



Drinking Water Capacity Development Program Report to the Governor

Submitted to Governor Jared Polis



2025



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Executive summary

Over 2,000 active public drinking water systems exist in Colorado. Drinking water systems range in size from small restaurants or communities that serve 25 people to a service area the size of the City of Denver. Drinking water sources include groundwater wells, surface water such as rivers, lakes, and reservoirs, or a combination of both. A public water system's treatment spans from a simple well and chlorinator to a complex treatment system that can cost millions of dollars to construct. The complexity of meeting drinking water standards can sometimes make compliance with regulatory requirements difficult to achieve for public water systems. These challenges are even greater for public water systems in underserved communities with equity and justice challenges.

The 1996 Safe Drinking Water Act (Act) amendments added Drinking Water State Revolving Fund grant requirements. The amended act required each state to create a capacity development program to assist public water systems in developing technical, managerial, and financial capabilities to strengthen their ability to supply safe drinking water to the public. Additionally, the amendments to the Safe Drinking Water Act, as mandated by the American Water Infrastructure Act (AWIA) of 2018, require states to revise their capacity development program to include descriptions of how the state will encourage development and implementation of asset management plans by public water systems.

States that fail to implement a capacity development program and submit a report on the program's effectiveness to the governor every three years are at risk of losing 20 percent of the annual federal Drinking Water State Revolving Fund capitalization grant. The Drinking Water State Revolving Fund program typically receives tens of millions of dollars annually. Colorado would risk losing millions of dollars annually if the state does not meet these requirements. This report meets these federal requirements.

The Safe Drinking Water Program in the Water Quality Control Division of the Colorado Department of Public Health and Environment fully implements a capacity development program aligned with the requirements of the Act. As the 1996 and 2018 amendments require, the Safe Drinking Water Program developed a capacity development strategy.

Associated work plans focused on the goals of the capacity development strategy are developed on a five-year rotating schedule to keep consistency in year-to-year efforts and provide an opportunity to revise and update work plans. EPA has approved Colorado's strategy. Colorado's work plans have been recently revised and are pending EPA approval.

The strategy and work plans focus on three key areas: new public water systems, existing public water systems, and program administration. For new drinking water systems, the program focuses on a review of the technical, managerial, and financial capacity of the proposed system to ensure the system created will consistently provide safe drinking water. For new and existing systems, the program has delivered a wide variety of training and assistance efforts directed toward helping systems achieve technical, managerial, and financial success. These efforts have helped drinking water systems comply with their regulatory obligations.

Systems receive inspection preparation training and routinely indicate that the training was beneficial and well received. Thanks to these efforts, inspectors often report no violations or deficiencies at systems that have received these training sessions.

Colorado received the full amount of water infrastructure funding from the U.S. Environmental Protection Agency in fiscal year 2023. This amount is significantly more than the grants received in FYs 2021 and 2022 because the state's capacity development program aligns with the Safe Drinking Water Act requirements. The Bipartisan Infrastructure Law (BIL) made additional funding possible as enacted in the Infrastructure Investment and Jobs Act of 2021.

Colorado typically exceeds the regional goal that 90 percent of the population served by community water systems receives water that meets all health-based standards. Over the last five years, Colorado's average for this metric ranges between 96 and 98 percent. However, many small rural water systems face ongoing struggles with several issues, such as high levels of naturally occurring radionuclides like uranium and radium in their source water, increasing complexity of drinking water regulations and treatment technology, and an aging workforce. Many small water systems in underserved communities, with equity and justice challenges, often have difficulty adequately responding to these issues. These struggles were compounded by the challenge of the COVID-19 pandemic. Additionally, Coloradans continue to struggle with the impact of lead and with unregulated contaminants in drinking water, such as per- and polyfluoroalkyl substances. However, the state has implemented sampling and assistance programs to help mitigate these struggles.

As a result, there is continued increased demand for workforce development and an increased need for high-quality and affordable training for drinking water operators to better manage these issues.

The Safe Drinking Water Program anticipates the continued use of Drinking Water State Revolving Fund capitalization grant funds to fully implement Colorado's capacity development program and to help public water systems achieve and maintain technical, managerial, and financial capacity. We responsibly steward these financial resources and use data to direct decisions on work plan priorities.

1.0 Introduction

This report, written for the Governor of the State of Colorado, provides an overview of the capacity development program as required by the Safe Drinking Water Act. The report also provides an excellent basis for anyone to understand the structure and effectiveness of the safe drinking water capacity development program in Colorado.

Capacity development is often misinterpreted as “building infrastructure.” The capacity development program is designed to enhance a water system’s ability to manage and operate its existing infrastructure effectively and identify when infrastructure changes are essential. The three components of capacity development are:

1. Technical: Physical infrastructure, and operational ability.
2. Managerial: Personnel expertise, institutional and administrative capabilities, including asset management.
3. Financial: Monetary resources.

This report includes:

- Section 2.0: An overview of the Safe Drinking Water Act with a description of required and voluntary state activities under the act and an in-depth description of the capacity development strategy and incorporation of asset management
- Section 3.0: A description of activities during fiscal years 2021 through 2023.
- Section 4.0: A discussion of the efficacy of the strategy.
- Section 5.0: How this report is made available to the public
- Section 6.0: Summary and conclusions.

Our website includes capacity development documents and resources and a copy of the 2020 report.

1.1 How this report is made available to the public

This and all past reports are available to the public at the Colorado Department of Public Health and Environment’s website at <https://cdphe.colorado.gov/water-quality-publications>, and the Safe Drinking Water Program’s Aqua Talk blog, <https://aquatalk-colorado.blogspot.com/>

2.0 Overview of the Safe Drinking Water Act

The Safe Drinking Water Act, originally enacted in 1974, established a national program to ensure the safety of drinking water for the public by public drinking water systems. The original emphasis was directed primarily at establishing maximum contaminant levels in water supplied at the consumer’s tap. It also provided grant funding and authority to states to implement the public water system supervision program after receiving EPA approval called primacy.

In 1986, the act was significantly amended to improve control of microbiological contaminants, organic contaminants from natural and artificial sources, sources of contamination after water treatment and during distribution as well as to encourage protection of drinking water sources.

Regulations developed by the EPA to address the requirements of the 1986 amendments began the transition to a set of significantly more complicated and protective regulations. However, broad transformation for the act and its implementing framework arrived with the 1996 amendments. These amendments continued the traditional regulatory approach but on a more demanding schedule. The amendments established a strong new emphasis on preventing contamination and creating new public water systems with adequate technical,

managerial, and financial capacity. Associated costs were in part paid for by the newly authorized Drinking Water State Revolving Fund capitalization grant. Four explicit themes characterize the 1996 amendments:

- Making more and better information about drinking water available to consumers.
- Improving drinking water regulation development with better science, risk assessment, and prioritization of effort.
- Providing new funding for infrastructure construction through the Drinking Water State Revolving Fund and for state drinking water programs through the use of set-asides from the loan fund capitalization grant.
- Encouraging new and stronger approaches to prevent drinking water health risks through source water protection, operator certification, and capacity development programs.

In 2018, the act was again amended by the American Water Infrastructure Act, which added the following provision to the Safe Drinking Water Act:

“SDWA 1420. Capacity Development

(c)(2)(F) a description of how the state will, as appropriate-

(i) encourage development by public water systems of asset management plans that include best practices for asset management; and

(ii) assist, including through the provision of technical assistance, public water systems in training operators or other relevant and appropriate persons in implementing such asset management plans.”

This provision protects America’s continued Drinking Water State Revolving Fund investment in drinking water infrastructure by requiring the promotion of asset management. Asset management is the practice of managing infrastructure capital assets to minimize the total cost of owning and operating them while delivering the service level customers desire and that complies with drinking water regulations. This provision aligns with the EPA’s strategic measure of reducing the number of public water systems with health-based violations by ensuring the long-term sustainability of public water systems. States have amended their capacity development strategies to include asset management goals and a description of how public health protection is enhanced.

