# Colorado Operator Certification Program 2022 Annual Report to US Environmental Protection Agency

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For questions or additional information, please contact:

Jessica Morgan Water Quality Control Division 4300 Cherry Creek Drive South Denver, Colorado 80246-1530 720-239-2320 jessica.l.morgan@state.co.us

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#### Introduction

In 1999, the U.S. Environmental Protection Agency (EPA) issued its *Final Guidelines for the Certification and Recertification of the Operators of Community and Non-Transient Non-Community Public Water Systems*, 64, CFR 5916 (guidelines) specifying minimum standards for certification and recertification for the operators of community and non-transient non-community public water systems. The goal of the operator certification program is to protect human health by ensuring that skilled professionals are overseeing the treatment and distribution of safe drinking water. Operator certification is a crucial step in promoting compliance with the Safe Drinking Water Act (SDWA), and oversight of the program ensures that these steps are taken. On June 22, 2001, EPA approved the State of Colorado's Operator Certification Program (program) as being consistent with the guidelines.

This is Colorado's annual program report to the EPA for the calendar year 2022. In accordance with the guidelines, this report addresses the status and continued implementation of Colorado's program for the nine Baseline Standards for both community and non-transient non-community water systems. The nine program components are:

- 1. Authorization
- 2. Classification of systems, facilities, and operators
- 3. Operator qualifications
- 4. Enforcement
- 5. Certification renewal
- 6. Resources needed to implement the program
- 7. Recertification
- 8. Stakeholder involvement
- 9. Program review

#### 1. Authorization

The Water and Wastewater Facility Operators Certification Board (board) is a section of the Division of Administration within the Colorado Department of Public Health and Environment. Article 9 of Title 25, Colorado Revised Statutes (C.R.S.), requires every water and wastewater facility to be under the supervision of a certified operator holding a certificate equal to or greater than the classification of the facility. The board is authorized by 25-9-101 et. seq., C.R.S., to promulgate *Water and Wastewater Facility Operators Certification Requirements*, Regulation 100, 5 CCR 1003-2, (Regulation 100). The current version of Regulation 100 maintains the same level of rigor for the certification of operators and regulation of facilities as the 1997 version, which was the version in effect when the EPA published its guidelines document in 1999. The board continues its commitment to the protection of public health and the environment with the current version of Regulation 100. No regulatory "backsliding" has occurred in comparison with the 1997 version of Regulation 100.

The Colorado Department of Public Health and Environment, Water Quality Control Division (division) has been delegated responsibility for the oversight of public water systems in Colorado to ensure compliance with and enforcement of the provisions of Regulation 100, the Safe Drinking Water Act, the Colorado Primary Drinking Water Regulations (Water Quality Control Commission Regulation 11), and other pertinent regulations.

#### 2. Classification of Systems, Facilities, and Operators

#### Public Water Systems

The division is responsible for applying board direction to classify all public water system treatment and distribution system facilities in accordance with the provisions of Regulation 100. Treatment classification is based on specific design features that include treatment processes and their complexity, source water type, and design capacity. Distribution systems are classified by the population served, with additional consideration given to systems with certain complexities. Water treatment facilities are classified as Class D, Class C, Class B, or Class A. Class A is the highest level of classification. Water distribution systems are classified as Class 1, Class 2, Class 3, or Class 4. Class 4 is the highest level of classification. Table 1 reports the number of facilities by classification.

Water Treatment Facilities					
	Class D	Class C	Class B	Class A	
Community	334	195	97	108	
Non-Transient Non-Community	105	47	7	3	
Total	439	242	104	111	
Distribution Systems					
Class 1 Class 2 Class 3 Class 4					
Community	680	169	75	12	
Non-Transient Non-Community	117	9	0	0	
Total	797	178	75	12	

#### Table 1 - Facilities by Classification

#### **Certified Operators**

Regulation 100 requires every water and wastewater facility to be operated under the supervision of a certified operator in responsible charge who holds a certificate equal to or greater than the classification of the facility. Colorado does not have a temporary operator certification program. All facilities are required to comply with the operator in responsible charge requirement all the time. Regulation 100 also reserves all process control and system integrity decisions to the certified operator in responsible charge or another operator holding a certificate equal to or greater than the classification of the facility in accordance with a written operating plan. The certified operator in responsible charge or another operator who holds a certificate equal to or greater than the classification of the facility must be available at all times during operating hours of a water treatment or distribution facility.

