



COMMONWEALTH of VIRGINIA

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Karen Shelton, MD
State Health Commissioner

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The Honorable Glenn Youngkin
Governor of Virginia
Post Office Box 1475
Richmond, VA 23218

RE: The Efficacy of Virginia's Capacity Development Strategy Report

Dear Governor Youngkin:

Section 1420 of the Safe Drinking Water Act (42 USC § 300g-9) requires states to develop and implement programs that will assist new and existing waterworks to possess sufficient technical, managerial, and financial capacity to ensure and enhance their sustainable operations. To fulfill this requirement, the Virginia Department of Health (VDH), through its Office of Drinking Water (ODW), has devised a Capacity Development Strategy. The U.S. Environmental Protection Agency (EPA) approved the original strategy in 2000 and the revised strategy in 2014. In January 2022, the EPA approved Virginia's updated Capacity Development Strategy to incorporate requirements of the America's Water Infrastructure Act (AWIA).

The attached report has been prepared pursuant to Section 1420(c)(3) and constitutes the eighth report on Virginia's Waterworks Capacity Development Program. Section 1420(c)(3) requires that every three years, VDH submit "to the Governor a report that shall also be available to the public on the efficacy of the strategy and progress made toward improving the technical, managerial and financial capacity of water systems in the State."

The Virginia Drinking Water State Revolving Fund Capitalization Grant, requiring matching State funding, from the EPA largely funds the efforts of ODW's Capacity Development Strategy. This financial support is critical to the continued success of this and many other ODW programs. Please review this report to gain an understanding of the significant work that ODW is doing to protect the health of all people in the Commonwealth of Virginia who receive and use water from a regulated waterworks.

If you, or your staff, have any questions regarding the contents of this report or ODW's Capacity Development Program, please contact Mr. Dwayne Roadcap, ODW Director at (804) 338-0371 or by e-mail at Dwayne.Roadcap@vdh.virginia.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Karen Shelton MD".

Karen Shelton, MD
State Health Commissioner

EFFICACY OF VIRGINIA'S WATERWORKS CAPACITY DEVELOPMENT STRATEGY

REPORT TO THE GOVERNOR

JULY 1, 2020 TO JUNE 30, 2023



VIRGINIA DEPARTMENT OF HEALTH

PREFACE

Pursuant to Section 1420(c)(3) of the Safe Drinking Water Act (42 U.S.C. § 300g-9 (c)(3)), the Virginia Department of Health (VDH) must submit a report to the Governor on the efficacy of VDH's Capacity Development Strategy (Strategy), including VDH's progress to improve the technical, managerial, and financial (TMF) capacity of waterworks in Virginia. The report is required to be submitted by September 30, 2023. This report was completed in its entirety by the Agency on behalf of the Secretary of Health and Human Services.

VIRGINIA DEPARTMENT OF HEALTH, OFFICE OF DRINKING WATER

Commonwealth of Virginia

Glenn Youngkin, Governor

Secretary of Health and Human Resources

John Littel, Secretary

Virginia Department of Health

Karen Shelton, MD, State Health Commissioner

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EXECUTIVE SUMMARY

Pursuant to Section 1420(c)(3) of the Safe Drinking Water Act (42 U.S.C. § 300g-9 (c)(3)), the Virginia Department of Health (VDH) must submit a report to the Governor on the efficacy of VDH's Capacity Development Strategy (Strategy), including VDH's progress to improve the technical, managerial, and financial (TMF) capacity of waterworks in Virginia. The report is required to be submitted by September 30, 2023. This report was completed in its entirety by the Agency on behalf of the Secretary of Health and Human Services. The Strategy describes VDH's work to evaluate and assist waterworks with TMF capacity. The Strategy incorporates programmatic and individualized assistance based on need. TMF capacity drives the success of a waterworks' program to comply with state and federal regulations. What follows is a report of the program for the reporting period covering July 1, 2020 through June 30, 2023.

