72 hours) does constitute an elevated level of public health risk that warrants a Tier II public notification. The 72 hour time period does allow for the system to make progress towards resolving the issue concerning the insufficient level of disinfectant as well as time to contact the Water Quality Control Division to request assistance and guidance.

Waivered Systems Introducing New sources:

Systems that have maintained a waiver from disinfection, just like many other water systems in Colorado, face issues of water scarcity and growing populations and therefore may require the addition of new sources to the system. Although, the amendments identify that issuing new waivers is not appropriate, systems that have shown a history of operating in a manner that is fully protective of public health without the barrier of disinfection may continue that operation with the addition of new groundwater sources that are shown to be free of contamination and properly constructed.

Systems that wish to maintain a waiver from disinfection cannot add a groundwater source that is contaminated or comes from a well that has been improperly constructed. Furthermore, the addition of a source that is a surface water source or is identified as a groundwater under the direct influence of surface water source will result in immediate waiver withdrawal.

11.56 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: November 4, 2013 rulemaking; Final Action December 9, 2013; Effective Date March 1, 2014

The provisions of the Colorado Revised Statutes, section 25-1.5-202, provides specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

The Water Quality Control Commission (the "Commission") has adopted a revised version of the *Colorado Primary Drinking Water Regulations* (CPDWR), 5 CCR 1002 -11 with the objective of improving clarity and readability. The revised version replaces the CPDWR 5 CCR 1003-1 effective November 30, 2010 which has been repealed in this rulemaking. The changes to the CPDWR are not substantive and are not intended to create any new or different requirements for public water systems. The revisions are intended to make the CPDWR easier to understand, comply with, and implement. Additionally, public health is better served by regulations that are clear and as easy to read and understand as possible.

This rulemaking was in response to longstanding issues with interpretation and comprehension of the previous regulations. It also is in response to and complies with a State executive order regarding improving regulations and regulatory review. Colorado Governor John Hickenlooper's Executive Order D 2012-002 - Regulatory Efficiency Reviews orders that "agencies shall consider whether each rule: 1. Is necessary and does not duplicate existing rules; 2. Is written in plain language…".

As a result, the Commission simplified and clarified the language of the CPDWR by applying acknowledged plain language and reader expectation principles, including: shorter sentences, active voice, consistent terms, and proper definitions, among other useful tools. In the revisions the Commission applied the use of the terms "must" and "shall" in different and purposeful ways. "Must" means a person or thing is required to meet a condition for a consequence to apply and is used in regards to requirements the supplier is required to comply with. "Shall" means a person has duty to do something and is used in regards to Department action. These writing style changes make the CPDWR more transparent and easier to consistently interpret. While it was the Commission's intent not to change the substantive meaning of the regulations in this rulemaking, in cases where there was ambiguity the revised language reflects the Commission's interpretation of the previous regulations based on EPA guidance documents and the experience of the Commission and its staff.

In an effort to provide clarity and accuracy the following revisions were also made:

- Removed outdated requirements
- Added missing references
- Corrected or removed obsolete references
- Removed obsolete dates
- Corrected spelling and typographical errors

The Commission maintained the overall structure of the CPDWR which is organized in multiple sections by rule. The previous version of the CPDWR contained articles that covered multiple rules. The revised CPDWR was renumbered to be consistent with other Commission regulations. This revision creates shorter, more focused sections which in turn allow readers to more easily comprehend the content of each section. Certain articles and content were eliminated by directly referencing federal language (i.e., BATs and analytical methods). As a result, the total page count has been reduced by nearly 20 percent.

Within each rule, the Commission reorganized the requirements in a logical and chronological order. This new structure is consistent throughout the revised CPDWR so that readers can easily discern applicable requirements.

These amendments to the CPWDR were developed in consultation with stakeholders. Stakeholders were provided multiple opportunities to express comments and concerns regarding the drafts of these revisions. These revisions have addressed all of those comments. An advisory group of diverse stakeholder volunteers assisted in detailed reviews of all the language adopted in these revisions.

Colorado Springs Utilities (“Utilities”) raised legitimate issues related to the Cross-Connection Control Rule in its Responsive Prehearing Statement to this rulemaking. The Water Quality Control Division (“Division”) was only able to resolve some of Utilities' concerns because many of the issues raised by Utilities were outside of the scope of this rulemaking. As such, the Commission is providing this information in order to clarify its intended interpretation of the Cross-Connection Control Rule until it is revised in a future rulemaking hearing:

- The definition of Cross-Connection does not apply to cross-connections inside a consumer's water system. In the CPDWR “Cross-Connection” is defined as any connection that could allow flow that does not meet drinking water standards into the public water system from either a consumer's water system, a pipe, or a plumbing fixture. Any connections that do not connect directly to the public water system and therefore could not allow water to flow into the public water system, do not fall within this definition.

- The CPDWR have requirements that apply to all cross-connections, and additional specific requirements that apply only to service cross connections. This distinction was often overlooked and as result a definition was added for Service Cross Connection to make the distinction more evident. The CPDWR requires the supplier to comply with both the requirements of sections 11.37(2)(b) and 11.37(3)(b). The requirements of section 11.37(2)(b) apply to all types of cross-connections, whereas the requirements of section 11.37(3)(b) apply only to service cross connections.

- The Division has explained its expectations on how cross connections should be controlled in its guidance “Water Quality Control Division, Quick Guide to Non-Community Public Water System Cross-Connection Control.” The guidance explains, “[t]o ensure the device is consistent with the degree of hazard[,] [t]he Department expects that cross-connections be controlled with: air gaps, reduced pressure zone assemblies (RPZ,), pressure vacuum breakers (device shall not be subject to back pressure), double check valve assemblies (in instances where there is not adequate drainage for a RPZ or is subject to flooding or where retro fits create an unreasonable burden) or where the device is installed in accordance with the local jurisdictional plumbing code. The Department highly recommends that devices should be either ASSE or USC-FCCC&HR certified.”

- The supplier has various options to ensure that control device testing is conducted annually. Several communities have met this requirement by supplier-provided testing, billing the customer for testing, or termination of water service in the event of failure to test, as examples.

The *Colorado Primary Drinking Water Regulations* are amended as follows:

All requirements from the November 30, 2010 CPDWR have been repealed.

The requirements in these revisions are intended to be a complete and accurate replacement for the requirements of the previous 2010 CPDWR.

In order for the State of Colorado to maintain primacy over implementing the Safe Drinking Water Act, the Commission must adopt regulations that are no less stringent than the National Primary Drinking Water Regulations. The intent of this rulemaking was to not diminish stringency, especially concerning any provisions that are adopted to maintain primacy

In the past, the Commission has also adopted Colorado-specific requirements. It is the intent of the Commission that the revisions adopted in this rulemaking did not diminish the stringency of these Colorado-specific provisions.

If it is determined in the future that there has been a diminishment in stringency or other unintended substantive change, the Commission is prepared to amend the regulations in a timely manner to meet the intent of this rulemaking.

PARTIES TO THE RULEMAKING

1. Denver Water
2. City of Colorado Springs and Colorado Springs Utilities
3. City of Boulder
4. Colorado Water Utility Council

11.57 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: January 12, 2015 rulemaking; Final Action March 10, 2015; Effective Date May 1, 2015

The following sections were affected by this rulemaking hearing: Adoption of 11.16 – Revised Total Coliform Rule, 11.28 – Storage Tank Rule, 11.39 – Backflow Prevention and Cross Connection Control Rule, and 11.41 – Water Hauler Rule, with amendments to Sections 11.3(38), 11.4(2), 11.5(3)(a)(iv)(A)(V), 11.8(3)(f)(iii), 11.11(3)(c)(i)(B), 11.11(3)(c)(iii), and 11.11(3)(d)(iii). The provisions of the Colorado Revised Statutes (CRS), section 25-1.5-202, provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

Background

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as regulations adopted by the Water Quality Control Commission. Colorado, with the Colorado Department of Public Health and Environment (the Department) as the administering agency, has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. The Water Quality Control Division (Division) is part of the Department and is responsible for implementing and enforcing the drinking water regulations that are adopted by the Commission and applicable regulations adopted by the Board of Health. In order to maintain primacy from the EPA, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. In this rulemaking the Commission is adopting the Revised Total Coliform Rule which is no less stringent than the federally-mandated Revised Total Coliform Rule. By retaining primacy, the Department is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors.