2.1 Required state activities

To maintain primacy, the Safe Drinking Water Act requires that states adopt regulations that are at least as stringent as new or amended federal regulations and maintain adequate procedures for enforcement of such regulations. **The EPA is required to revoke the state’s primary enforcement authority and all associated federal funding that supports the safe drinking water program if the state fails to perform these activities.** In fiscal year 2023, the combined federal program and capitalization grant to Colorado was approximately \$38 million. This includes dollars from the BIL. Without these funds, the state would not have the resources to provide compliance assistance or infrastructure improvements, and Colorado public water systems would still be subject to compliance with all of the national primary drinking water regulations and new requirements of AWIA and the BIL.

Colorado has completed all mandatory activities under the act to maintain the EPA’s approval of the state’s primary enforcement authority and the capacity development program.

2.2 Voluntary state activities

As listed in the 1996 amendments, voluntary state activities include operator certification, the revolving fund loan program, and the capacity development program.

Failure to implement voluntary activities would not result in loss of primacy but would result in losses to the capitalization grant. In 2023, failure to implement a capacity development strategy would have resulted in a loss of nearly \$8 million in federal set-aside funding. More importantly, these activities represent essential components of a public health program based on the prevention of human health impacts rather than after-the-fact correction.

Operator certification: The Colorado operator certification program oversees approximately 5,500 certified water and wastewater operators. Program activities include establishing and maintaining standards and procedures for the testing and certification of new operators, ongoing professional development, operator recertification, establishing and maintaining minimum standards of performance for certified operators, enforcing the requirement that each water and wastewater facility be under the supervision of a certified operator in responsible charge, classification of all water and wastewater facilities, and the discipline of operators who violate provisions of certification.

Drinking water state revolving fund:

In 1996, the Drinking Water State Revolving Fund was established to make funds available to drinking water systems to finance infrastructure improvements. A partnership of Water Quality Control Division staff, the Department of Local Affairs, and the Colorado Water Resources and Power Development Authority manages the fund. This partnership has proven effective and enhances the integration of the fund with other loan and grant programs supported by the state or other federal agencies.

Capacity development program: The Safe Drinking Water Program implements a capacity development program that aligns with the requirements of the act.

The EPA has approved the capacity development strategy and set-aside work plans maintained by the community development and partnership section of the safe drinking water program.

2.3 Capacity development strategy

As part of a capacity development program, the 1996 amendments require states to develop a capacity development strategy to help public water systems achieve and maintain technical, managerial, and financial capacity. This strategy serves as the foundation of work planning efforts to guide program activities. Colorado's capacity development strategy is revised regularly, most recently in 2022, to meet the new requirements mandated by the American Water Infrastructure Act.

The capacity development strategy focuses on three key areas: program administration, new drinking water systems, and existing drinking water systems. The strategy has ten goals, each directed at one or more key areas. The following table shows which safe drinking water program sections have primary responsibility for each strategic goal of Colorado's Capacity Development Strategy (see section 3.0 for the specific activities completed by each section):

Strategic Goal 1: Provide a system of education, training, and technical assistance that assures the public that their drinking water is consistently safe.

Key area(s): new drinking water systems, existing drinking water systems

Responsible section(s)	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section Engineering Section Field Services Section 	<ul style="list-style-type: none"> Provide continued one-on-one water system training and technical assistance through the local assistance unit's (LAU) capacity coaching and training team, other Safe Drinking Water Program groups and other technical assistance providers. Provide continuing education training units to certified operators who complete one-on-one water system training and technical assistance through the local assistance unit's capacity coaching and training team, other Safe Drinking Water Program groups, and other technical assistance providers.
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Prioritize the order in which assistance is provided. Colorado has the capacity to provide assistance to all systems that request it, so no prioritization is warranted outside of scheduling to accommodate system and staff needs (e.g., a system with a sanitary survey in the next two weeks will be scheduled for assistance before a system with a SS in two months). Assistance outreach efforts (such as email blasts, letters, and Aqua Talk articles) target systems: <ul style="list-style-type: none"> With an Enforcement Targeting Tool (ETT) score greater than 11. With significant compliance issues (e.g., repeated monitoring violations or lack of communication from the system regarding compliance issues). Identified to be re-classified as groundwater under the direct influence of surface water. Scheduled for a sanitary survey in the next year. With significant deficiencies/violations or recommendations based on sanitary surveys. That are newly discovered/regulated. Applying for infrastructure loans. Prioritize delivery of assistance based on a combination of the following factors in the case where the demand for assistance exceeds capacity: <ul style="list-style-type: none"> ETT score is greater than 11. Technical, managerial, and financial evaluation score (preference given to deficiencies in asset management). Whether or not systems serve underserved communities (utilizing Environmental Justice (EJ) screen or other tools as applicable). <p>An example of a system that would be a priority is a small community groundwater system in a low-income, rural community with little technical, managerial, and financial capacity. The ETT will likely serve as the tiebreaker if needed. An example of a system that would be a lower priority is a medium-sized community surface water system with acceptable technical, managerial, and financial capacity and low ETT and requesting a refresher on how to prepare for a sanitary survey.</p> Apply Drinking Water State Revolving Fund set-asides to leverage and support training and technical assistance partnerships with a diverse group of Colorado businesses, agencies, schools, and nonprofit organizations statewide.

	<ul style="list-style-type: none"> Support and maintain source water assessment and protection program efforts designed to provide the public consumer with information about their drinking water, as well as provide the community a way to get involved in protecting the quality of their drinking water.
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Strategic Goal 2: Develop and apply a measurement system for all capacity development projects to ensure the program has a measurable and documented beneficial impact on public health, compliance rates, and public trust in the state drinking water program and in their own public water supplier.

Key area(s): program administration

Responsible section(s)	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Implement a technical, managerial, and financial assessment process. Systems requesting assistance are required to complete a technical, managerial, and financial assessment every three years to identify deficiencies, including using asset management to establish a baseline for the system’s progress. If assistance is unavailable, the Local Assistance Unit will work to develop or provide opportunities for the needed assistance. Leverage the results from other Safe Drinking Water Program groups’ extensive analysis to identify and evaluate trends in compliance failures and areas of greatest weakness in water systems. Analytical results have identified failure to plan as a key shortcoming of Colorado water systems. These analytic results provide a valuable baseline for comparing, measuring, and evaluating the effectiveness of capacity development program activities Continue to develop and implement project-specific measures to translate project efforts and accomplishments into measurable outcomes. Focus measurement on outcomes of improvement to public health.

Strategic Goal 3: Apply a proactive approach to systems of concern so these systems have the tools and resources needed to regain compliance and full capacity.

Key area(s): program administration, existing drinking water systems

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section Compliance Assurance Section Field Services Section 	<ul style="list-style-type: none"> Utilize the list of enforcement targeting tool outputs to identify systems that might lack technical, managerial, or financial capacity and prioritize assistance efforts. Utilize system-reported data and information to proactively identify trends that suggest a system might lack technical, managerial, or financial capacity and prioritize assistance efforts.
<ul style="list-style-type: none"> Community Development and Partnership Section Compliance Assurance Section 	<ul style="list-style-type: none"> Provide targeted assistance to systems to prepare for and sample in calendar years when due dates of longer-term compliance schedules coupled with ongoing sampling requirements culminate in increased sampling and pose greater than normal system compliance challenges.