SUMMARY OF PROGRAM ACTIVITIES FOR JULY 1, 2020 – JUNE 30, 2023

The Virginia Department of Health (VDH), Office of Drinking Water (ODW) is the primary agency for implementation of the Safe Drinking Water Act (SDWA) in the Commonwealth of Virginia. The SDWA defines a public water system, also known as a waterworks in Virginia law and regulations, as “a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year.” There are currently 2,826 waterworks in the Commonwealth of Virginia collectively serving approximately 7.8 million consumers--about 89% of the total population of Virginia (8.7 million people). The SDWA categorizes waterworks into three system types: community, nontransient non-community (NTNC), and transient non-community (TNC). Approximately 7.3 million Virginians receive water from 1,077 community waterworks that serve year-round residents. VDH regulates 503 NTNC waterworks, which provide drinking water to schools, day care centers, industrial centers, factories, and other facilities that serve at least 25 of the same persons 6 months out of the year. Finally, VDH regulates 1,246 TNC waterworks, which serve 25 or more different people for at least 60 days a year. TNCs include hotels, restaurants, campgrounds, and marinas.

In January 2022, the U.S. Environmental Protection Agency (EPA) approved Virginia's updated Capacity Development Strategy to incorporate requirements of the America's Water Infrastructure Act (AWIA). Virginia's approved Strategy has three main objectives:

1. Possess and exercise sufficient authority to prevent nonviable community and NTNC waterworks;
2. Assess, prioritize, and respond to correct TMF capacity limitations; and,
3. Ensure waterworks offered financial assistance have, or will develop, sufficient TMF capacity prior to fund disbursement.

VDH's drinking water program centers on permitting, compliance, TMF assistance, and enforcement. VDH's program identifies waterworks lacking TMF capacity, helps improve capacity, and permits the operation of regulatorily compliant waterworks. VDH requires waterworks lacking TMF capacity to complete Waterworks Business Operations Plans (WBOP) as part of Drinking Water State Revolving Fund (DWSRF) funding. A new part of the Strategy includes advancing the development of Asset Management Plans (AMP) by waterworks across the State. In addition to providing training on AMPs, VDH incorporated AMPs into construction funding agreements.

VDH issued 638 construction permits and 320 operation permits for new waterworks or modifications of existing waterworks. Staff completed 1,505 source water assessments and 59 well site inspections. VDH ensured 1,560 waterworks had a properly licensed operator. In implementing its Strategy during the reporting period (July 1, 2020 – June 30, 2023), the Capacity Development Program accomplished many programmatic goals, including the following:

- Offered a total of \$118,683,043 in construction loans to 42 waterworks through the Drinking Water State Revolving Fund.
- Awarded \$402,100 in planning and design grant funds to 12 waterworks.
- Provided \$70,302 in small project engineering assistance to four (4) waterworks.
- Completed 3,560 routine sanitary surveys of waterworks facilities.
- Conducted 130 special sanitary surveys in response to complaints or water quality issues.
- Evaluated 8,644 requests for water quality monitoring waivers for man-made chemicals.
- Issued 5,184 notices of alleged violation for noncompliance with the SDWA and Virginia Waterworks Regulations.
- Produced 186 warning letters to waterworks that were persistently in noncompliance with the regulations.
- Issued 48 administrative orders to waterworks substantially and persistently out of compliance with regulations, of which 27 were resolved from the previous reporting period.
- Responded to 54,628 requests for technical assistance from waterworks and operators.
- Evaluated 1,580 community and NTNC waterworks for TMF capacity.
- Reviewed 54 source water protection plans.

VDH's Strategy provides training to ensure managerial capacity at waterworks. VDH trains and assists waterworks owners on business operation plans. VDH has contracts with Virginia Tech to provide two classes per year on managerial capacity so that during the reporting period, they held six courses for waterworks decision makers. In 2021, VDH and Virginia Tech held two of the courses virtually because of the pandemic.