In addition to adopting the federally-mandated Revised Total Coliform Rule to maintain primacy, this rulemaking also included Colorado-specific requirements for storage tanks, backflow prevention and cross connection control, water haulers, minimum chlorine residual disinfectant concentration in the distribution system, and various other editorial revisions and clarifications. The Commission adopted these revisions to address outstanding waterborne disease outbreak reduction strategies that were developed as a result of the Salmonella outbreak in Alamosa in 2008. As published in the November 2009 report "Waterborne Salmonella Outbreak in Alamosa, Colorado March and April 2008" the following strategies were identified and were addressed with these amendments:

- Revise regulations associated with controlling hazardous cross connections at water systems;
- Enhance oversight of total coliform sampling, water storage, and distribution systems during inspections, and collect inventory information on these facilities;
- Ensure compliance with the requirement for water systems to maintain residual chlorine levels in water distribution systems.

Additionally, with this rulemaking, the Commission adopted the federal revisions to the definition of "lead free" as specified in the Federal Reduction of Lead in Drinking Water Act.

Policies, Handbooks and Guidance and Regulation 11

The Division originally adopted WQCD Policy Number 1, *Implementation Policy Framework* (Policy 1) in November 2010 and the associated *Procedure* 1 in August 2012; both were prepared in accordance with the Colorado Administrative Procedures Act, Article 4, Title 24 of the CRS.

The Commission adopts regulations that create binding norms or legal obligations of the Department or regulated entities. The Department may develop implementation policies and guidance/handbooks where implementation of Regulation 11 may require interpretation, decision-making flexibility, or a stream-lined approach for meeting compliance requirements.

These amendments to Regulation 11 include references to guidance/handbooks that the Department intends to develop as part of ongoing implementation of Regulation 11.

Policy 1 specifically states that implementation policies and associated procedures are not binding regulations and are not to be applied as such. The referenced guidance/handbooks in these amendments are not requirements. Violations or other notices of non-compliance cannot be issued against a policy or guidance/handbook. Violations or other notices of non-compliance can, and will, only be issued for a failure to comply with Regulation 11 or an applicable statute (law) included in the CRS. Implementation policies and guidance/handbooks have no compliance expectation.

Revised Total Coliform Rule

The Commission replaced the Total Coliform Rule in section 11.17 with the Revised Total Coliform Rule in section 11.16. The Revised Total Coliform Rule increases public health protection by requiring a more proactive approach to identifying and fixing issues that make the distribution system vulnerable to microbial contamination, and therefore provide incentives for improved water system operation. The Revised Total Coliform Rule includes the following provisions of the federal regulations as published in the Federal Register, Volume 78, Number 30, February 13, 2013, pages 10270 through 10365, National Primary Drinking Water Regulations:

- Additional definitions and recordkeeping and reporting requirements.
- Treatment technique triggers for Level 1 and Level 2 assessments.

- Additions to the written sampling plan as part of the monitoring plan requirements in section 11.5.
- Start-up procedures for seasonal systems.
- Reporting requirements for *E. coli*-positive special purpose samples.
- Increased routine sampling requirements for non-community groundwater systems supplying less than or equal to (≤) 1,000 people.
- Level 1 and Level 2 assessments.
- Treatment technique violations.
- Additional public notification requirements.

The amendments adopted by the Commission remain as stringent as the federal requirements for the Revised Total Coliform Rule while also establishing requirements that are more protective of public health. Examples of these requirements include the following:

- No allowance for reduced monitoring. Colorado did not adopt the allowance for reduced monitoring in the federal Total Coliform Rule and therefore not allowing reduced monitoring has historically been the Department's practice. Reducing the number of samples collected reduces the likelihood of detecting total coliforms and *E. coli*.
- No waivers will be granted from collecting three routine samples in the month following a total coliform-positive sample result. Collecting these additional routine samples helps identify whether the contamination is still present or if the previous month's activities fixed the problem. Granting a waiver from collecting these samples reduces the likelihood of detecting a persistent issue.
- No allowance for the supplier to forgo *E. coli* testing on a total coliform-positive sample in exchange for assuming that the sample is *E. coli*-positive. Certified laboratories automatically test total coliform-positive samples for *E. coli*. Also, having these data allow the Department to direct the appropriate follow-up activities in response to an *E. coli*-positive sample result.
- Adding a requirement that any special purpose sample that is *E. coli*-positive and is representative of water in the distribution system must be submitted to the Department but will not be used for compliance. This information will alert the Department to the potential of an acute contamination event and allow the Department to respond if necessary.

Minimum Distribution System Residual Disinfectant Concentration

The Centers for Disease Control and Prevention has called providing safe drinking water one of the greatest public health achievements of the 20th century. Colorado has long recognized the use of mandatory disinfection and the maintenance of a chlorine residual throughout distribution systems as necessary for the protection of public health from waterborne diseases. The Commission and the Department agree that the intent of the regulations has always been to actually have a chlorine residual present throughout all distribution systems.

Recently, two disease outbreaks occurred in Colorado - the 2008 salmonella outbreak in Alamosa and the Skyline Ranch norovirus outbreak in 2007. The Alamosa outbreak was particularly serious due to the large number of people who were sickened and one death associated with this particular disease outbreak. Alamosa had a disinfection waiver at the time of the outbreak (which has since been withdrawn) and, as a result, the city's drinking water was not being disinfected and the distribution system maintained no disinfectant residual. An extensive report was developed in the wake of the Alamosa outbreak. This report outlined a combined failure of physical, regulatory and human infrastructure all of which contributed to the outbreak. A key recommendation of this report was that all distribution systems should maintain appropriate disinfectant residual to maintain the final barrier to protect public health.

The Department presented evidence of the occurrence of *E. coli* within drinking water samples and found that there exists over a 300 percent rise in probability of a bacteria sample having *E. coli* when the chlorine residual is less than 0.2 mg/L. Furthermore, between eight and ten percent of samples taken in Colorado are at or below the proposed disinfectant residual limit.

Given the history and statewide practices of distribution system residual maintenance, the threat of waterborne illness, and to protect public health the Commission adopted a minimum allowable residual disinfectant concentration in the distribution system of 0.2 mg/L. The value of 0.2 mg/L includes only one significant digit and therefore any measurement of 0.15 mg/L or greater is compliant with this requirement.

These amendments replace the federal requirements for surface water systems and the Colorado-specific requirements for groundwater systems to maintain a detectable residual disinfectant concentration in the distribution system. The adopted minimum requirement for residual disinfectant concentration in the distribution system of 0.2 mg/L remains no less stringent than the federal standard of a detectable residual disinfectant concentration. The overall goal of these amendments is to further protect the public from microbial contamination and to correct the practice of maintaining less than a reasonable amount of chlorine in distribution systems. Amendments were made to sections 11.8, 11.11, 11.33 and 11.34.

The amendments included the following provisions:

- Replacement of the requirement that the disinfectant residual 'not be undetectable' with the requirement that public water systems maintain a minimum of 0.2 mg/L in the distribution system sampled at the same time as total coliform samples for all public water systems that are required to disinfect in sections 11.8 and 11.11.

- Establishment of a treatment technique violation for failure to comply with the minimum residual disinfectant concentration for only one monitoring period and maintenance of federal violation for failure to comply with the minimum residual disinfectant concentration for two consecutive monitoring periods in sections 11.8 and 11.11.

- Specific language requirements for public notification and consumer confidence reports in sections 11.33 and 11.34 when violations occur.