Colorado uses the Safe Drinking Water Information System to track system names, identifications, and classifications for each public water system. It also tracks the names and certification levels for the operator in responsible charge for each public water system.

Compliance with operator certification requirements is a Colorado Safe Drinking Water Program priority. Table 2 represents the systems in compliance with the certified operator requirements as of December 31, 2022. The EPA considers the operator violation a systemlevel violation, meaning that failure to have both a treatment and a distribution operator, when both are required, receives only a single violation. Therefore, Table 2 reports compliance rates based on 945 community systems. For additional clarity, the table shows that the 945 community systems require a total of 1,668 operator certificates. The table analogously reports the numbers for non-transient non-community and transient non-community systems.

	Operator	Number of	In	Compliance
	certificates	systems	compliance	rate
	required			
Community treatment	732	945	922	<b>98</b> %
Community distribution	936			
Non-Transient Non-Community treatment	162	173	172	<b>99</b> %
Non-Transient Non-Community distribution	126			
Transient Non-Community treatment	936	959	931	<b>97</b> %
Transient Non-Community distribution	597			

#### Table 2 - System Compliance Rates

Non-compliance is a result of one of the following circumstances:

- 1. A certified operator has not been designated by the system's owner.
- 2. The operator's certificate has expired.
- 3. The operator's certificate is not at the correct level for the facility they are operating.

During the calendar year 2022, the number of systems without a certified operator for any of the reasons listed above was 52.

#### 3. Operator Qualifications

#### **Active Operators**

Colorado requires that operators pass an exam appropriate to the classification for which they are applying. The state requires separate treatment and distribution certificates, and for operators to take exams sequentially. Sequential testing requires the applicant to hold a valid certificate at the level immediately below the level of the exam they apply to take.

Active drinking water certificate counts as of December 31, 2022 are listed by category and class in Table 3. Note that Colorado issues a Class S certificate that combines treatment Class D and distribution Class 1 operator certificates. Class S certificates are designed specifically for public water systems serving populations of less than 3,300 with basic treatment processes. We view this as a benefit to small systems. Many operators hold multiple certificates.

Certificate levels*	Active Certificates		
Treatment class A	849		
Treatment class B	456		
Treatment class C	653		
Treatment class D	941		
Class S	431		
Total treatment	3,356		

Distribution class 4	825
Distribution class 3	530
Distribution class 2	883
Distribution class 1	1,335
Total distribution	3,573

\* Class A is the highest level of treatment classification. Class 4 is the highest level of distribution system classification.

#### Exam Pass Rates

Successfully passing exams is vital to maintaining a steady workforce of certified operators.

Colorado administers the Association of Boards of Certification (ABC) internationally standardized and validated exams. ABC exams are rigorously developed using in-depth job analyses, the development of Need-to-Know Criteria for each category and level of exam, the use of subject matter experts to write exam items, and a psychometric analysis of each item to ensure the exams test whether the operator has the necessary skills, knowledge, ability, and judgment as appropriate for the certificate level. Colorado requires operators to take exams sequentially. Sequential testing requires the applicant to hold a valid certificate at the level immediately below the level of the exam they apply to take.

In 2022, 1,778 water treatment and distribution exams were administered. This is essentially equivalent to the 1,783 exams administered in 2021.

The 2022 average pass rate for water treatment exams remained the same at 64 percent. The average pass rate for distribution exams decreased from 58 to 55 percent. The overall pass rate for water treatment and distribution decreased from 61 to 59 percent.