Virginia's Strategy helped waterworks reliably produce and deliver safe drinking water to consumers through direct technical assistance and regulatory compliance help. The Strategy incorporates VDH's major program activities, which maximizes capacity development in Virginia. This report documents VDH's assistance to waterworks, especially small waterworks (those serving 10,000 or fewer consumers), which tend to have the greatest need.

INTRODUCTION

CAPACITY DEVELOPMENT STRATEGY MANDATE

Pursuant to Section 1420(c)(3) of the Safe Drinking Water Act (42 U.S.C. § 300g-9 (c)(3)), the Virginia Department of Health (VDH) must submit a report to the Governor on the efficacy of VDH's Capacity Development Strategy (Strategy), including VDH's progress to improve the technical, managerial, and financial (TMF) capacity of waterworks in Virginia. The report is required to be submitted by September 30, 2023. This report was completed in its entirety by the Agency on behalf of the Secretary of Health and Human Services. The Strategy describes VDH's work to evaluate and assist waterworks with TMF capacity. The Strategy incorporates programmatic and individualized assistance based on need. TMF capacity drives the success of a waterworks' program to comply with state and federal regulations. What follows is a report of the program for the reporting period covering July 1, 2020 through June 30, 2023.

CAPACITY DEVELOPMENT STRATEGY ACTIVITIES

As the primacy agency for enforcing provisions of the Safe Drinking Water Act (SDWA) in Virginia, the Virginia Department of Health, Office of Drinking Water, maintains a robust regulatory program that ensures compliance with the SDWA. VDH's drinking water program centers on permitting, compliance, TMF assistance, and enforcement. In January 2022, the U.S. Environmental Protection Agency (EPA) approved Virginia's updated Capacity Development Strategy to incorporate requirements of the America's Water Infrastructure Act (AWIA). Virginia's approved Strategy has three main objectives:

- 1) Possess and exercise sufficient authority to prevent nonviable community and NTNC waterworks;
- 2) Assess, prioritize, and respond to correct TMF capacity limitations; and,
- 3) Ensure waterworks offered financial assistance have, or will develop, sufficient TMF capacity prior to fund disbursement.

VDH's program identifies waterworks lacking TMF capacity, helps improve capacity, and permits the operation of regulatorily compliant waterworks.

REPORT OUTLINE

The content of this report is for the period from July 1, 2020 through June 30, 2023. The report includes background of the program and Strategy, detailed programmatic information for activities relating to technical capacity, managerial, and financial capacities of regulated waterworks. It includes success stories that demonstrate the way that the program is able to effectively improve capacity at waterworks and ends with a summary of the efficacy of the Strategy.

1.0 BACKGROUND

The Safe Drinking Water Act (SDWA) defines a waterworks as “a system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year.” The capacity to operate, maintain, and sustain a waterworks successfully over a long period is comprised of Technical, Managerial, and Financial (TMF) components. TMF components demonstrate a waterworks’ ability to reliably produce and deliver safe, affordable drinking water that meets federal and state quality standards to Virginians. TMF assessments measure a waterworks’ ability to plan, achieve, and maintain compliance with the SDWA, Virginia’s Public Water Supplies law, and associated federal and state regulations.

VDH evaluates TMF of a waterworks through on-site inspections and other evaluations:

- *Technical Capacity* represents the physical infrastructure of the waterworks, including its water source, and the knowledge and skill required to operate the facility in accordance with regulations and best management practices;
- *Managerial Capacity* means the waterworks’ ability to plan, organize, and regularly achieve compliance with applicable laws and regulations that protect drinking water; and,
- *Financial Capacity* reflects the waterworks’ ability to balance revenues and expenditures, have acceptable loan ratios, and to maintain overall healthy financial data.

The TMF elements are interdependent--all three are essential for ensuring the sustainability of a waterworks. Weakness in one area of capacity will impair other components. For example, a waterworks that lacks financial capacity might have inadequate service rates, which affects the waterworks’ ability to hire qualified and licensed staff, to plan and implement necessary repairs and maintenance, and to manage the waterworks effectively.