Backflow Prevention and Cross-connection Control Rule

The Commission amended Regulation 11 to include regulatory requirements for backflow prevention and cross-connection control in section 11.39 that replaces the Cross-connection Control Rule in section 11.37. The Cross-connection Control Rule in section 11.37 was written approximately 30 years ago and provided compliance challenges for public water systems, and for Department staff to determine and assure compliance. The Cross-connection Control Rule in section 11.37 required 100 percent compliance with annual cross connection control device testing requirements. Very few public water systems were able to comply with this unrealistic requirement. These amendments address many outstanding issues with the 30 year old rule including issues brought up by stakeholders during the November 2013 rulemaking; the amendments included the following provisions in sections 11.39, 11.33, and 11.36:

- Development of a written backflow prevention and cross-connection control program.
- Required notification to the Department of any suspected or confirmed backflow contamination event.
- System survey requirements to determine if cross connections are present including a five year compliance schedule for public water systems to build toward full compliance.
- Installation of backflow prevention assemblies or methods on uncontrolled cross connections.
- Annual backflow prevention assembly testing requirements to determine if assemblies are properly functioning including a five year compliance schedule for public water systems to build towards full compliance.
- Annual backflow prevention method inspection requirements to determine if methods are properly functioning.
- Development of an annual backflow prevention and cross-connection control program report.
- Specific language requirements for public notification in section 11.33 when violations occur.
- Recordkeeping requirements.

In considering the above revisions to the Backflow Prevention and Cross-connection Control Rule, the Department took into consideration many of the stakeholder comments. Specifically, stakeholders felt that they should have latitude to develop alternative compliance schedules for controlling cross connections or for surveying their system. The adopted revisions reflect these stakeholder recommendations. In addition, the stakeholder community agreed that the cross connection rule is difficult to implement in either form, and so they concurred with the five year timeline to move into full compliance with the regulation with increasingly stringent performance each year. Stakeholders agreed with lessening the 100 percent compliance requirement to 90 percent compliance after the five year ramp-up period.

Through oversight of the cross connection control program the Division has discovered that many industrial facilities, including domestic wastewater treatment works, have cross connections within their facilities. The internal plumbing of these facilities is not covered by the plumbing code. These cross connections pose a serious health risk to both the employees at these facilities and also visitors to the facilities. The Division believes it is a best industry practice for these facilities to inspect the plumbing within their facilities and as soon as possible control or remove any cross connections.

Storage Tank Rule

The Commission amended Regulation 11 to include regulatory requirements for the inspection of finished water storage tanks in the Storage Tank Rule in section 11.28. Storage tanks are infrastructure assets that require inspections and maintenance throughout their useful life. While EPA discussed including storage tank requirements when developing the Revised Total Coliform Rule, it ultimately did not directly address storage tank inspection and maintenance in the final Revised Total Coliform Rule. The Commission believes that the Storage Tank Rule provides increased public health protection, since storage tanks that lack inspection and maintenance can present a pathway for microbial contamination.

One person died and 1,300 people got sick during the Alamosa outbreak including about 40 percent of the infants in the city. The outbreak cost millions of dollars and storage tank defects were the likely cause of that outbreak.

The rule is in response to the 2008 Alamosa outbreak as well as hundreds of preventable significant deficiencies that have been identified at storage tanks during sanitary surveys since 2008. The Storage Tank Rule makes it clear that uncorrected sanitary defects in storage tanks are violations and suppliers are required to develop and implement a plan to properly inspect and maintain their storage tanks. This rule is a measured, flexible and appropriate response that was developed with stakeholders and represents best practices that are already in place at many Colorado public water systems.

The adopted revisions, in response to stakeholder concerns, only apply to finished water storage tanks. The Commission believes that raw groundwater tanks and finished water clearwells may still need to be regulated; however the Department will evaluate the need for this as it implements the Storage Tank Rule.

The amendments included the following provisions in sections 11.28, 11.33, and 11.36:

- Development of a written plan for storage tank inspections.
- Requirements to conduct periodic and comprehensive inspections of all finished water storage tanks.
- Requirements to correct sanitary defects identified during periodic and comprehensive inspections.
- Specific language requirements for public notification in section 11.33 when violations occur.
- Recordkeeping requirements.

Water Hauler Rule

The Commission amended Regulation 11 to include regulatory requirements for water haulers which are defined as public water systems that transport drinking water using a vehicle, in section 11.41. On November 26, 1976 EPA published EPA Water System Guidance 6A: “Applicability of the Safe Drinking Water Act to Water Haulers” that clarified that water haulers are public water systems under the Safe Drinking Water Act and therefore are subject to the National Primary Drinking Water Regulations. In May, 1986 the Water Quality Control Division adopted policy DWT-8: “Monitoring Requirements for Water Haulers” to establish specific requirements for water haulers which address their unique drinking water operations. In addition to the policy, the Department has historically applied Regulation 11 to these types of public water systems. The amendments adopted in this rulemaking add regulatory requirements to address the unique operations of water haulers. It is not intended that water haulers not previously regulated will be regulated as a result of these amendments but the Commission does believe that the addition of these requirements to the regulations, instead of in policy, will make the water hauler industry more aware of the applicability of Regulation 11 to their industry.

The amendments adopted include many aspects of policy DWT-8 as well as provisions to comply with Department-approved operational standards.

The amendments included the following provisions in sections 11.16, 11.17, 11.36, and 11.41:

- Total Coliform Rule monitoring.
- Residual disinfectant concentration monitoring.
- Compliance with an Operational Plan.
- Recordkeeping requirements.

During the stakeholder process, water haulers were generally in agreement with the proposed rule. Based on stakeholder input, the adopted revisions include terminology that is consistent with and understood by the water hauler community.

Additional Amendments

The Commission made the following amendments to be consistent with Department practices, to add clarity, or update outdated requirements:

- 11.3(38) - Revisions to the lead free definition to be consistent with the new Federal Reduction of Lead in Drinking Water Act.
- 11.4(2) – Revisions to the siting requirements for waterworks.
- 11.5(3)(a)(iv)(A)(V) - Revisions to the requirements for master meters to be included in the monitoring plan.
- 11.8(3)(f)(iii) – Removal of the allowance for the supplier of a surface water system to not submit entry point chlorine residual measurements.
- 11.11(3)(c)(i)(B), 11.11(3)(c)(iii), and 11.11(3)(d)(iii) – Removal of the allowance for the supplier of a groundwater system to use membrane filters for virus treatment credit.
- All requirements incorporated by reference from 40 CFR 141 were updated to reference 40 CFR 141 as amended on July 1, 2014.
- Typographical errors, renumbering, and updated cross references were revised as necessary throughout Regulation 11.

PARTIES TO THE RULEMAKING

1. City of Boulder
2. City of Colorado Springs and Colorado Springs Utilities
3. Reliable Field Services
4. Colorado Water Utility Council
5. City of Aurora

11.58 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: April 9, 2018; Final Action May 7, 2018; Effective Date June 30, 2018

The following sections were affected by this rulemaking hearing: 11.2 – Definitions, Acronyms, and Abbreviations, 11.5 – Monitoring Plan Rule, 11.8 – Surface Water Treatment Rule, 11.11 - Groundwater Rule, 11.13 – Groundwater Rule: Disinfection Waivers, 11.16 - Revised Total Coliform Rule, 11.17 Total Coliform Rule, 11.23 – Maximum Residual Disinfectant Levels Rule, 11.28 – Storage Tank Rule, 11.33 – Public Notification Rule, 11.34 – Consumer Confidence Report Rule, 11.36 – Recordkeeping Requirements Rule, 11.37 – Cross-Connection Control Rule, 11.39 – Backflow Prevention and Cross-Connection Control Rule, 11.43 – Variances and Exemptions Rule, and 11.45 MCLs, MCLGs, SMCLs, MRDLs, MRDLGs, and Action Levels. The provisions of the Colorado Revised Statutes (CRS), section 25-1.5-202, provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

Revisions to the Revised Total Coliform Rule (RTCR)

The Commission revised the Colorado Primary Drinking Water Regulations in 2015 to include the Revised Total Coliform Rule, as part of the Colorado Department of Public Health and Environment's federally-mandated primacy agreement with the United States Environmental Protection Agency (EPA). Additionally, the 2015 rulemaking included Colorado-specific requirements for storage tanks, backflow prevention and cross-connection control, water haulers, minimum chlorine residual disinfection concentration in the distribution system, and various other editorial revisions and clarifications.