<ul style="list-style-type: none"> • Compliance Assurance Section 	<ul style="list-style-type: none"> • Support and enhance the efforts of the Safe Drinking Water Program to monitor water system compliance with water quality laws and regulations, detect non-compliance, and respond to violations quickly, fairly, and consistently to limit harm to the public and the environment.
<ul style="list-style-type: none"> • Field Services Section • Engineering Section 	<ul style="list-style-type: none"> • Support and enhance the efforts of the Safe Drinking Water Program to conduct sanitary surveys of public water systems, review public water system designs for conformance with design criteria, prepare and distribute technical assistance materials, and track system compliance with follow-up requirements.
<ul style="list-style-type: none"> • Community Development and Partnership Section 	<ul style="list-style-type: none"> • Collaborate with Water Quality Control Division staff to leverage and focus resources on systems with issues indicative of a lack of technical, managerial, and financial capacity. This may include but is not limited to a lack of asset management plans, ongoing compliance issues, and technical issues such as disinfection, disinfection byproduct, and/or radionuclide issues. • Integrate partnerships with drinking water technical assistance (TA) providers, associations, and other non-profit organizations to apply their resources toward assisting systems of concern. <ul style="list-style-type: none"> ○ TA providers include Environmental Finance Center Network (EFCN), Rural Communities Assistance Corporation (RCAC), Colorado Rural Water Association (CRWA), Indigo Water Group, and any additional partners identified in the future. ○ TA resources that are currently available and shared with partners include training slide decks, activities completed during group trainings, technical, managerial and financial assessments, asset management tools (asset inventory, capital improvement plans, SMART goals generators, level of service goal evaluator template, operations and maintenance planning templates, and many of these resources shared from other utilities as best practice examples), regulatory guidance, FAQ documents, and other templates. These resources are continuously developed and improved, and we anticipate no gaps in our ability to provide these services to any system that requests regulatory coaching, technical, managerial, and financial evaluation and capacity building, and asset management assistance. • Approach asset management broadly and consider capital, equipment, and supplies as assets, people, and expertise. Systems struggling to comply with regulations likely have asset management deficiencies. By targeting for assistance those systems with compliance deficiencies (ETT score > 11 or significant deficiency etc.), Colorado leverages this connection between compliance deficiencies and asset management. Systems requesting assistance will complete a technical, managerial, and financial assessment identifying specific asset management deficiencies. Addressing asset management in this broad sense (when they are a root cause) improves other technical, managerial, and financial capacity elements. For example, system A's system revenue is found to be deficient, and a rate study indicates a necessary rate increase. When implemented, the system will have the funds to hire and maintain a certified operator, who can maintain and implement asset management plans and operations & maintenance manuals to train future staff. This results in enhanced technical capacity for system A.

Strategic Goal 4: Develop a program that will support collaboration among all drinking water systems, help smaller systems understand their problems and potential solutions, and use performance-based approaches to developing training. (KFA 3; SDWA 3, 5, 6)

Key area(s): existing drinking water systems

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Continue to implement the excellence program in which participants are required to share learning, successes, and tools with other water systems to help foster success and good relationships. Support and enhance the efforts of the Safe Drinking Water Program to promote sustainable asset management and planning; source water, treatment, and distribution best practices and optimization; and provide training and recognition for public water systems in Colorado. Expand and enhance performance-based training based on the EPA area-wide optimization program model as a second step after asset management implementation. This work will help optimize technical, managerial, and financial capabilities, including asset management. The program will use a “get it done and working first, then optimize” approach, which is included in Colorado’s Resiliency training curriculum. Support Safe Drinking Water Program excellence initiatives in source protection, distribution systems, and other operations and management areas. Leverage Safe Drinking Water Program excellence initiatives, when appropriate, to incentivize water systems to develop asset management plans that include asset management best practices and innovation. Support Safe Drinking Water Program excellence initiatives at groundwater systems to enable all systems, especially smaller systems to strive for excellence. Expand Safe Drinking Water Program excellence initiatives to provide opportunities for individual certified operators to pursue excellence.

Strategic Goal 5: Use available resources in an efficient and timely manner, with a focus on continuous improvement of the program.

Key area(s): program administration

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Ensure that the capacity development program guiding principles and strategic goals are integrated into all processes and procedures of the Safe Drinking Water Program. Leverage and utilize program planning tools to direct decisions on work plan priorities.

Strategic Goal 6: Develop and distribute an effective needs assessment to drinking water systems in Colorado that evaluates technical, managerial, and financial needs. The needs assessment will focus on asset management planning and capital needs. In an attempt to communicate the importance of

this work and to reinforce the culture of health, the assessment results will stress the impacts of technical, managerial, financial, and asset management shortfalls on system performance and on the health of the populations served. This assessment will identify factors that impair technical, managerial, financial, and asset management capacity development for systems. These factors could be a lack of understanding, lack of adequate financial resources, lack of will, lack of know-how, lack of time, or lack of understanding of the importance and benefit of the development of technical, managerial, financial, and asset management capacity.

Key area(s): program administration, new drinking water systems, existing drinking water systems

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Utilize resources developed by other states and organizations in assessing needs of drinking water systems, and develop an assessment tool for Colorado that measures needs as well as program effectiveness. Develop and distribute assessment tools, and analyze results. Incorporate ideas and suggestions into the strategic and work plans of the program. Implement a mandatory technical, managerial, financial, and asset management assessment program in which systems requesting assistance are required (as a condition of assistance) to complete a technical, managerial, and financial assessment once every three years. This assessment will identify technical, managerial, financial, and asset management capacity deficiencies and provide a capacity score for the system. This score will serve as the baseline for the next three years to measure the system's progress and to determine what assistance would most benefit the system. If assistance is unavailable, the Local Assistance Unit will work to develop or provide opportunities for the needed assistance.

Strategic Goal 7: Integrate sustainability into program projects wherever possible to ensure that resource expenditures develop ongoing programs that provide measurable impacts and do not result in a short-term, single project. Asset management deficiencies often lead to underlying and ongoing technical, managerial, and financial issues. By integrating asset management into the technical assistance efforts, more long-term solutions for systems technical, managerial and financial goals will be created. This integration will also help use the Safe Drinking Water Program's resources more effectively by eliminating root causes of problems before they escalate.

Key area(s): program administration

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section Compliance Assurance Section Field Services Section Engineering Section 	<ul style="list-style-type: none"> Support and provide cross-media cooperation in inspections, enforcement, compliance assistance, and technical assistance coaching where possible, and utilize conservation of resources where practical.
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Continue to provide technical expertise and assistance to local watershed initiatives, local governments, and community and non-community drinking

	water systems in obtaining technical and financial assistance (including asset management) to develop, implement, and ensure the long-term success of source water protection plans.
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Strategic Goal 8: Ensure all new systems have adequate technical, managerial, and financial capacity to remain a viable and sustainable drinking water system into the foreseeable future.

Key area(s): new drinking water systems

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Engineering Section 	<ul style="list-style-type: none"> Conduct technical, managerial, and financial capacity and asset management reviews for all new water systems to ensure that these systems will operate into the future with fewer difficulties, be financially secure, and managed to the interests of the water users in mind.
<ul style="list-style-type: none"> Engineering Section Community Development and Partnership Section 	<ul style="list-style-type: none"> Offer assistance to new systems after they conduct a mandatory technical, managerial, financial, and asset management assessment as a part of the SDWP Engineering Section’s design approval process.
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Utilize results from technical, managerial, financial, and asset management capacity reviews to target systems to offer technical, managerial, financial, and asset management assistance.
<ul style="list-style-type: none"> Community Development and Partnership Section Compliance Assurance Section 	<ul style="list-style-type: none"> Track the compliance status of all new systems for three years following start-up and intervene at any point the system appears to lack adequate capacity by providing assistance and training to ensure continued compliance. This includes utilizing the list of enforcement targeting tool outputs to identify systems that might lack technical, managerial, financial, or asset management capacity and referring those systems for assistance.

Strategic Goal 9: Establish and foster partnerships with other federal, state, and local drinking water organizations.