In 2022, all Colorado exams were administered electronically. Most exams were administered at a proctored test center, however, Colorado also administers remotely proctored examinations, meaning candidates could test at their homes or workplaces under carefully monitored conditions. Tables 4 and 5 below show the pass rates for first-timers (candidates who passed the first time they took the exam) and the pass rates for repeaters (candidates who previously failed the exam). The number of first-time exams is a separate count from the number of repeater exams. Together, they account for 1,768 of the exams administered in 2022. Ten "re-credentialing" exams are not included in either count. These are candidates whose certifications expired and were not restored within two years. These candidates were required to sit for exams to become certified again. They aren't taking exams for the first time ever, but they also aren't operators taking a repeat exam because of a first-time failure.

Level	Number of exams	Number passed	Pass rate
WT - A	81	39	48%
WT - B	98	77	<b>79</b> %
WT - C	127	96	76%
WT - D	198	158	80%
Class S	42	36	86%
Total	546	406	74%
D - 4	86	39	45%

 Table 4 - First Timer Exam Pass Rates

D - 3	113	78	<b>69</b> %
D - 2	171	107	63%
D - 1	293	198	68%
Total	663	422	64%

#### Table 5 - Repeater Exam Pass Rates

Level	Number of exams	Number passed	Pass rate
WT - A	85	22	26%
WT - B	30	13	43%
WT - C	35	16	46%
WT - D	60	29	48%
Class S	7	3	43%
Total	217	83	38%
D - 4	57	21	37%
D - 3	56	24	43%
D - 2	103	34	33%
D - 1	126	51	41%
Total	342	130	38%

Data in the tables above suggest that repeating the exam helped a significant number of candidates, although less than half, pass the second time.

Prior to 2019, the program compared pass rates of written exams to those of electronic exams. Candidates who took the electronic versions fared better than those who took paper tests. When Colorado began to administer all exams electronically in 2019, the program started to compare the pass rates of first-time test takers against the pass rates of repeaters. Table 6 shows the comparative pass rates as well as the average pass rate for all exams over the past five years.

The administration of all electronic exams appears to be a key factor in raising the average exam pass rate in 2019 and subsequent years over the years when paper exams were an option.

	Written	Electronic	Average
2018	51%	61%	57%
2010	51/0	01/0	5170

#### Table 6 - 5-Year Exam Pass Rates

	First Time Average	Repeater Average	Total Average
2019	68%	43%	65%
2020	70%	37%	61%
2021	68%	43%	61%
2022	69%	38%	59%

#### Education and Experience Requirements

Regulation 100 requires all operators to be high school graduates, hold a general equivalency diploma (GED), or meet additional experience and board approved training requirements to qualify to sit for an examination. Regulation 100 defines the minimum amount of in-facility experience required to sit for each exam level. Up to 50 percent of the required job experience may be met with post high school education or with cross-experience. The cross experience is between water and wastewater treatment or distribution and collection.

#### **Operator Certification-Capacity Development Partnership**

The Local Assistance Unit within the Community Development and Partnership Section in the Colorado Safe Drinking Water Program works in partnership with drinking water systems, assistance partners, and division staff from various program areas to provide training, assistance, and management support services to public water systems. The assistance partnership reaches operators and system owners on a grassroots level to improve compliance, enhance water quality, better position a system managerially, financially, and technically for the future, and to protect public health. The Local Assistance Unit also directly provides technical, management, and financial assistance one-on-one and through group training to public water systems so they can strengthen their ability to supply safe drinking water to the public.

The operator certification staff person, within the Local Assistance Unit, serves as the liaison to the Water and Wastewater Facility Operators Certification Board (board) and provides outreach and compliance assistance to operators and system owners. This ensures alignment with capacity development efforts including training, certification challenges, and improved assistance to facility owners.

The division provides outreach to operators in an effort to address the identified areas of concern:

- The division sponsors no or low-cost training offered at multiple locations across the state with a focus on operations and regulations.
- In 2022, division coaching staff provided 94 on-site, individual operator training sessions, webinars, and in-person classroom-style training all at no cost to attend.