The Department's Water Quality Control Division submitted its Revised Total Coliform Rule primacy to the EPA in June 2015. As part of its review, the EPA granted the Department temporary primacy due to concerns about missing regulatory language/requirements. For this rulemaking, in order to address the EPA's comments to obtain full primacy for the Revised Total Coliform Rule and to provide additional clarity and accuracy, the Commission has made the following revisions:

- Removed outdated requirements;
- Removed outdated references;
- Added missing references;
- Corrected or removed obsolete references;
- Reorganized the structure of 11.16 Revised Total Coliform Rule for increased clarity; and
- Moved the operator certification requirements from 11.8 – Surface Water Treatment Rule to 11.16 – Revised Total Coliform Rule.

Revisions to Cross-Connection Control Rule (Regulation 11.39)

In 2015, the Commission also amended Section 11.39 of the Colorado Primary Drinking Water Regulations' Backflow Prevention Cross-Connection Control Rule to further protect public health and public water systems from potential contamination associated with cross-connections and ensure public water system compliance with Section 25.1.114 & 25.1.114.1 of the Colorado Revised Statutes. The Water Quality Control Division committed during the rulemaking process to continue to engage with stakeholders, solicit input and further evaluate the adopted rule, while providing appropriate protection of the public health and public water systems.

The intent of the cross-connection portion of the rulemaking is to provide additional flexibility to water systems while continuing to protect public health and public water systems from potential contamination associated with cross-connections. Prior to this rulemaking, Section 11.39 of the Backflow Prevention Cross-Connection Control Rule required that all non-single-family-residential connections be evaluated for potential cross connections or that such connections be controlled appropriately. Stakeholders throughout the state expressed concern that certain types of multi-family-residential connections present a similar risk to the public water system as single-family-residential connections and should not be required to be evaluated for cross connections. The stakeholder community and the Water Quality Control Division have held two stakeholder meetings in September of 2017 to evaluate the apparent risks to the public water system from single-family-residential-service connections, and multi-family-residential connections. Based on the stakeholder process, the impact to public health and public water systems, and considerations including the applicable plumbing codes (Colorado Plumbing Code), and the volume of water in the service connections, the Water Quality Control Division proposed to adopt language in this rulemaking which considers duplex-residential connections as single-family-residential connections.

The Commission agrees with the Water Quality Control Division that single-family-residential connections and duplex-residential connections generally present a similar risk to a public water system' distribution system and it is reasonable to consider duplex-residential connections as single-family-residential connections for the purpose of this rule. The Commission also deleted the former Cross-Connection Rule (Regulation 11.37) because it is outdated and no longer applicable.

Updated Date for Federal Regulations Incorporated by Reference

The Commission also updated the date of the EPA regulations incorporated by reference throughout the Colorado Primary Drinking Water Regulations. To do this, the Commission deleted specific references to dates of EPA regulations throughout the Colorado Primary Drinking Water Regulations and added a new section to Regulation 11.2(6) which makes April 9, 2018 the effective date of all incorporated EPA regulations.

PARTIES TO THE RULEMAKING

1. City of Boulder
2. Dominion Water and Sanitation District
3. Parker Water and Sanitation District

11.59 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: November 13, 2018 Decision; Effective Date December 30, 2018

The following section was affected by this rulemaking hearing: 11.2(6) – Materials Incorporated by Reference. The provisions of the Colorado Revised Statutes (CRS), section 25-1.5-202, provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission made changes to section 11.2(6) (Materials Incorporated by Reference) in order to comply with section 24-4-103 (12.5) (a)(IV), C.R.S. of the Colorado Administrative Procedure Act, which requires a statement explaining where copies of the federal code incorporated by reference are available from the agency of the United States originally issuing the code.

Regulation 11 incorporates by reference requirements promulgated by the U.S. Environmental Protection Agency in the Code of Federal Regulations. Therefore to comply with §24-4-103 (12.5)(a)(IV), C.R.S., the Commission added an entirely new paragraph in section 11.2(6)(b), providing that: "The requirements promulgated by the U.S. Environmental Protection Agency incorporated by reference are available at no cost in the online edition of Code of Federal Regulations (CFR) hosted by the United States Government Printing Office, online at www.govinfo.gov." The Commission also made related changes to the original paragraph in 11.2(6)(b) for purposes of clarifying where to find the other materials incorporated by reference.

11.60 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: March 9, 2020; Final Action March 9, 2020; Effective Date April 30, 2020.

The following sections were affected by this rulemaking hearing: Regulation 11 Table of Contents, 11.2 – Definitions, Acronyms, and Abbreviations, 11.8 – Surface Water Treatment Rule, 11.11 - Groundwater Rule, 11.16 - Revised Total Coliform Rule, 11.23 – Maximum Residual Disinfectant Levels Rule, 11.33 – Public Notification Rule, 11.34 – Consumer Confidence Report Rule, 11.36 – Recordkeeping Requirements Rule, 11.37 – Cross-Connection Control Rule, 11.39 – Backflow Prevention and Cross-Connection Control Rule, 11.43 – Variances and Exemptions Rule, and 11.45 MCLs, MCLGs, SMCLs, MRDLs, MRDLGs, and Action Levels. The provisions of the Colorado Revised Statutes (CRS), section 25-1.5-202, provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), C,R,S,, the following statement of basis and purpose.

BASIS AND PURPOSE

Revisions to the Revised Total Coliform Rule (RTCR)

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as regulations adopted by the Water Quality Control Commission. Colorado, with the Colorado Department of Public Health and Environment (the Department) as the administering agency, has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. The department submitted its initial Revised Total Coliform Rule (RTCR) primacy package to the EPA in June 2015. As part of its review, EPA only granted the department "temporary primacy" due to concerns about missing regulatory language and requirements in the Department's RTCR. The department has worked continuously with EPA between 2017 to date to resolve any issues to allow for Colorado to be granted full primacy.

In order to address EPA's comments and for the department to obtain full primacy for the RTCR, the commission modified the drinking water regulation to increase clarity and accuracy in accordance with EPA's concerns. The modifications were minor and do not change any underlying requirements.

Revisions included:

- Adding cross-references to the RTCR and Ground Water Rule (Sections 11.11. and 11.16).
- Improving definitions related to RTCR (e.g., triggered assessments and seasonal systems) in Section 11.3.
- Adding clarifying language to RTCR (Section 11.16).
- Clarifying RTCR-related requirements in the Surface Water Treatment Rule (Section 11.8)

- Adding clarifying language, consolidating health effects language for public notification, and adding "recordkeeping" to the Tier 3 public notice table in Section 11.33 (Public Notification Rule).

- Adding RTCR-related clarifying language, adding cross-references, and consolidating the table of regulated contaminants in Section 11.34 (Consumer Confidence Report (CCR) Rule).

- Adding RTCR-related clarifying language and cross-references to Section 11.43 (Variances and Exemptions Rule).

- Correcting the RTCR table of contents for formatting issues.

- Adding a RTCR and GWR-related reference column to the MCLs and MCLGs microbial table in Section 11.45 (MCLs, MCLGs, SMCLs, MRDLs, and Action Levels).

One additional correction was made to Section 11.39 for the Backflow Prevention and Cross-Connection Rule. A minor modification was made to correct a typographical error in reference 11.39(1).