Key area(s): program administration

Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> Community Development and Partnership Section 	<ul style="list-style-type: none"> Establish and foster training partnerships statewide to encourage capacity development by providing additional assistance and training opportunities distinct from the opportunities delivered directly by state staff. Training partnerships also provide the chance to share success stories amongst training partners to increase the quality and effectiveness of assistance. Enhance communication and collaboration with the Colorado operator certification program to ensure that available training services meet operator training needs and professional development goals. Identify and overcome barriers associated with cross-program work planning and coordination. Continue to foster partnerships through Colorado’s water/wastewater agency response network and state and national incident management

	system initiatives to promote security and all-hazards preparedness throughout the state's drinking water community.
<ul style="list-style-type: none"> • Engineering Section • Community Development and Partnership Section 	<ul style="list-style-type: none"> • Direct and support local health departments and counties utilizing set-aside funds, when available, to conduct field evaluations of non-community groundwater systems.
<ul style="list-style-type: none"> • Community Development and Partnership Section • Compliance Assurance Section • Field Services Section • Engineering Section 	<ul style="list-style-type: none"> • Participate in and give presentations at national and regional EPA-sponsored capacity development workshops and conferences. • Work with the Colorado Water Resources and Power Development Authority, Colorado Department of Local Affairs, and other state agencies to coordinate capacity development efforts.
<p>Strategic Goal 10: Encourage the development by public water systems of asset management plans that include best practices for asset management and assist public water systems in training operators or other relevant and appropriate persons in implementing such asset management plans.</p> <p>Key area(s): new drinking water systems, existing drinking water systems</p>	
Primary section(s) responsible	Goal elements
<ul style="list-style-type: none"> • Community Development and Partnership Section • Engineering Section • Field Services Section 	<ul style="list-style-type: none"> • Describe the importance of asset management and offer asset management assistance as part of all water system training and technical assistance through the local assistance unit's capacity coaching and training team, other Safe Drinking Water Program groups and other partner technical assistance providers. • Utilize results from needs assessments such as technical, managerial, financial, and asset management assessments and/or sanitary survey findings to identify and offer targeted assistance to water systems lacking technical, managerial, financial, and asset management capacity. In Colorado, all new community and non-transient, non-community systems must submit a completed capacity (technical, managerial, and financial) assessment for approval by the WQCD Engineering Section. Systems lacking technical, managerial and financial capacity (including asset management) are encouraged to contact the WQCD Local Assistance Unit to request assistance resolving deficiencies. • Additionally, field inspectors identify technical, managerial and financial capacity deficiencies during sanitary surveys and systems are again encouraged to contact LAU to request assistance resolving deficiencies. Systems that request assistance from LAU are additionally required to complete a triennial technical, managerial and financial assessment to further refine the technical, managerial and financial capacity needs of the system and to establish a baseline to measure progress.
<ul style="list-style-type: none"> • Community Development and Partnership Section 	<ul style="list-style-type: none"> • To guide water systems through the process of developing an asset management plan, targeted assistance will apply the EPA five core questions and one additional Colorado-specific question of an asset management framework: <ul style="list-style-type: none"> 1. What is the current state of the utility's assets?

Having an asset inventory with information about the current state of a water system's assets is an essential step because it is impossible to manage assets until water systems know where the assets are, how many they have, and which ones would be considered critical to the system's operation. Under this core question, water systems generate or review and update an asset inventory and determine the current state of their assets. Through technical, managerial, financial, and asset management assessments, LAU coaching staff encourage systems to identify and utilize current asset management (AM) software to map inventory assets. Part of this identification process for AM software includes coaches suggesting that the target system reach out to other systems that have integrated software into their AM program.

Use the following approaches as applicable to the system when assisting with asset management planning: asset inventory tools, system mapping, asset management software, or asset management requirements.

2. What is the utility's required "sustainable" level of service?

The required sustainable level of service is the utility's short-and long-term performance standards that consider the customers' expectations. Level of service goals help systems to focus their efforts and resources on mutually-agreed-upon service levels. Under this core question, water systems use quality, quantity, reliability, and environmental standards to help define level-of-service and associated system performance goals. LAU coaches help systems evaluate their "sustainable level of service" and the tools, resources, and personnel required to maintain that sustainable level of service. Tools to help determine this include asset inventory, SWOT (strengths, weaknesses, opportunities, and threats) analysis, and personnel evaluation (who knows what).

Use the following approaches as applicable to the system when assisting with asset management planning: training for setting level-of-service goals, customer service training, asset management software and/or other approaches as applicable.

3. Which assets are critical to sustained performance?

A water system's asset management program acknowledges the most critical assets, helps the system prioritize resource expenditures, and implements a maintenance schedule. Under this core question, the water system conducts a criticality analysis, during which they look at the importance of each asset and think about what the consequences would be if the asset failed tomorrow. LAU coaches use Environmental Finance Center and EPA templates for criticality assessment, striving to determine the consequences of each asset's failure. Lack of records or expertise are potential barriers to completing assessments. LAU staff work to identify personnel that could develop that expertise or provide administrative support.

Use the following approaches as applicable to the system when assisting with asset management planning: asset inventory tools, identifying high-risk assets planning, asset management software and/or other approaches as applicable.

4. What are the utility’s best “minimum life-cycle cost” capital improvement plan and operations and maintenance strategies?

According to EPA, capital improvement plans (CIPs), operations and maintenance (O&M), and personnel expenditures account for approximately 85 percent of a typical system’s expenses. Asset management enables a system to determine the lowest life-cycle cost options for providing the highest level of service over time. Asset management programs help water systems to make risk-based decisions by choosing the right project at the right time for the right reasons. This core question identifies best O&M strategies by scheduling and tracking maintenance tasks through work orders and managing budgeted and actual annual expenses and revenue. Water systems also use CIPs to plan larger-scale asset development by determining when assets will be replaced and the cost of replacing them. The stages of the CIP process are project identification, preliminary feasibility design, detailed design process, construction, and commissioning. The state assists systems in understanding “minimum life cycle costs” in capital improvement plans and operation and maintenance plans and how they are critical to sustained performance by including these lessons in all provided assistance, including classroom training and one on one assistance. The state maintains and delivers a full asset management curriculum whose training objectives cover all critical aspects of AM.

Use the following approaches applicable to the system when assisting with asset management planning: capital improvement planning, computerized maintenance management systems, and O&M questions in sanitary surveys and/or other approaches as applicable.

5. What is the utility’s best long-term financing strategy?

Knowing the full economic costs of services provided is critical for making sound financial decisions and devising a long-term financing strategy to provide services at the best appropriate cost. That knowledge is also critical for developing an effective long-term funding strategy. Having this information in an asset management plan will help tell the “story” and communicate information to decision-makers and customers. Under this core question, water systems consider their budget on capital expenditures, infrastructure, as well as operating expenditures. Under this core question, water systems also review their rates and rate structure to ensure they charge customers appropriately and make adjustments as necessary. The state helps systems understand the importance of developing a long-term financial strategy by including this lesson in all provided assistance, including classroom training and one-on-one assistance. As mentioned previously, the state maintains and delivers a full asset management curriculum whose training objectives cover all critical aspects of AM. Failing to understand if the system has enough money to maintain assets for identified required level of service and whether or not their rate structure is sustainable for the long term is a barrier that may hinder success but will be addressed through education.

Use the following approaches applicable to the system when assisting with asset management planning: rate-setting dashboards and/or other approaches.

6. Additional Colorado-specific core question of an asset management framework: How will the utility ensure its asset management plan is implemented and maintained?

One barrier to successful asset management planning is staff turnover. The implementation of asset management systems, along with the identification of barriers and how to overcome them, will be coached. Barriers may include a lack of succession planning, lack of incorporation of asset management plans in written O&M manuals and SOPs, not formally adopting implementation strategy and asset management plan by decision-makers.