The 2022 annual running monthly average is 79% of all systems that received one-onone assistance from a Local Assistance Unit coach are making at least one improvement. The improvement percentage is based on the success of coaching visits as measured by the number of systems improving performance as a result of coaching assistance across the following 10 different areas: Source water adequacy and protection, Treatment operations and maintenance, Residuals management, Storage tank operations and maintenance, Distribution system operations and maintenance, Water quality monitoring and sampling, Cross-connection control, Emergency preparedness and response, Financial viability, and Managerial capacity. Specific examples of improvements in these categories made at systems as a result of assistance include:

• Source water adequacy and protection by:

- Exploring previously dug wells for source water redundancy
- GWUDI monitoring from April October
- Treatment operations and maintenance by:
  - Exploration of interim solutions to protect public health for those customers that are unable to receive water from a nearby community water system
  - Completing disinfection outreach and verification effort (DOVE)
  - Emergency treatment installed
  - Seasonal start-up completed
  - Owner becoming certified
  - Reading and recording Entry Point (EP) and turbidity at the correct locations
- Disinfectant residuals management by:
  - $\circ$  Sampling with the EPA approved protocol for chlorine residual
- Storage tank operations and maintenance by:
  - Nothing new to report for 2022
- Distribution systems operations by:
  - Working with Water Quality Control Division (WQCD) staff to reclassify the distribution system operator certification level for systems if they are based on having only one distribution zone
  - New Total Coliform Rule (TCR) sampling locations
  - $_{\odot}$  Disinfected Distribution System (D.S.), collected Special Purpose samples for Boil Order
- Water quality monitoring and sampling by:
  - $_{\odot}$  Implementing Disinfection Byproduct (DBP) testing (not required) and investing in the creation of sample stations
  - Complete and submit materials evaluation form and submit adequate Lead and Copper Rule (LCR) sample sites through the drinking water portal
  - Being able to calculate Locational Running Annual Average (LRAA)
- Cross connection control by:
  - Creating and implementing a Backflow Prevention and Cross-Connection Control (BPCCC) program
  - Surveying Revised Total Coliform Rule (RTCR) sample locations that are homes for cross-connections
  - New BPCCC plan
  - Completed an annual report
  - Ensure supplier is tracking interconnect backflow device
  - Emergency preparedness and response by:
    - Connecting with critical customers
    - Connecting with county partners
    - Building an emergency drinking water supply plan
- Financial viability by:
  - Raising rates to adequately cover project costs and current Operator in Responsible Charge (ORC) costs
- Managerial capacity by:

- Creating a yearly compliance schedule, creating maintenance logs, and certifying caretaker as a drinking water operator
- Establishing written definition of roles for the board and the ORC, establishing compliance schedules by using division tools, setting up a drinking water portal account for the board, and revising the monitoring plan with current information
- Continuing Total Organic Carbon (TOC) and DBP testing throughout the system and/or decommissioning the system and truck in water
- Sending a letter to the WQCD about the need for system funds, construction forms, monthly United States Department of Agriculture (USDA) meetings, and virtual meetings with the WQCD Compliance Assurance Section (CAS)
- Creating leadership roles and identifying back-ups for drinking water advisory situations
- Creating communications plans, including Public Notices (PNs)
- Increasing regulatory understanding of the Administrative Contact (AC)
- Developing an ORC Delegation Plan
- Completing and submitting the monitoring plan
- Delegation Plan, completed boil order PN
- The Local Assistance Unit provides support for Colorado's Water and Wastewater Agency Response Network (CoWARN) and works with them to provide systems and operators with emergency preparedness and response training. In 2021, the Local Assistance Unit entered into a contract to develop a new and improved CoWARN website. In 2022, the contract was still ongoing. The launch of the new CoWARN website is anticipated in CY 2023.