11.61 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: August 10 2020; Final Action August 10, 2020; Effective Date September 30, 2020

The following sections were affected by this rulemaking hearing: Regulation 11 Table of Contents, 11.28 – Storage Tank Rule, 11.33 – Public Notification Rule, 11.38 – Sanitary Survey Rule, 11.39 – Backflow Prevention and Cross-Connection Control Rule. The provisions of the Colorado Revised Statutes (CRS), section 25-1.5-202, provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

Background

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as regulations adopted by the Water Quality Control Commission. Colorado, with the Colorado Department of Public Health and Environment (the Department) as the administering agency, has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. The Water Quality Control Division (Division) is part of the Department and is responsible for implementing and enforcing the drinking water regulations that are adopted by the Commission and applicable regulations adopted by the Board of Health. In order to maintain primacy from the EPA, states must also promulgate new regulations that are no less stringent than those adopted by the federal government. In the 2015 rulemaking when the Commission adopted the Revised Total Coliform Rule, the commission included Colorado-specific requirements for storage tanks, backflow prevention and cross connection control, water haulers, minimum chlorine residual disinfectant concentration in the distribution system, and various other editorial revisions and clarifications. The Commission adopted these revisions primarily to address outstanding waterborne disease outbreak reduction strategies that were developed as a result of the Salmonella outbreak in Alamosa in 2008. As published in the November 2009 report "Waterborne Salmonella Outbreak in Alamosa, Colorado March and April 2008" the following strategies were identified and were addressed with the 2015 rule amendments:

- Revise regulations associated with controlling hazardous cross connections at water systems;

- Enhance oversight of total coliform sampling, water storage, and distribution systems during inspections, and collect inventory information on these facilities;

- Ensure compliance with the requirement for water systems to maintain residual chlorine levels in water distribution systems.

Since 2016, the Division has regulated cross connections (Section 11.39) and finished water storage tanks (Section 11.28) under the new regulations. During the last four years of implementation, the Division worked with stakeholders to understand the effectiveness of the rules. Based on this work, the Division proposed adjusting regulatory requirements based both on the Division's and water systems' implementation of the rules. The Commission agrees that these adjustments will allow a more even and reasonable approach to implementing the rules and allow water systems and the Division to focus resources on public health protection.

Revisions to the Storage Tank Rule (Regulation 11.28)

In 2015, the Commission added Section 11.28 of the Colorado Primary Drinking Water Regulations to include the Storage Tank Rule to further protect public health and public water systems from potential contamination associated with unprotected storage tanks within the public water system's drinking water distribution system. The Water Quality Control Division committed during the rulemaking process to continue to engage with stakeholders, solicit input and further evaluate the adopted rule, while providing appropriate protection of the public health and public water systems.

The intent of the storage tank inspections portion of the rulemaking is to provide additional flexibility to water systems while continuing to protect public health and public water systems from potential contamination associated with storage tanks. Prior to this rulemaking, Section 11.28 of the Storage Tank Rule required quarterly periodic inspections of all finished water storage. If a public water system could not perform quarterly periodic inspections of finished water storage, they would have to document an alternative schedule in the finished water storage tank inspection plan. In the subsequent 4 years, the Division has reviewed numerous alternative tank inspection schedules at less frequent than quarterly inspection frequencies. In many parts of the state, due to weather or other reasons, quarterly inspections are not practical and can be a safety hazard to operators. Based on this finding, the Division has determined that assessing a treatment technique violation if a public water system misses a single quarter periodic tank inspection may cause undue burden on the public water system without adding the corresponding public health protection. The Division also agreed with stakeholders that missing a single periodic inspection should result in a storage tank rule violation resulting in a Tier 3 public notice rather than a treatment technique violation provided that a water system never goes beyond a 12 month window without inspecting their storage tanks. However, if a water system goes 12 months without performing a periodic inspection at a storage tank, it is the Division's perspective that public health is unreasonably put at risk and issuing a treatment technique violation is merited. Industry best practice is still to perform periodic inspections quarterly, and the Division asserts that quarterly inspections are the recommended best practice. Once this regulatory update takes effect, the Division will evaluate the regulatory changes going forward to determine that public health continues to be protected. If any unforeseen public health issues arise from these changes to the tank inspection schedules, the Division may recommend that the Commission switch back to a quarterly inspection schedule to better protect public health, as needed.

Therefore, the Commission has amended Section 11.28(2) to require water systems to perform a minimum of two periodic inspections each calendar year and to indicate that inspections may be conducted more frequently than this requirement. A storage tank rule violation will be assessed if a water system fails to perform at least two inspections per calendar year, and a treatment technique violation will be assessed if a water system fails to perform at least one periodic inspection in each 12 month period. The Commission encourages systems to perform periodic inspections quarterly if practicable.

Revisions to Cross-Connection Control Rule (Regulation 11.39)

In 2015, the Commission amended Section 11.39 of the Colorado Primary Drinking Water Regulations' Backflow Prevention Cross-Connection Control Rule to further protect public health and public water systems from potential contamination associated with cross-connections and ensure public water system compliance with Section 25.1.114 & 25.1.114.1 of the Colorado Revised Statutes. The Water Quality Control Division committed during the rulemaking process to continue to engage with stakeholders, solicit input and further evaluate the adopted rule, while providing appropriate protection of the public health and public water systems. In 2018, the Commission amended Section 11.39 in relation to single family homes and duplexes as a direct result of working with suppliers of water on implementing the rules to be equally protective of public health and without being overly burdensome.

The Commission has further revised the Cross-Connection Control Rule to provide additional flexibility to water systems while continuing to protect public health and public water systems from potential contamination associated with cross-connections. The Division recommended that the Commission maintain a stringent requirement for surveying the distribution system to find cross connections, but that requirement not be classified as a treatment technique violation as long as the water system was maintaining a good faith effort to survey their entire system. Also, the ability for the Division to grant alternative schedules for surveying expired on December 31, 2019. The Division and stakeholders agreed that with proper justification, systems should be able to apply and receive alternative schedules as long as those schedules are justified. Also, the Division and stakeholders believed that it would be protective of public health to allow water systems 120 days instead of the previous 60 days to repair failed backflow assemblies and methods. This is primarily a result of many requests from water systems to extend the timeline to install backflow assemblies when installation on the prescribed timeline is not practical. Having the burden to repair a failed assembly be more burdensome than installing a new assembly on a discovered cross connection is not logical. This change makes the regulation more cohesive and still protects public health.

The Division also recommended that the Commission amend the due dates within the rule for achieving 100% survey completion of the drinking water distribution system and for achieving 90% assembly testing. These due dates under the 2015 version of Regulation 11 were both December 31, 2020. The proposal was to keep the 2019 performance metrics for 2020 and extend the requirement to achieve 100% survey compliance and 90% assembly testing requirements out to December 31, 2021. Based on disruptions in the ability to survey properties, enforce backflow assembly testing requirements, and find backflow assembly testers (renewal testing was halted) all resulting from the COVID-19 outbreak in the spring of 2020, the Division recommended this 1 year extension. The Commission believes this extension will adequately protect public health due to the fact that most water systems have made substantial progress both on system surveys and on assembly testing while the extension will simultaneously acknowledge the real challenges that public water systems face during this time of national crisis.

The Commission agrees with the Water Quality Control Division that the survey requirement no longer be classified as a treatment technique violation. When Section 11.39 was amended in 2015 there was a considerable public health threat due to the fact that many water systems had never surveyed any of their systems to find cross connections. However, after four years of implementation, most water systems have surveyed large portions, if not all of their system, and the potential public health threat has been reduced. Since the public health threat has been reduced the Commission agrees with the Water Quality Control Division that it was appropriate to change the classification of the violation. If a water systems efforts to survey their system are deemed to pose a health risk the division can still classify this as a significant deficiency. If a significant deficiency is not resolved within 120 days the Division can issue a violation for failure to resolve the significant deficiency. That violation would require a Tier 2, 30-day public notice therefore in egregious cases the public will be informed in relatively short order if a system is failing to properly correct issues. By removing the survey requirement as a treatment technique violation while still allowing the Division to find a significant deficiency where a water system's failure to survey is creating a public health risk, the revisions give the Division the flexibility to allow water systems that are working hard to meet the survey requirements to continue that work, while also ensuring that public health is protected from systems that do not survey their distribution system for cross connections.