Specific capacity development program activities designed and implemented to achieve goals contained in the capacity development strategy are described in the following section.

3.0 Colorado capacity development activities

Drinking water state-revolving fund work plans describing goals and activities must be submitted to the EPA for the capacity development program. Two additional work plans were submitted to the EPA in July of 2022 for dedicated lead service line replacement and the other for emerging contaminants. The EPA reviews and approves each work plan. Colorado also identifies work plan activities and costs for each set-aside in the annual intended use plan for the capitalization grant, which is presented to and approved by the Water Quality Control Commission.

Work plan development occurs on a five-year schedule to allow for flexibility in the staging of projects. Work plans often continue many of the elements of the previous work plan periods to allow for continuity of capacity development activities.

Revised in July of 2023, all work plans allow Colorado to utilize the additional funds provided by the federal BIL.

It is important to note that work plan development is guided by analyzing compliance data and needs assessments that evaluate water systems' technical, managerial, and financial capacity to identify and evaluate trends in failures and areas of greatest weakness. Analytical results have identified failure to plan as a key shortcoming of Colorado water systems. Furthermore, these analytical results provide a valuable baseline for comparing, measuring, and evaluating the effectiveness of capacity development program activities. Various other factors including new regulations and other Colorado Initiatives also guide work plan development.

The following sections describe the capacity development activities of the safe drinking water program, including the community development and partnership, drinking water compliance assurance, and engineering and field services sections. Select capacity development activities of the Water Quality Control Division's standards unit are also described.

3.1 Community development and partnership section

The community development and partnership section includes the capacity coach and training team, the drinking water pursuing excellence program, the facility and operator outreach and certification board liaison, and the source water assessment and protection program.

The section provides training, assistance, and management support services to public water systems to strengthen their ability to supply safe drinking water to the public. The section provides capacity coaching

and training services, security and emergency preparedness services, and drinking water excellence awards. It utilizes Drinking Water State Revolving Fund set-asides and other EPA grants to retain contractors to provide additional services. The source water protection program focuses primarily on voluntary preventative strategies to protect drinking water sources before treatment. The unique combination of functions provides enhanced operator training, contaminant prevention strategies, and public drinking water system assistance. Finally, the section is responsible for providing division staff, the Water and Wastewater Facility Operators Certification Board, and facility owners and operators expert advice and assistance on operator certification policy and regulatory matters and making recommendations regarding certified operator disciplinary actions.

The community development and partnership section shares responsibilities of responding to acute drinking water emergencies within the state with other safe drinking water program sections and units.

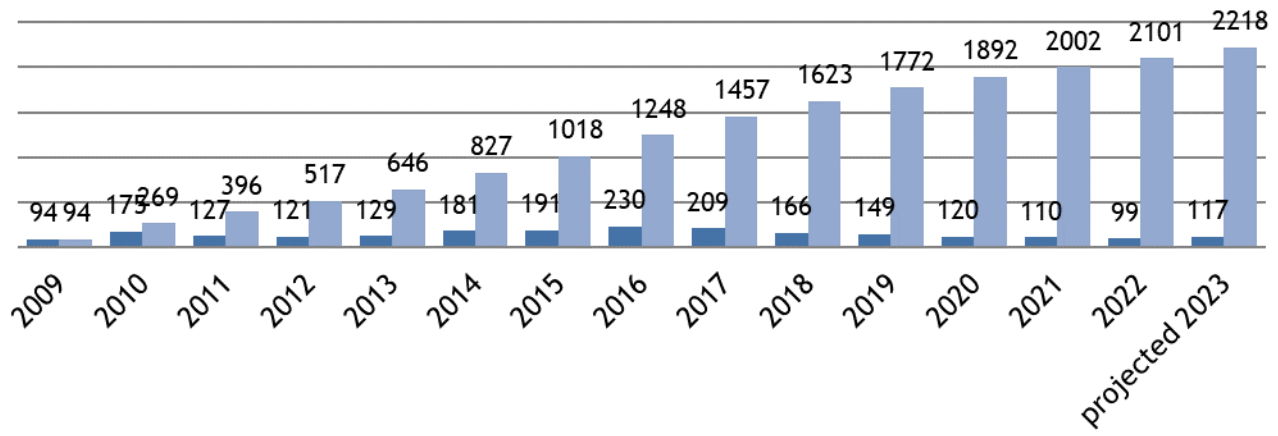
Capacity coaching and training services

The capacity coach and training team includes three technical, managerial, and financial capacity coaches. One of the coaches is a certified water professional with operator certificates in water and wastewater treatment and collection and distribution systems. The second coach is a specialist in water system managerial and financial capacity. The third coach is a specialist in training development and implementation. Capacity coaches provide onsite training and technical, managerial, and financial assistance to small systems throughout Colorado. Coaching priorities include ensuring adequate disinfection, supporting the development of monitoring plans and other system documentation, assisting systems struggling to comply with regulatory requirements, and coaching select systems needing in-depth capacity-building support to deliver safe drinking water. During each site visit, capacity coaches work closely with water system owners and operators to troubleshoot and improve water system performance, address technical questions, explain complex regulatory requirements, and assist owners and operators in resolving system deficiencies identified through sanitary surveys. In 2022, 80% of systems receiving one-on-one coaching assistance made at least one improvement. So far in 2023, this number has improved to 83%.

The following chart shows the number of training and coaching events given each year to assist public water systems since the coaching program began in 2009. For 2023, capacity coaches are averaging 11 monthly coaching and training assistance events to help small systems deliver safe drinking water. The decrease in the number of events over the past few years is due to a shift to more “classroom” based training events. This approach increases efficiency as many one-on-one on-site assistance visits involve many hours of travel by the coach. However, it is often found that the system did not need the customized, in-depth assistance of a site visit and would have equally benefited from assistance in a group setting. The shift to this approach allows coaches to assist many systems simultaneously (18 systems per event on average). This approach results in fewer events overall while reserving capacity for the systems in the most need of targeted on-site assistance. The number of systems improved as a result of one-on-one coaching increased from 77% in 2020 to 83% in 2023. The 2020 COVID-19 pandemic also likely reduced the number of events provided by the coaching staff. However, adaptations have been made to both on-site and classroom events to provide assistance and training remotely, thus minimizing the impact.

Total Training & Coaching Events

■ Total Each Year ■ Running Total



Capacity coaches also support and conduct various special projects, workshops, and group training efforts requiring specialized technical experience. The coaches routinely represent the safe drinking water program in training activities with the Rocky Mountain Water and Wastewater Plant Operators School, the Colorado Rural Water Association, and the American Water Works Association. The coaches have partnered with EPA, local universities, community colleges, and industry to provide additional water operator training opportunities throughout the state. They also provide invaluable support in developing and facilitating new workshops for small water system operators.

Facility operator certification services

In 1999, the EPA issued operator certification program guidelines specifying minimum standards for certification and recertification for operators. The operator certification program aims to ensure that skilled professionals oversee the treatment and distribution of safe drinking water. Operator certification protects public health and the environment and promotes compliance with the Safe Drinking Water Act.

On June 22, 2001, the operator certification program was approved as consistent with the *Final Guidelines for the Certification and Recertification of the Operators of Community and Non-Transient Non-Community Public Water Systems*, 64 CFR 5916.

Colorado regulations require every water treatment and water distribution facility to be operated under the supervision of a certified operator in responsible charge holding a certificate equal to or greater than the classification of the facility. The regulation also requires all process control and system integrity decisions to be made by the certified operator in responsible charge or another operator holding a certificate equal to or greater than the facility's classification. This operator must always be available during operating hours of a water treatment or distribution facility. Colorado has 5,585 water and wastewater certified water professionals holding 12,404 certificates, of which 7,109 of those certificates are for water treatment and distribution.