#### **Grand-Parenting**

Colorado's grand-parenting provision is found in Regulation 100.18. It allowed water distribution operators who were certified before January 30, 2001, under the voluntary program to become certified under the mandatory program without testing as long as:

- they met all other certification requirements,
- they continued operating the specific system in which they were employed on January 30, 2001, and
- the facility classification remained the same.

The restricted certificate is renewable in accordance with applicable rules regarding training units. On December 31, 2022, there were 26 operators still holding active restricted distribution certificates. Seventeen other operators held expired restricted distribution certificates that were within the 2-year restoration period. All others granted a restricted certificate has either allowed the certificate to expire or have successfully passed a certification exam and no longer rely on a restricted certificate.

#### 4. Enforcement

#### Facility Enforcement

Enforcement authority under 25-9-110(3), C.R.S. is granted to the department to issue and enforce administrative orders and to impose civil penalties against facility owners for failure to operate their systems under the supervision of a certified operator. In 2022, the division issued Tier 2 health-based violations to owners of 37 public water systems for failure to have a certified operator or failure to have a certified operator at the correct level for the facility they were operating. These violations included both system owners who were contacted for failure to designate an operator in responsible charge and system owners who received notifications because the operator in responsible charge did not hold a valid certificate at a sufficient level for the system. Colorado considers both of these situations as insufficient operator certification for the facility. Colorado enforces the requirement to provide public notice within 30 days of the violation notice, which is a powerful motive for compliance. Of the 37 violations issued in 2022, 26 of those had returned to compliance by December 31, 2022. Owners that do not return to compliance in a timely manner may be issued a formal enforcement order with penalties. During 2022, the division issued three formal enforcement actions with penalties against facility owners for violating the certified operator requirements. Of the three enforcement actions issued in 2022, zero had returned to compliance by December 31, 2022.

#### Operator Disciplinary Action

The board has authority under 25-9-104(6), C.R.S. to establish criteria for the discipline or reprimand of an operator. Section 100.23.3 grants the division authority to investigate instances of possible misconduct by certified operators. In 2022, the division initiated seven investigations of operator misconduct and concluded an eighth investigation initiated in 2021. In three cases, informal letters of reprimand from the division were sent to the operators. One investigation was closed without findings as the board's options for disciplinary action were limited due to that individual voluntarily surrendering his two operator certificates. Four investigations were still ongoing at the end of 2022.

#### 5. Certificate Renewal

#### **Certificate Renewal and Professional Development**

Regulation 100 requires ongoing professional development to renew certificates every three years. As an incentive to maintain certificates in current status, a late fee of \$50 is charged to an operator who submits the renewal application after the certificate's expiration date (restored certificates). Training courses used to fulfill the professional development requirement must be approved by the board or its contractor. Operators who fail to renew or qualify for renewal within two years of the expiration of their certificate must complete the recertification process.

Treatment A	215
Treatment B	60
Treatment C	40

#### Table 7 - 2022 Certificate Renewals

Treatment D	91	
Treatment S	49	
Distribution 4	224	
Distribution 3	44	
Distribution 2	86	
Distribution 1	117	
Total	956	

#### Table 8 - 2022 Restored Certificates

Treatment A	31	
Treatment B	13	
Treatment C	19	
Treatment D	26	
Treatment S	29	
Distribution 4	29	
Distribution 3	20	
Distribution 2	41	
Distribution 1	54	
Total	262	

Individual operators are responsible for tracking and reporting training units for certification renewal. They are supported in this effort by tools built into the operator portal. In most cases, course providers upload attendance sheets for pre-approved training events into the database. Training units issued in this way can be tracked by operators in their individual accounts. When operators take courses that have not been pre-approved for training units, they must upload certificates of completion and information about the course into the operator portal for review before training units can be issued. All training unit data is reviewed to determine fulfillment of the professional development requirements. In 2022, over 1,300 courses approved for limited "in-house" presentations, as well as courses available to all operators. Many of these classes were held multiple times within the year. The price for each course varies from no charge to several hundred dollars for multiple-day training events.