Revisions to Public Notification Rule (Regulation 11.33)

The Public Notification Rule, section 11.33, specifies that for each applicable MCL, MRDL, treatment technique violation, or other situation requiring tier 2 public notification, the supplier must include in the public notice the corresponding health effects language specified in Table 11.33-VI. Such language was inadvertently omitted during the 2015 rulemaking.

The Commission has revised the standard health effects language in Table 11.33-VI for treatment technique violations identified in the Backflow Prevention and Cross-Connection Control Rule, the Storage Tank Rule and the Sanitary Survey Rule.

For a backflow prevention and cross-connection control rule treatment technique violation, the previous language in Table 11.33-VI did not inform the consumer about potential health effects that consumers may experience and did not explain terms that readers may be unfamiliar with, such as “cross connection.” The Commission revised the language in Table 11.33-VI to include this missing information. Also, the Commission removed the examples of sentences that the water system could pick from to describe the violation. The explanations for the violations are not explanations of health effects and the Commission felt that these did not belong in Table 11.33-VI. The water system is still required to include their own, accurate description of the violation, as is required for all public notices, according to the “10 Required Elements” of section 11.33(5) of the Public Notification Rule.

For a storage tank rule treatment technique violation, there was previously no health effects language specified in Table 11.33-VI. Therefore, the Commission added standard health effects language to Table 11.33-VI.

For a failure to correct a significant deficiency treatment technique violation, there was previously no health effects language specified in Table 11.33-VI. Therefore, the Commission added standard health effects language to Table 11.33-VI.

Revisions to the Sanitary Survey Rule (Regulation 11.38)

In the Sanitary Survey Rule, the Commission made a minor edit to avoid water systems receiving multiple, unnecessary violations when violations are discovered on a sanitary survey. Water systems will still be subject to violations during sanitary survey, but with this change they will no longer also violate the sanitary survey rule, which was an unintended consequence and causes undue administrative burden on water systems and the Department without further protecting public health.

11.62 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: October 11, 2022 rulemaking; Final Action November 14, 2022; Effective Date January 14, 2023

The following sections were affected by this rulemaking hearing: Adoption of 11.14 – Direct Potable Reuse Rule with amendments to Sections 11.1, 11.3(32) and (84), 11.24(1), 11.33(7), 11.34(2)(d), and 11.34(2)(e). The provisions of the Colorado Revised Statutes (CRS), sections 25-1-109, 25-1.5 Part 2, 25-1.5-202, 25-8-202, C.R.S. provide specific statutory authority for adoption of these regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4), CRS, the following statement of basis and purpose.

BASIS AND PURPOSE

Background

All suppliers of drinking water in Colorado are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the Safe Drinking Water Act, (42 U.S.C. 300f et seq.) as well as regulations adopted by the Water Quality Control Commission. Colorado, with the Colorado Department of Public Health and Environment (the Department) as the administering agency, has been granted primary enforcement responsibility (primacy) for the public water system supervision program under the federal Safe Drinking Water Act. The Water Quality Control Division (Division) is part of the Department and is responsible for implementing and enforcing the drinking water regulations that are adopted by the Commission and applicable regulations adopted by the Board of Health. In order to maintain primacy from the EPA, states must also promulgate new federal regulations that are no less stringent than those adopted by the federal government. In considering Direct Potable Reuse (DPR) regulations, it is important to recognize that the federal government does not specifically regulate DPR. Rather, the Safe Drinking Water Act regulates groundwater, surface water, and groundwater under the direct influence of surface water as three types of water sources with distinct treatment techniques associated with each source type. Further, the Commission has used its broad statutory authority to require disinfection and treatment of drinking water to adopt the treatment technique of continuous chemical disinfection (usually chlorination). Regarding the practice of Direct Potable Reuse, the EPA has stated in its 2017 Potable Reuse Compendium that while the Safe Drinking Water Act and the Clean Water Act federally present a framework to make water reuse safe, specific regulation for the practice of Direct Potable Reuse will remain at the authority of the individual states. The EPA feels the local needs of each state and water uses should drive the reuse of water and therefore a national regulation may be too prescriptive and not feasible. In this rulemaking the Commission adopted a specific rule for Direct Potable Reuse for Colorado which ensures production of finished drinking water of a quality that is no less stringent than the federally-mandated Safe Drinking Water Act. By retaining primacy, the Department is able to protect the public health by ensuring that public water systems provide safe drinking water to Colorado citizens and visitors.

This rulemaking was comprised of Colorado-specific requirements for suppliers of water seeking to practice Direct Potable Reuse (DPR). The Commission adopted these revisions to address the inevitability of DPR being practiced in Colorado due to growth and limited water supply. In considering whether to explicitly set requirements for DPR, it is important to recognize that, as of this hearing date, Regulation 11 and the Safe Drinking Water Act do not explicitly prohibit DPR. Also, there are several utilities actively planning to begin DPR as soon as the mid-2020s to the extent that the water treatment facilities have already been built to provide the advanced treatment necessary to utilize treated wastewater as their source. Thus, this rulemaking was timely in that it helped to ensure that all suppliers of water planning to practice DPR utilize proper public communication, source water protections, wastewater and drinking water operations and coordination, and execution of all necessary treatment techniques in order to ensure DPR is practiced safely. In order to successfully implement DPR, the supplier will need to demonstrate to the department that it has the technical, managerial, and financial capacity (TMF Capacity) to properly plan for, manage, and operate the following six categories of DPR:

- Communication and Public Outreach Program
- Enhanced Source Water Control Program
- Direct Potable Reuse Operations Program
- Treated Wastewater Control
- Treatment Techniques for Pathogen Reduction
- Treatment Techniques for Chemical Reduction

The Commission recognized that the Division may need additional resources to oversee DPR implementation and expects that the Division would not act on projects that it cannot effectively oversee.

Policies, Handbooks and Guidance and Regulation 11

The Division originally adopted WQCD Policy Number 1, Implementation Policy Framework (Policy 1) in November 2010 and the associated Procedure 1 in August 2012; both were prepared in accordance with the Colorado Administrative Procedures Act, Article 4, Title 24 of the CRS. The Commission adopts regulations that create binding norms or legal obligations of the Department or regulated entities. The Department may develop implementation policies and guidance/handbooks where implementation of Regulation 11 may require interpretation, decision-making flexibility, or a stream-lined approach for meeting compliance requirements. These amendments to Regulation 11 include references to policy documents that the Department developed as part of DPR Stakeholder work and were included as exhibits in the rulemaking.

Policy 1 specifically states that implementation policies and associated procedures are not binding regulations and are not to be applied as such. The referenced policies in these amendments are not independent requirements. Violations or other notices of non-compliance cannot be issued against a policy. Violations or other notices of non-compliance can, and will, only be issued for a failure to comply with Regulation 11 or an applicable statute (law) included in the CRS. Implementation policies have no independent compliance expectation and will continue to be updated in accordance with WQCD Policy Number 1 as implementation of the DPR rule is ongoing.

Communications and Public Outreach Program

The Commission included the requirement that the supplier of water inform and involve the public in the decision to use DPR for a community in a timely manner. Previous DPR efforts in other states have struggled or failed due to the fact that a robust communication and public outreach program was not executed.

Protection of public health when it comes to drinking water requires public confidence in their drinking water system. Thus, various existing requirements in Regulation 11 and federal Safe Drinking Water Act require public water systems to produce and distribute a consumer confidence report and provide other information to the public about their drinking water. Because DPR is a new technology and uses new source water that has distinct public perception issues, requiring enhanced outreach and communication beyond those existing requirements will promote public health.

The Commission determined that suppliers must submit a communications and outreach plan to the division with their application to be approved by the division prior to execution of the plan. The communications and outreach plan will inform the division on how the supplier intends to comply with the requirements in the Communications and Public Outreach Program in 11.14(3). The division has authority to deny projects, and/or require modifications to the plan prior to approving the DPR project.