Compliance with operator certification requirements is a safe drinking water program priority. In 2022, the compliance rate with the certified operator requirements was 98 percent.

The certification board liaison outreach efforts include participating in and presenting at conferences, seminars, and training events. These presentations provide additional opportunities for contact with the

public, public water system owners, special district and town boards, trustees, city councils, and other municipal officials and certified water professionals.

Security and emergency preparedness services

The division provides security and all-hazards emergency preparedness and response services to the state's drinking water community. Services include educating the drinking water community through courses, workshops, exercises, and information exchange; providing tools and resources for developing and implementing emergency planning capabilities; and fostering partnerships through Colorado's Water/Wastewater Agency Response Network (CoWARN) and the National Incident Management System (NIMS) initiative.

- The security and emergency preparedness services continue to support utilities by maintaining and hosting the CoWARN website, sponsoring meetings, participating in steering committee decisions, providing resources and tools in security and emergency preparedness, and providing training.
- NIMS provides a consistent nationwide approach for state, local, and non-governmental organizations to work together to prepare for, respond to, and recover from domestic incidents. The security program brings NIMS training to its stakeholders by hosting courses developed and offered by the EPA, Department of Homeland Security, and Urban Area Security Initiative.

Drinking water excellence awards

The Pursuing Excellence Program encourages regulated entities to maintain long-term compliance, exceed regulatory compliance, and/or take proactive steps to overcome challenges, all to ensure that an entity is operating at the highest possible level to protect public health and the environment. The awards program results from collaboration between the department, drinking water utilities, industry, and universities. The program consists of two branches, one of which awards high-performing systems each year, and the other provides funding to help struggling systems. This other branch is called the Assistance Grants Program.

The Assistance Grants Program awards funds up to \$25,000 to systems with an identified infrastructure need. Since 2018, the program has awarded funds to 26 systems, totaling \$663,011, with contracts to award an additional six systems and spend \$145,000 in 2023. Some projects include improved filtration, additional water system security, improving the emergency interconnection between two small rural systems, installing optimal corrosion control treatment, repairing and inspecting tanks, and installing nitrate treatment.

Training partnerships

A well-trained workforce is integral to providing safe drinking water. Until the last couple of years, set-aside funds used to support and fund training and technical assistance have decreased since 2014, forcing reductions in those activities. This includes adjusting historical partnerships with diverse businesses, agencies, schools, and nonprofit organizations statewide. The support is now almost entirely in kind and consists of lending time and expertise as resources allow.

The following describes the current status of the historical and current partnerships since 2017.

Short schools: The Rocky Mountain Water and Wastewater Plant Operator School and the Colorado Distribution and Collection Systems School are offered each year (but were canceled in 2020 due to COVID-19). In addition, the Leadville Operators Training Conference is offered in Leadville each year (also canceled in 2020 due to COVID-19). Each school is typically four or five days and covers either basic or advanced curriculum in drinking water treatment or distribution system management. For many years, these schools have not received state subsidies offered through the Drinking Water State Revolving Fund set-aside funds, and thus participant registration fees have likely increased.

Treatment and distribution system training: Colorado has partnered with training committees from the Rocky Mountain Section of the American Water Works Association to develop and provide operator

workshops throughout the state. Workshop attendees receive in-depth, hands-on instruction on water main breaks, storage tank maintenance and management, filtration, and disinfection best practices, sampling techniques, and preventing cross-connections. Operator demand for the classes has consistently exceeded available class space.

Storage tank baffling factor studies:

Many small water systems' current treatment system design needs help in meeting the requirements for adequate disinfectant contact time for their disinfection. In partnership with Colorado State University, a three-year study focused on treatment system designs that enhance contact time and provide simple guidance to water systems for providing adequate contact time from existing or new tanks. Coaches and other staff use the results of this project to provide significant time and cost savings options for small water systems across the state. Additionally, the coaches and other staff assist small systems in performing on-site tracer studies so they can better understand the disinfection they are achieving.

Distribution systems training center: The division and Red Rocks Community College in Lakewood, designed and constructed a hands-on training facility for water distribution operators in 2012. This project is the culmination of a joint partnership that leveraged federal grants supplied by the drinking water program, donations made by public water utilities, and labor volunteered by Red Rocks Community College students and staff. This outdoor training center consists of five hands-on elements designed for students and operators to gain skills and experience in safe and reliable drinking water distribution. Utilities are currently using the facility to train their distribution system operators and community college courses to train students. The section continues to support the college by providing guest lectures on regulations and partnering with the curriculum steering committee.

Public water system training grants program: The state has historically utilized Drinking Water State Revolving Fund set-asides to support training projects that improve technical, managerial, and financial capacity for operators and owners of small public water systems in rural Colorado. The program awarded training grants of up to \$25k to selected training providers through a competitive process. Until recently, available set-aside funds have decreased; thus, no projects have been funded. This creates difficulty for the many operators and owners that don't have access to training opportunities due to the remote location of the rural areas they serve. However, starting in 2019, this grant program has been reinstated and will continue to be funded as available set-aside balances allow.

Source water assessment and protection

The Safe Drinking Water Act amendments of 1996 directed each state to develop a source water assessment program. This program is part of the Water Quality Control Division's source water assessment and protection program which is designed to provide the consumer with information about their drinking water and provide the community a mechanism to become involved in protecting the quality of their drinking water. In the first phase of the program, division staff/ trainers assess the public water supplies, providing an understanding of where each public water system's source water comes from, potential contaminant threats and source water susceptibility to those contaminants. In the program's second phase, public water systems are encouraged to develop and implement a source water protection plan incorporating community-based involvement and preventive management strategies to ensure that all public drinking water resources are kept safe from future contamination.

The source water assessment and protection (SWAP) program team manages and implements the integrated project plan, the wellhead protection program and set aside work plan (as part of the local assistance and other state programs set-aside work plan), and a statewide grant program providing technical and financial support for protection planning activities. The SWAP team provides source water protection entities with grant funding or technical assistance opportunities through the statewide grant program, including

- Protection plan development and implementation grants.
- Protection plan development and implementation financial and technical assistance.
- Susceptibility analysis continuation, new source water assessment area delineations, and report generation.
- Safe drinking water information system and other data and analysis tools improvements.

The team continues to coordinate with various divisions clean water and drinking water staff, including the watershed section, field services section, capacity coach and training team, and others, to improve source location data, provide technical expertise and assistance to local watershed initiatives, local governments, and community and non-community drinking water systems in obtaining technical and financial assistance to develop and implement source water protection plans.

The source water program has provided technical and financial assistance to complete the development and implementation of source water protection plans for 296 public water systems with a total financial assistance of \$1,448,187. The source water program has reported 257 substantially implemented protection plans covering approximately 3.1 million Coloradans.

3.2 Drinking water compliance assurance section

The drinking water compliance assurance section develops regulations and policies, establishes compliance requirements, monitors self-reported data, determines violations, maintains the public water system inventory, violation, and enforcement database, and tracks formal and informal enforcement actions. The section communicates regulatory requirements to public water systems through stakeholder processes, compliance assistance, and training activities. The section includes the compliance and enforcement north unit, the compliance and enforcement south unit, the technical and regulatory implementation and coordination unit, and the data, reporting, and records workgroup. The compliance assurance section shares responsibilities for responding to acute drinking water emergencies within the state with other Safe Drinking Water Program sections and units.

The compliance assurance section conducts the following capacity development activities and tasks:

General activity	Specific tasks
Drinking water training, and assistance to public water systems.	<ul style="list-style-type: none"> • Communicate effectively with systems to understand compliance responsibilities. • Provide training and assistance to public water systems. • Provide training and assistance to public water systems preparing to meet new regulations. • Develop and analyze policies and procedures that assist both public water systems and safe drinking water program staff. • Assist public water systems with understanding performance monitoring requirements and provide technical assistance.

