
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