There are currently 2,826 waterworks in the Commonwealth of Virginia collectively serving approximately 7.8 million consumers (roughly 89% of the Commonwealth’s total population of 8.7 million people). Most Virginians receive water from community waterworks, which have at least 15 service connections with year-round residents, or that regularly serve at least 25 year-round residents. Community waterworks include systems serving hundreds of thousands of consumers, small towns, and individual neighborhoods. Nontransient non-community (NTNC) waterworks serve at least 25 of the same persons over six months out of a year. Examples of NTNCs include schools, hospitals, or manufacturing plants. Transient non-community (TNC) waterworks serve at least 25 persons daily for at least 60 days out of the year. Examples include restaurants, campgrounds, and hotels. Figure 1 shows the composition and population served by each classification.

VDH has well-established procedures to address TMF through routine interactions, inspections, and the new Sampling Verification Program. VDH’s sanitary survey program evaluates the condition of a waterworks’ infrastructure, operational practices, and drinking water quality indicators. VDH can identify TMF strength and weakness at the waterworks through its routine business process. Staff provides waterworks with ongoing, daily help with TMF.

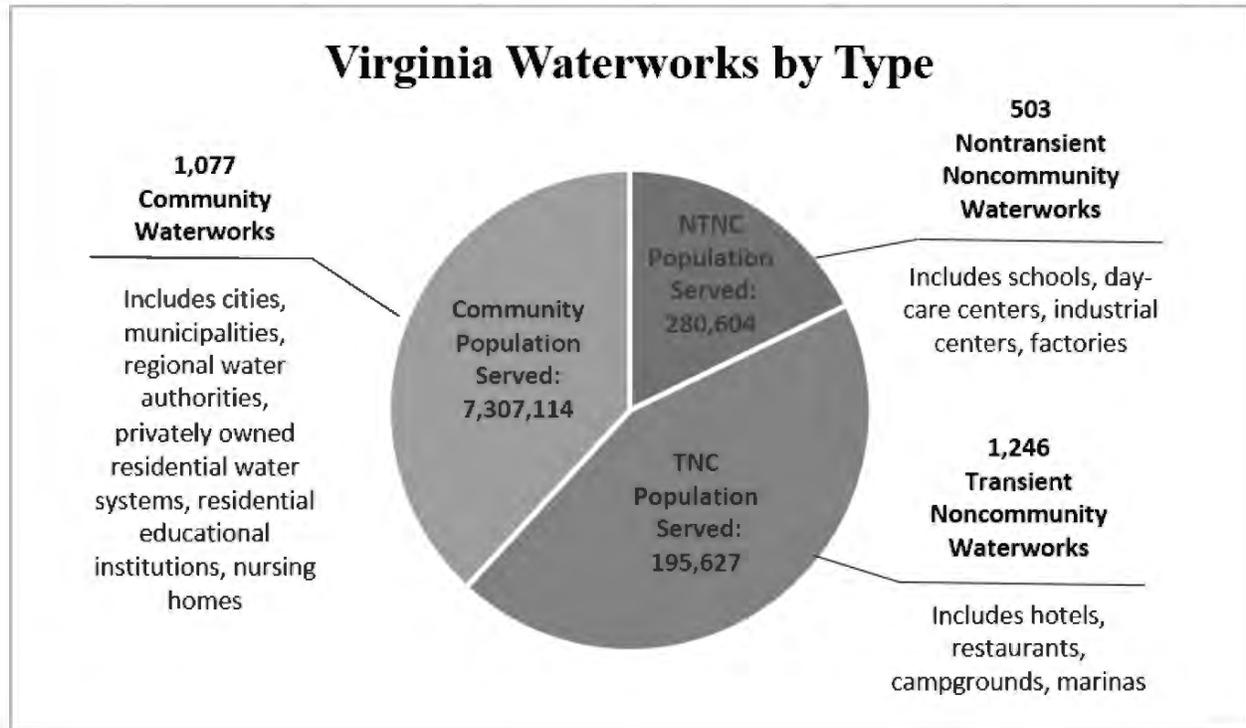


Figure 1: Virginia Waterworks by Type

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2.0 TECHNICAL CAPACITY

Technical capacity encompasses the physical infrastructure of a waterworks, including water source, treatment facility, and distribution system. Equally important are the knowledge, skills, best management practices, and training required to operate the facility in accordance with regulations. Technical capacity includes the permits and regulations that establish operational requirements. Described below are VDH-specific operational areas that provide support to waterworks.

2.1 CONSTRUCTION PLANS AND PERMIT REVIEW

VDH issued 638 Construction Permits and 320 new and amended Waterworks Operation Permits from July 1, 2020, to June 30, 2023. Applicants document TMF in the process of securing a permit from VDH. Virginia Code §§ 32.1-172, and the Virginia Waterworks Regulations, at 12VAC5-590-190, prohibit the establishment, construction, or operation of a waterworks without a written permit. Hence, TMF is a part of every application. The construction and operation permit requirements ensure that waterworks have TMF sustainability before operating the waterworks. A waterworks owner must complete a five-step application process before receiving a permit. The application process includes:

- Notification of Intent (Permit Application),
- Preliminary Engineering Conference,
- Submission of a Waterworks Business Operations Plan,
- Submission of a Preliminary Engineering Report, and
- Submission of Final Plans and Specifications.