3.3 Engineering section

The engineering section establishes and implements criteria for the proper design and operation of public drinking water facilities throughout Colorado by reviewing facility designs. The section provides technical, managerial, and financial reviews for all new water systems and technical reviews for treatment modifications and distribution system storage tanks for new and existing water systems. The section coordinates these activities amongst the various staff to meet timeliness goals on design reviews to maintain primacy for Colorado and ensure the protection of public health and the environment. The section also manages several projects which involve the formulation of policy for interpretation of the Colorado Primary Drinking Water Regulations (CPDWR) and establishes updates for the Design Criteria for Potable Water Systems. The engineering section, in cooperation with the drinking water compliance assurance section, is also responsible for helping make modifications to the CPDWR as necessary and providing

technical insight to the drinking water compliance assurance section regarding the technical interpretation and application of the regulations. The engineering section also supports enforcement with determinations of economic benefit, appropriate response schedules, and compliance assistance. It performs support services for the funding program with a review of technical-managerial-financial capacity, preliminary engineering reports, and eligibility assessments. The section shares responsibilities for responding to acute drinking water emergencies with other Safe Drinking Water Program sections and units.

The engineering section conducts the following capacity development activities and tasks:

General activity	Specific tasks
Drinking water sanitary survey	<ul style="list-style-type: none"> ● Perform sanitary surveys of public water systems. ● Identify significant deficiencies, violations, and observations. ● Follow-up with the system(s) regarding outstanding significant deficiencies. ● Oversee the quality and consistency of the sanitary survey program. <ul style="list-style-type: none"> ○ Lead internal training. ○ Develop standard operating procedures. ○ Standardize the outreach to public water systems. ● Oversee the sanitary survey training at operator schools.
Drinking water revised total coliform rule level 2 assessments	<ul style="list-style-type: none"> ● Perform level 2 assessments of public water systems. ● Identify sanitary defects. ● Follow-up with the system(s) regarding outstanding sanitary defects. ● Oversee the quality and consistency of the level 2 assessment program. <ul style="list-style-type: none"> ○ Lead internal training. ○ Develop standard operating procedures. ○ Standardize the outreach to public water systems. ● Oversee the level 2 assessment training at operator schools.
Drinking water technical assistance/support	<ul style="list-style-type: none"> ● Provide technical assistance to public water systems. ● Support the state revolving fund loan program by providing eligibility and capacity development reviews. ● Prepare and distribute technical assistance materials concerning proper operations. ● Provide technical leadership and consultation to the Safe Drinking Water Program and external entities. ● Serve as a technical leader on the SDWP's efforts for drinking water treatment techniques and emerging technologies, establishing and interpreting drinking water design criteria, drinking water treatment residuals management, challenging design or sanitary survey issues, addressing new drinking water rules, distribution systems, eligibility and capacity development review process to support the state revolving fund loan program. ● Technical review for treatment modifications and distribution storage tank for new and existing systems.

3.4 Field services section

The field services section ensures the proper operation of public drinking water facilities throughout Colorado by implementing the sanitary survey program. The section coordinates these activities amongst the various staff to perform the necessary inspections to maintain primacy for Colorado and ensure the protection of public health. This section shares responsibilities for responding to acute drinking water emergencies within the state with other program sections and units.

The field services section conducts the following capacity development activities and tasks:

General activity	Specific tasks
Drinking water sanitary survey	<ul style="list-style-type: none"> • Perform sanitary surveys of public water systems. • Identify significant deficiencies, violations, and observations. • Follow-up with the system(s) regarding outstanding significant deficiencies.
Drinking water revised total coliform rule level 2 assessments	<ul style="list-style-type: none"> • Perform level 2 assessments of public water systems. • Identify sanitary defects. • Follow-up with the system(s) regarding outstanding sanitary defects.
Drinking water training and assistance to public water systems	<ul style="list-style-type: none"> • Provide technical assistance to public water systems. • Prepare and distribute technical assistance materials concerning proper operations, backflow prevention, and storage tanks. • Provide compliance assistance to public water systems before, during, and after sanitary survey visits. • Assist public water systems to interpret filter profile results when performance goals are not achieved

3.5 Clean Water Program, standards unit

Within the Clean Water Program, a portion of the set-aside funds support staff in the standards unit to assist with evaluating drinking water sources and whether or not well water may be under the direct influence of surface water.

Specifically, the standards unit conducts activities and tasks associated with:

General activity	Specific tasks
Evaluate geology and hydrology for well sources	<ul style="list-style-type: none"> • Analyze geologic and hydrologic information. • Model groundwater movement. • Evaluate site geology. • Review consultants monitoring results. • Under the direction of the compliance assurance unit manager, train appropriate staff to assess water quality data for determination of groundwater under the direct influence of surface water.

4.0 Efficacy of the Colorado capacity development strategy

Colorado’s capacity development strategy has been an effective tool in guiding the development and implementation of capacity development activities designed to assist public water systems in building and maintaining technical, managerial and financial capacity. Incorporating the strategy into the Water Quality Control Division Safe Drinking Water Program’s major activities and the daily work of staff maximizes influence and efficacy.

Some specific outcomes from implementing the capacity development strategy include

- The provision of one-on-one technical assistance coaching site visits and classroom training to over 300 small public water systems from 2021 through 2023.
- In 2022, 80% of systems receiving one-on-one coaching assistance made at least one improvement in one of ten performance areas. So far in 2023, this number has improved to 83%. The following are

specific examples of improvements made at systems due to assistance from 2021 through 2023, organized by the ten different performance areas:

- Source water adequacy and protection by:
 - Closing and posting signage for unused wells.
 - Exploring additional wells for source water redundancy.
 - Conducting monitoring for determination of groundwater under the direct influence of surface water.
 - Rehabilitating existing wells.
 - Receiving new well permits.
- Treatment operations and maintenance by:
 - Completing the disinfection outreach and verification effort (DOVE).
 - Installing emergency treatment.
 - Correctly completing seasonal start-up procedures.
 - Reading and recording entry point and turbidity sample results at correct locations.
 - Receiving design approval from CDPHE.
 - Executing a written agreement for a certified operator in responsible charge.
- Disinfectant residuals management by:
 - Sampling with EPA-approved protocol for chlorine residual.
 - Correctly performing weekly entry point readings.
 - Correctly recording readings in CDPHE groundwater entry point log.
- Storage tank operations and maintenance by
 - Completing storage tank maintenance and repair per comprehensive inspection.
 - Creating an inspection plan.
- Distribution systems operations by:
 - Working with WQCD staff to correctly classify a system based on having only one distribution zone.
 - Identifying and sampling from new and correct total coliform locations in the distribution system.
 - Completing a cross-connection control survey.
 - Replacing lead service lines.
 - Correctly updating lead sample pools.
 - Creating distribution protection plans.

- Water quality monitoring and sampling by:
 - Properly maintaining monitoring equipment calibration records.
 - Scheduling annual monitoring equipment calibrations.
 - Accurately completing and submitting revised total coliform rule level 1 assessments.
 - Investing in the creation of sample stations.
 - Completing and submitting materials evaluation forms and correct lead sample sites through the drinking water portal.
 - Correctly conducting locational running annual average calculations.
- Cross-connection control by:
 - Creating and implementing backflow prevention and cross-connection control (BPCCC) programs and plans.
 - Accurate and timely completion of BPCCC annual reports.
 - Ensuring that water suppliers are tracking interconnect backflow devices.
- Emergency preparedness and response by:
 - Completing risk and resilience evaluations.
 - Completing emergency response plan evaluations.
 - Clarifying procedures for emergencies.
 - Joining the Colorado Water/Wastewater Agency Response Network.
 - Adding cybersecurity considerations to emergency response plans.
 - Connecting with critical customers.
 - Connecting with county partners.
 - Building emergency drinking water supply plans.
- Financial viability by:
 - Applying for state grant funds.
 - Completing 20-year cash flow analyses.
 - Successfully raising rates to adequately cover project costs and current certified operator costs.
- Managerial capacity by:
 - Creating yearly compliance schedules and maintenance logs.
 - Systems returning to compliance by the owner or other system personnel obtaining water treatment operator certifications.