The Commission recognized the importance of informing the public about the DPR project during early stages of development. Therefore the Commission required that suppliers inform the public of their intention to apply for the DPR project. Then, upon division approval of the communications and outreach plan, there are several distribution mechanisms in which suppliers are required to educate, inform and involve the public about the DPR project [Section 11.14(3)(b)]. These include at least one public meeting, a direct mail or other department approved method, an informative repository with engagement and feedback capability and one other department approved method of informational distribution. The Commission also required minimum educational requirements (e.g. information that suppliers must provide during outreach) [Section 11.14(3)(i)(A-G)]. The Commission required that suppliers provide the education and outreach prior to delivering water to customers to allow for ample time for the public to consider and respond to the DPR project.

The Commission required suppliers to report results of their Communications and Public Outreach Program to hold them accountable for compliance with the requirements [Section 11.14(3)(c)]. The Commission concluded that failure to report the results, and failure to conduct the communications and outreach plan in accordance with this rule would be considered violations of Regulation 11 [Sections 11.14(3)(d-e)].

The Commission required enhanced outreach and opportunities to involve Disproportionately Impacted communities, and requirements to ensure communications from suppliers are provided in other languages spoken by a large proportion of their customers. Due to the highly technical and complex nature of DPR processes, the Commission also required suppliers to disseminate information in a way that is understandable to those without a technical background in the subject matter. The Commission found these enhanced outreach requirements to be equitable, inclusive and appropriate in achieving the goal of meaningful involvement and fair treatment of all customers in a supplier's given service area. Also, the Commission acknowledged that industry best practices recommend assessing community members' opinions about DPR prior to conducting communications and outreach. This can be conducted through surveys, focus groups and other means to collect and assimilate data on attributes of individuals and groups and their perceptions and opinions of DPR. Consequently, this information can be used to target communications and outreach efforts to address concerns and leverage support based on the supplier's local community's perceptions and preferences. In addition, local governments, elected officials, and local public health authorities should be included in communications and outreach. These key community representatives need to be aware of and have an understanding of the DPR project.

Enhanced Source Water Control Program

The Commission included the requirement that the supplier of water develop and implement an Enhanced Source Water Control Program (ESWCP). The ESWCP identifies the responsibilities of the supplier to work with Federal, State, and local government, wastewater utilities, non-domestic wastewater sources, and the public to ensure implementation of source controls to prevent or control constituents of concern including target chemicals which can pass through or interfere with advanced drinking water treatment processes for the production of finished water.

The ESWCP focuses on the wastewater collection and treatment of the raw source water. The DPR rule considers the treated effluent (treated wastewater) from domestic publicly or privately owned treatment works as a source water for suppliers of finished drinking water. Consistent water quality from the source is essential for the supplier to produce finished water. The supplier must be able to ensure that all aspects of the Enhanced Source Water Control Program are implemented in a manner that does not create pass through, interference, or upsets of the advanced drinking water treatment processes and does not inhibit the facility's ability to produce and deliver finished tap water to its customers in accordance with all Regulation 11 requirements.

While the supplier is ultimately responsible for implementing the Enhanced Source Water Control Program, the intent of the regulation is to allow a traditional federal Clean Water Act National Pretreatment Program (as set forth in 40 CFR Part 403), overseen by the wastewater treatment entity, to be a significant or sole component of the Enhanced Source Water Control Program, if deemed sufficient to address constituents of concern including target chemicals for the DPR water treatment facility. When the supplier and wastewater treatment entity are independent operators, the two entities must have a legally binding agreement that establishes specific roles and responsibilities and criteria that must be met to satisfy the supplier's Enhanced Source Water Control Program requirement. For situations where the National Pretreatment Program is not directly applicable, Regulation 11 still requires an Enhanced Source Water Control Program and the pretreatment requirements may be relevant and appropriate components as determined during the risk assessment of the wastewater source(s).

Direct Potable Reuse Operations Program

The Commission included the requirement that the supplier of water develop and implement a Direct Potable Reuse Operations Program. The DPR Operations Program is a critical component of the DPR application process and is the supplier's opportunity to demonstrate to the department that it has the technical, managerial, and financial capacity (TMF Capacity) to properly operate DPR safely and sustainably. While only new community or non-transient,non-community public water systems must submit a TMF review per Regulation 11, 11.4(1)(a), the operations plan is the opportunity for all systems that are proposing DPR to demonstrate that adequate TMF Capacity exists to successfully implement DPR. The elements listed in the regulation for inclusion in the operations plan should be considered by applicants as minimum standards of care and not a comprehensive list for successful implementation of DPR.

The DPR Operations Program is also where the supplier will identify and fully describe the required critical control points used to produce safe drinking water from treated wastewater. Within the DPR rule, the Commission included the term Critical Control Point which is defined as "a treatment process or a portion of a treatment process designed to reduce, prevent, or eliminate a human health hazard." Critical Control Point methodology has been identified as a key component of the DPR framework in establishing the proper number of barriers as well as monitoring and control of those barriers to ensure the production of safe drinking water.

Treated Wastewater Control

The Commission included the requirement that the wastewater treatment plant be identified as a Critical Control Point. Each wastewater treatment plant that provides treated wastewater to a Direct Potable Reuse facility must characterize the treated wastewater for at least one year prior to implementation of DPR. That characterization will then lead to operational limits which will govern whether that source can be sent for further treatment and ultimately to the public. Also, the Commission allowed suppliers of water to further characterize the treated wastewater in order to determine whether lower pathogen reduction goals were appropriate based on a specific treated wastewater quality.

The Commission also required that the supplier of water adequately demonstrate that operations staff at the wastewater treatment facility and the drinking water treatment facility have proper water quality monitoring, communications, and process controls to ensure that the drinking water treatment facility only accepts water that the drinking water treatment facility is capable of treating to drinking water standards.

Treatment Techniques for Pathogen Reduction

The Commission included the requirement that at least three separate critical control points for pathogen reduction be identified. The Commission also included the requirement that the pathogen reductions across all critical control points must achieve specific log reduction based on pathogens: 10-log treatment for Cryptosporidium, 10-log treatment for Giardia lamblia, and 12-log treatment for viruses.

The Commission recognized that the above treatment requirements are derived from a quantitative microbial risk assessment (QMRA). QMRA is a process used to evaluate exposure risks and adverse health outcomes in various applications. The QMRA methodology is complex. However, the Commission acknowledged that the bulk of the analysis has already been completed by the US EPA and others in establishing dose-response relationships for the key pathogens of concern in direct potable reuse. These efforts have established acceptable microbial target concentrations in drinking water that would result in less than 1 in 10,000 illnesses associated with each organism on an annual basis, as shown below:

Giardia = 6.8 x 10^-6 cysts/L (Source: Regli et al, 1991)

Cryptosporidium = 3.0 x 10^-5 oocysts/L (Messner et al, 2001)

Viruses = 2.2 x 10^-7 MPN/L (Source: Regli et al, 1991)

The Commission recognized that the treated wastewater coming from a wastewater treatment plant that produces consistent, "oxidized wastewater" will have pathogen concentrations lower than the above published values based on the bulk of potable reuse research. The term "oxidized wastewater" describes the basic wastewater treatment level beyond simple removal of floating and suspended solids, and is generally described as secondary treatment. Secondary treatment is expected to employ biological methods to reduce chemical and biological loadings to the environment.

This level of treatment has the ability to meet the technology-based limits of Biochemical Oxygen Demand or Carbonaceous Biological Oxygen Demand, Total Suspended Solids, and pH established by the Water Quality Control Commission in Regulation 62, Regulations for Effluent Limitations. The Commission also recognized that certain wastewater treatment facilities will produce pathogen levels that are consistently far lower than referenced above. In such cases, and with the approval of the Division, lower pathogen reduction targets could be established provided that the DPR facility always achieves at least the following levels of treatment: 5.5-log treatment for Cryptosporidium, 6.0-log treatment for *Giardia lamblia*, and 8.0-log treatment for viruses.