Colorado does not maintain a clearinghouse that tracks the number of classes taught by an instructor or institution, the number of attendees at each training class, or the cost to the student for each course. Courses approved for training units are not ranked by certification level.

Trainers submit applications for training units which are reviewed by the board's contractor. The board's contractor assigns the number of possible training units to each approved course. Approved courses are entered into a searchable course catalog. Operators and other interested persons can search for approved training online at:

https://portal.coloradocwp.com/External/Pages/CourseCatalog/Operator/CourseCatalogSea rch.aspx.

#### 6. Resources Needed to Implement the Program

During 2022, Colorado contracted with the Colorado Rural Water Association, which operated the Colorado Certified Water Professionals (CCWP) Office to oversee the daily operation of the operator certification portion of the program.

Colorado also contracted with the Association of Boards of Certification for testing services and test administration.

Income to support the CCWP Office, as well as to pay for tests and test administration, originates from fees charged to applicants and operators as authorized by statute and Regulation 100.

Operator certification fees do not fund agency staff. All agency staff funding is provided through state general funds, general program fees, and various federal grants. The division has one full-time employee dedicated to operator certification who serves as staff to the board and as the division liaison to the board. In addition, compliance with the requirements of Regulation 100 is performed by the drinking water compliance and enforcement staff, and compliance is checked on-site by field services section staff during sanitary surveys. Facility classification is assigned at the time of design review by engineering section staff. The division's data system, management, and administrative teams provide the necessary support for the program as well. The board's administrator represents approximately 0.6 full-time employee. In total there are nearly 100 division staff members with responsibilities related to the certified operator program. Under the current organization, Colorado has sufficient resources to implement its operator certification program now and into the future.

#### 7. Recertification

Certificates are valid for three years from the date of issue. If an operator's certificate expires, the individual is not certified and can no longer claim to be a certified operator. A certificate may be restored, through renewal, for up to two years after the expiration date, with payment of a \$50 late fee. However, a certificate will be revoked automatically after two years if it is not renewed. Subsequently, an individual who desires to be re-certified must apply as a new applicant for certification and sequentially re-test.

#### 8. Stakeholder Involvement

#### Rulemaking

No amendments were made to Regulation 100 in 2022. The current version of Regulation 100 is included as Appendix A of this report.

#### **Board Meetings**

The board held seven meetings in 2022; all meetings are open to the public and participation is encouraged. An opportunity is provided for public comment at the beginning of every meeting. All board meetings were held virtually due to COVID-19. The virtual meetings have improved stakeholder participation.

#### Aqua Talk Newsletter

The Safe Drinking Water Program publishes a weekly blog that is publicly available to all system owners, operators, and others. At least one article is posted to the blog every two weeks and at least one article specifically focusing on operator certification topics of interest and any changes to regulation or board policy is published every quarter. Electronic copies of historic Aqua Talk newsletters and the link to subscribe to the drinking water program email list can be found using this link to the blog:

https://aquatalk-colorado.blogspot.com/.

#### 9. Program Review

The division conducts periodic reviews of its processes, procedures, and data management. Additionally, regulations, training needs, and exam items are reviewed with the stakeholders regularly. Each public water system is assigned to one compliance specialist. The compliance specialist oversees all compliance and enforcement activities related to a specific water system in regard to both drinking water regulations and operator certification regulations. This is a holistic approach that enhances communication between the division and the regulated community and has improved program efficiency and effectiveness.

In 2019, the program reached out to the state of Wyoming for an external program review. Feedback from Wyoming regarding Colorado's compliance with the nine baseline standards has not yet been completed.

The division continues to work toward developing a standardized approach to conducting both internal and external reviews.

#### Conclusion/Summary

Colorado's facility operator certification program is meeting the requirements for the nine Baseline Standards for community and non-transient non-community water systems in accordance with the guidelines.

## Appendix A

### Water and Wastewater Facility Operators Certification Requirements, Regulation 100

### 5 CCR 1003-2

Amended September 28, 2021

Effective November 30, 2020

# Appendix B

### Attorney General's Certificate of Enforceability