- Establishing written definitions of roles for decision-makers and the certified operators, establishing compliance schedules by using division tools, setting up a drinking water portal account for session makers, and revising monitoring plans with current information.
 - Creating leadership roles and identifying backups for drinking water advisory situations.
 - Creating communications plans, including how to complete public notice.
 - Increasing the understanding of drinking water regulation requirements by system managerial and administrative staff.
 - Hiring new certified water operators.
 - Resolving violations and submitting required paperwork to return to compliance.
 - Correctly completing the required delegation of operator duties plans.
- Incorporation of asset management training into the LAU core curriculum. This ensures asset management approaches and principles are included to whatever degree is applicable in all LAU training. The incorporation of asset management into the LAU training curriculum began in June of 2023. Since then, approximately 78 public water systems and 138 individual operators and water system personnel have received some level of asset management training.
 - Implemented a technical, managerial, and financial worksheet and worked with 15 water systems to complete the assessment. Water systems requesting one-on-one coaching assistance complete this new needs assessment every three years. The worksheet evaluates and scores the system's overall technical, managerial, and financial capacity (including asset management) and serves as a benchmark to track system improvement over time.
 - The drinking water excellence awards and assistance grants program successfully implemented. Some of the participants in the program are doing projects that include improved filtration, additional water system security, improving the emergency interconnection between two small rural systems, installing optimal corrosion control treatment, repairing and inspecting tanks, and installing nitrate treatment.
 - The annual completion of over 295 on-site sanitary surveys of community water systems and oversight of approximately 174 field evaluations of non-community systems, with 156 of the non-community systems being groundwater systems.
 - The provision of technical and financial assistance to complete the development and implementation of source water protection plans for 296 public water systems with a total financial assistance of \$1,448,187; and the substantial implementation of 257 source water protection plans covering approximately 3.1 million citizens in Colorado.

Under the scope of the capacity development program, the Water Quality Control Division has continued to effectively utilize data to identify issues that drinking water systems face, direct training and technical assistance resources to the identified issues, coordinate solutions with training partners and stakeholder organizations, and report changes and outcomes to relevant parties.

The safe drinking water program has also successfully used state-revolving fund set-aside work plans to coordinate and communicate the key issues the program intends to address and how set-aside funds will be used to support program initiatives. Work plan development and implementation have directly contributed to the achievement of safe drinking water program successes such as no waterborne disease outbreaks since 2008, significant E. coli violation reduction (reduced from 134 in the 1990s to 56 in the 2000s to 34 in the

2010s, and currently on course to be even lower in the 2020s.) and the institution of a growing culture of health among program staff and water system owners, operators and utility staff. Overall, tap water in Colorado has never been safer, but there are still challenges for the future, as mentioned below.

5.0 Summary and conclusions

The Safe Drinking Water Act Amendments of 1996, the amendments to the Safe Drinking Water Act as mandated by the American Water Infrastructure Act of 2018, and the additional funding from the Bipartisan Infrastructure Law as enacted in the Infrastructure Investment and Jobs Act of 2021 substantially improve drinking water safety, while presenting many challenges to the safe drinking water program, including new regulatory requirements, source water protection, operator certification, plus revolving fund and capacity development program requirements. These laws also present many challenges to public drinking water systems in the state, challenges that many smaller systems have difficulty addressing. However, the laws also provide states with a funding mechanism to augment state and other federal funding to complete the many tasks the state must perform. This mechanism includes specific set-asides from the Drinking Water State Revolving Fund capitalization grant (including set-aside portions of the BIL), which provide funds for capacity development, program management, wellhead protection, and small system training and technical assistance. Colorado has developed and implemented a robust capacity development strategy to use set-aside funds to support public water systems to strengthen their ability to supply safe drinking water to the public.

This report provided details on the use of set-aside funds to accomplish these tasks and demonstrates that it is in Colorado's best interest to continue to support these efforts, provide the necessary state funds to keep drinking water programs effective and viable and continue to support program growth with the necessary state resources to make all public water systems in the state a strong, integral part of the state's public health protection efforts.

The Safe Drinking Water Program continues to implement a proactive and comprehensive cultural change program focused on the primary mission of protecting human health and designed to detect and address contaminants in public water supplies promptly. The program recognizes organizations with a broad, well-developed culture of health as the best equipped to deal with drinking water challenges. The safe drinking water program actively champions and pursues this culture of health and believes that the culture of health must extend to water system owners, operators, and utility staff.

Monitoring is not continuous but fixed in time, and regulations cannot cover all contingencies, and enforcement actions are taken after a problem has occurred.

Regardless of the regulations, monitoring, assistance, and enforcement, the only way to ensure continuous safe drinking water and sustainable drinking water systems is to proactively ensure all systems have the technical, managerial, and financial capacity to operate at the very best of their capabilities, and to support and empower operators and managers to strive for excellence and a culture of health in their daily operations.

5.1 Retention of drinking water program primary enforcement authority

The Colorado capacity development program is one part of the overall Safe Drinking Water Program. Federal funding will not be available to fund its activities unless Colorado retains primary enforcement authority for the Safe Drinking Water Act. Safe Drinking Water Program staff has continued to meet all the EPA requirements to retain primary enforcement authority. This ensures that Colorado public water systems receive the services that offer technical assistance and encourage compliance. The Safe Drinking Water

Program will continue implementing all activities under the Safe Drinking Water Act to ensure all available federal funding.

5.2 Retention of full capitalization grant allotment

The division must meet other requirements to retain the capacity in the development program, the related set-aside funding, and the full allotment of the Drinking Water State Revolving Fund capitalization grant.

These requirements include the development and subsequent approval by EPA of a capacity development strategy, work plan, and implementation report. Inadequate response in any of these areas can result in the EPA withholding a portion of the capitalization grant. Colorado has successfully complied with all requirements of this program during the three years of this reporting period.

5.3 Future challenges

The Safe Drinking Water Program receives approximately 80% of its funding through federal dollars, 15% from the general fund, and 5% from cash revenues. The most important challenge facing the program is maintaining adequate program funding.

In the past, state drinking water programs with primary enforcement authority received federal funding only through an annual performance partnership grant. However, the Safe Drinking Water Act Amendments of 1996 and the BIL provided additional funding through the annual federal capitalization grant in the form of set-asides. In fiscal year 2023, Colorado received the full amount of the annual federal capitalization grant set-aside funding (base Drinking Water State Revolving Fund program plus BIL) from the U.S. Environmental Protection Agency because the state is implementing a capacity development program that aligns with the requirements of the Safe Drinking Water Act. States that fail to implement a capacity development program are at risk of losing 20 percent of the capitalization grant. The fiscal year 2023 appropriation was larger than grants received in FYs 2021 and 2022 and is approximately \$16 million more than the FY 2020 appropriation. This is due to increases from the BIL, which comes with increases to the program's capacity to utilize the funds.

The Safe Drinking Water Program anticipates the continued use of Drinking Water State Revolving Fund capitalization grant funds to implement Colorado's capacity development program fully and to help public water systems achieve and maintain technical, managerial, and financial capacity and provide safe drinking water. The program anticipates future ongoing challenges associated with public water system aging infrastructure, the lead and copper rule revisions, and the challenges presented by unregulated contaminants in drinking water such as per- and polyfluoroalkyl substances.