The Commission acknowledged that the Division will utilize processes and procedures to approve existing pathogen reduction technologies as part of Regulation 11.8, Surface Water Treatment Rule, and 11.10, Surface Water Treatment Rule: Enhanced Treatment for Cryptosporidium with higher pathogen reduction targets.

Environmental Buffer

The Commission included within the definition of treated wastewater the defined term 'environmental buffer.' It is clear within the definition that any discharge of treated wastewater to a state water will be considered as passing through an environmental buffer. In considering whether a discharge to groundwater has adequate dilution and natural attenuation and thus passes through an environmental buffer, the Commission expects the Division to follow a similar analysis that is utilized for determining whether a source is groundwater under the direct influence of surface water (GWUDI), as defined in Regulation 11 and further expounded upon in Safe Drinking Water Program Policy 3. Since the Division has been evaluating groundwater sources to determine whether they are GWUDI for over 10 years, the Commission agrees that the practices are protective of public health and correctly identify the proper level of treatment for a well source. Consistent with the GWUDI Policy, if the time of travel in the aquifer is greater than 50 days, then the DPR rule would not need to apply to a source. In practice, this would mean the entity would also collect water quality parameters and demonstrate that there are not substantial indicators of potential pathogens (large diameter organisms like diatoms, bacteria, algae, etc) or indicators of wastewater that demonstrate a time of travel less than 50 days. Once a source has been evaluated as described above and the treated wastewater has been confirmed to pass through an environmental buffer, additional pathogen reduction treatment techniques with the DPR rule would not be necessary and would not apply.

Treatment Techniques for Chemical Reduction

The Commission included in the rule a requirement to identify critical control points for chemical reduction. The Commission acknowledged from previous potable reuse work in the United States that a cornerstone of successful DPR both from a public acceptance perspective as well as a reliability perspective is chemical reduction. To confidently provide water that is equally or more safe than existing supplies, suppliers must demonstrate high removal of a wide variety of chemicals, not just known toxins.

The Commission acknowledged that there are thousands of chemical compounds both known and unknown and that monitoring for all of them would be impossible. Therefore, establishing multiple, robust critical control points for chemical reduction will ensure that a wide range of chemicals are reduced to acceptable levels in the finished water.

As stated above, the Commission required one year of treated wastewater characterization for each DPR installation. During this same one year period, the Commission also required that the supplier of water identify target chemicals and indicator compounds present in the treated wastewater. Target chemicals and indicator compounds are defined as follows:

1. **Target Chemicals** are any unregulated chemical causing a potential human health concern that may be present in the treated wastewater. For example: 1,4-dioxane, per and poly fluorinated alkyl substances (PFAS), N-nitrosodimethylamine (NDMA) would be considered target chemicals. Target chemicals must be reduced by one or more chemical critical control points if present in the treated wastewater.

2. **Indicator Compounds.** are chemical indicators chosen to monitor treatment performance in the treated wastewater and finished water.

Target chemicals and indicator compounds will be regularly monitored to verify critical control point integrity. Target chemicals are any unregulated chemical causing a potential human health concern that may be present in the treated wastewater. Some of these chemicals are considered contaminants of emerging concern. For example: 1,4-dioxane, per and poly fluorinated alkyl substances (PFAS), and N-nitrosodimethylamine (NDMA) are considered target chemicals.

Target chemicals must be removed or reduced by one or more chemical critical control points if present in the treated wastewater. The critical control point must consistently and reliably reduce or remove the target chemical to safe levels (e.g. below the threshold for human health concerns). Indicator compounds are chemical indicators chosen to monitor treatment performance in the treated wastewater and finished water.

The Commission established that an advanced oxidation process will be used at all DPR facilities as the primary chemical reduction treatment technique because in all documented DPR scenarios, advanced oxidation is necessary for reduction of target chemicals present in treated wastewater. The supplier of water may then choose additional critical control points for chemical reduction as approved by the Division in accordance with policy.

Additional Amendments

The DPR rule affects several other sections of Regulation 11. The Commission made the following amendments to be consistent with the DPR rule Department practices, to add clarity, or update requirements:

- 11.1 - Addition of statute referencing Disproportionately Impacted (DI) Communities
- 11.3(32) and (84) – Definitions moved from previous locations within a specific rule to the general definitions section as they apply to DPR as well.
- 11.24(1) - Removal of TOC definition from the Disinfection Byproduct Rule specifically
- 11.33(7) – Addition of DPR Treatment Technique and Monitoring and Testing procedure violations to the public notification tables of the Public Notice rule.
- 11.34(2) (d) and (e) – Consumer Confidence Rule content updates to include mandatory public reporting for DPR.

- Typographical errors, renumbering, and updated cross references were revised as necessary throughout Regulation 11.

PARTIES TO THE RULEMAKING

1. Cherokee Metropolitan District
2. Metro Water Recovery
3. South Metro Water Supply Authority
4. Western Resource Advocates and Conservation Colorado

Editor's Notes

History

Entire rule eff. 03/01/2014.

Rules 11.3-11.4, 11.5(3)(a)(iv)(A)(V), 11.5(3)(a)(v)(A), 11.8(1)(b)(iii), 11.8(3)(b), 11.8(3)(c)(i)(B), 11.8(3)(d)(i), 11.8(3)(e)(ii), 11.8(3)(f), 11.11(1)(b), 11.11(2), 11.11(3)(c)-(d), 11.11(4), 11.13(2)(e)(ii), 11.13(4)(a), 11.16, 11.17(1)(a), 11.17(2)(b), 11.17(3)(b)(iv), 11.18(2), 11.19(2), 11.21(2)(a)(ii), 11.21(2)(b), 11.22(2), 11.23(1)(b), 11.23(1)(c)(i), 11.23(2)(b)(ii), 11.25(1)(b), 11.25(2)(b)(ii), 11.25(3)(b)(ii), 11.26(4)(I)(i)(D), 11.28, 11.33(2)(a), 11.33(3)(b)(ii)(A)(II), 11.33(4)(a), 11.33-V-VI, 11.34(2)(a)(iii)(F)-(G), 11.34(2)(d)(iii)(C), 11.34(2)(d)(iii)(G)-(H), 11.34(2)(e)(xii)-(xviii), 11.34(3)(c)(ii), 11.34-I, 11.36(4), 11.37(1)(a), 11.39, 11.41, 11.43(2)(c)(ii), 11.43(4)(c)(ii), 11.45(1), 11.46, 11.47(1), 11.57 eff. 04/30/2015.

Rules 11.2(6), 11.3, 11.5, 11.8, 11.11(1)-(4), 11.13, 11.16, 11.17, 11.18(2), 11.19(2), 11.21(2), 11.22(2), 11.23, 11.25(1)(b), 11.25(2)(b), 11.25(3)(b), 11.28(1)(a), 11.33(2)-(4), 11.33(7) Tables 11.33-V, VI, 11.34(2)(d)-(e), 11.34(4) Table 11.34-I, 11.36(4)(c)-(d), 11.37, 11.39(1), 11.43(2)-(3), 11.45(1) Table 11.45-I, 11.46(2)-(14), 11.47(1), 11.58 eff. 06/30/2018.

Rules 11.2(6), 11.59 eff. 12/30/2018.

Rules 11.3(41)(68)(78), 11.8(3), 11.11(4), 11.16(1), 11.16(3)-11.16(9), 11.16(11), 11.16(12), 11.23(1), 11.33(4), 11.33(7), 11.34(2), 11.34(4), 11.43(2)-11.43(4), 11.45(1), 11.60 eff. 04/30/2020.

Rules 11.28(2)(a)(iii), 11.28(3)-(4), 11.33(7) Table 11.33-VI, 11.38(3), 11.38(4)(a), 11.39(2)(c), 11.39(3)(c)-(d), 11.39(6)(a)-(b), 11.61 eff. 09/30/2020.

Rules 11.3(32),(84), 11.14, Table 11.33-V, Table 11.33-VI, 11.34(2)(d)(i)(C), 11.34(2)(e)(xviii), 11.62 eff. 01/14/2023. Rule 11.24(1)(g) repealed eff. 01/14/2023.