
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.

11.3 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).

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- (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.

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- (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., chlorine, 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 (\leq) 0.2 percent lead when used with respect to solders and flux.
 - (b) A weighted average of less than or equal to (\leq) 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.

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- (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)~~~~(84)~~“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)~~~~(85)~~“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)~~~~(86)~~“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)~~~~(87)~~“VIOLATION” means failure to comply with any requirement of the Colorado Primary Drinking Water Regulations.

~~(89)~~~~(88)~~“VIRUS” means a virus of fecal origin, which is infectious to humans by waterborne transmission.

~~(90)~~~~(89)~~“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)~~ ~~(90)~~—“WATERWORKS” means the facilities that are directly involved in the production, treatment, or distribution of water for public water systems.

~~(92)~~ ~~(91)~~—“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)~~~~(92)~~“WATER VENDING AND DISPENSING MACHINES” means any device which, upon payment dispenses water into a container.

~~(94)~~ ~~(93)~~—“WHOLESALE” means any person who owns or operates and is legally responsible for a wholesale system.

~~(95)~~~~(94)~~“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

<u>Term:</u>	<u>Means:</u>
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	<i>Colorado Primary Drinking Water Regulations</i>
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-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

11.14 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 25th and 75th 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.

11.24 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.

~~(g) "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.****~~

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 NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
<u>Violations of Colorado Primary Drinking Water Regulations²</u>				
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)
<i>E. coli</i> (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)
<i>E. coli</i> (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)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
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 <i>Cryptosporidium</i> 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)
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)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
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 NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
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)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
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)
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)

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

Contaminant	MCL/MRDL/TT violations		Monitoring & testing procedure violations	
	Tier of public notice required	Citation	Tier of public notice required	Citation
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 NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
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 Monitoring⁸				
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

TABLE 11.33-V TABLE OF CPDWR VIOLATIONS AND OTHER SITUATIONS REQUIRING PUBLIC NOTICE¹

<u>Contaminant</u>	<u>MCL/MRDL/TT violations</u>		<u>Monitoring & testing procedure violations</u>	
	<u>Tier of public notice required</u>	<u>Citation</u>	<u>Tier of public notice required</u>	<u>Citation</u>
Source Water Sample Positive for GWR Fecal indicators: <i>E. coli</i> , 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)
<u>Direct Potable Reuse Rule violations</u>	<u>1, 2</u>	<u>11.14</u>	<u>3</u>	<u>11.14</u>
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

<u>Contaminant</u>	<u>MCLG</u> mg/L	<u>MCL</u> mg/L	<u>Standard health effects language for public notification</u>
<i>Colorado Primary Drinking Water Regulations</i>			
Microbiological Contaminants			
Fecal Indicators (GWR) 1. <i>E. coli</i> 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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
A violation that occurred for failure to conduct an assessment not triggered by the presence of <i>E. coli</i> and/or violations for corrective action		TT	<p>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.</p> <p>[THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.]</p> <p>We failed to conduct the required assessment.</p> <p>We failed to correct all identified sanitary defects that were found during the assessment(s).</p>
A violation that occurred for failure to conduct an assessment triggered by the presence of <i>E. coli</i> and/or violations for corrective action ³		TT	<p><i>E. coli</i> 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 <i>E. coli</i>, 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.</p> <p>[THE SUPPLIER MUST ALSO INCLUDE THE FOLLOWING APPLICABLE SENTENCES.]</p> <p>We failed to conduct the required assessment.</p> <p>We failed to correct all identified sanitary defects that were found during the assessment that we conducted.</p>

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
<i>E. coli</i> MCL violations	Zero	See footnote 2	<i>E. coli</i> 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			

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
<i>Giardia lamblia</i>	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			
<i>Legionella</i>			
<i>Cryptosporidium</i>			
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.
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	3×10^{-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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.
Hexachlorocyclopentadiene	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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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.
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> <u>mg/L</u>	<u>MCL</u> <u>mg/L</u>	<u>Standard health effects language for public notification</u>
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			

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
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.
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.

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<u>Contaminant</u>	<u>MCLG</u> mg/L	<u>MCL</u> mg/L	<u>Standard health effects language for public notification</u>
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.
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.

TABLE 11.33-VI TABLE OF STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

<u>Contaminant</u>	<u>MCLG</u> mg/L	<u>MCL</u> mg/L	<u>Standard health effects language for public notification</u>
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.

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
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.
Direct Potable Reuse Rule			
<u>Critical control point for pathogen reduction of <i>Cryptosporidium</i>, <i>Giardia lamblia</i>, and/or viruses</u>	None	TT	<u>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</u>
<u>Critical control point for chemical reduction</u>	None	TT	<u>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 <i>Direct Potable Reuse Policy</i> 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.</u>

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(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.

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- (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.

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- (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.

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- (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 11.34-1 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:

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- (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.

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- (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 (\leq) 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:

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- (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.
- (xviii) The supplier may include additional information necessary for public education consistent with, and not detracting from, the purpose of the CCR.

11.62 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE: October 11, 2022 rulemaking; Final Action November 14, 2022; Effective Date <INSERT DATE>

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