After installation and construction of the plans, a professional engineer must certify that the final construction complied with approved plans and specifications. Upon receipt of the engineer's completion statement, VDH will issue an Operation Permit, which also establishes operator licensure and other operating requirements. The above procedures ensure that a new waterworks is properly designed, constructed, and inspected, and has sufficient TMF with licensed operators on staff. VDH procedures compel prospective waterworks owners to plan for long-term financial sustainability.

Beginning in 2023, VDH implemented a centralized program to review final plans and specifications and issue construction permits. This allowed VDH to improve customer service by providing more consistent project reviews and decreasing permitting time from an average of 72 days in 2022 to 29 days in 2023 under the centralized program.

2.2 SANITARY SURVEY PROGRAM / ON-SITE INSPECTIONS

VDH staff perform on-site inspections of waterworks through the sanitary survey program. Inspections include evaluations of the waterworks' infrastructure and water treatment processes, a review of drinking water quality monitoring records, and an examination of the operational practices and controls. VDH also reviews waterworks' staff qualifications.

During a sanitary survey, if VDH staff identify "Significant Deficiencies," they develop a "Corrective Action Plan" for these deficiencies. Significant Deficiencies are defects that cause or have the potential to cause an unacceptable risk to health or that could affect the reliable delivery of safe drinking water. Corrective Action Plans are designed to resolve Significant Deficiencies by a specific date. During the reporting period, 13 waterworks received Significant Deficiencies in the context of sanitary surveys.

VDH staff also conduct special inspections of waterworks to evaluate new construction, investigate consumer complaints, and respond to specific requests for assistance. Staff also make site visits to perform

source water assessments and to evaluate locations of proposed new wells. These visits provide VDH with opportunities for direct, face-to-face interaction with waterworks owners and operators and allow guidance for TMF capacity improvement.

Through the sanitary survey program, staff identify waterworks’ capacity needs, and prioritize and target waterworks for additional guidance and assistance. VDH staff document sanitary surveys through a written report that also serves as an action plan for waterworks owners to correct deficiencies and improve operations.

Staff transitioned to using an electronic sanitary survey platform to reduce survey reporting time, increase consistency, and allow for analysis of statewide sanitary survey data to reveal trends.

Figure 2 summarizes VDH field activities in the current and previous reporting periods, offering trends over time for the number of sanitary surveys and groundwater assessments.

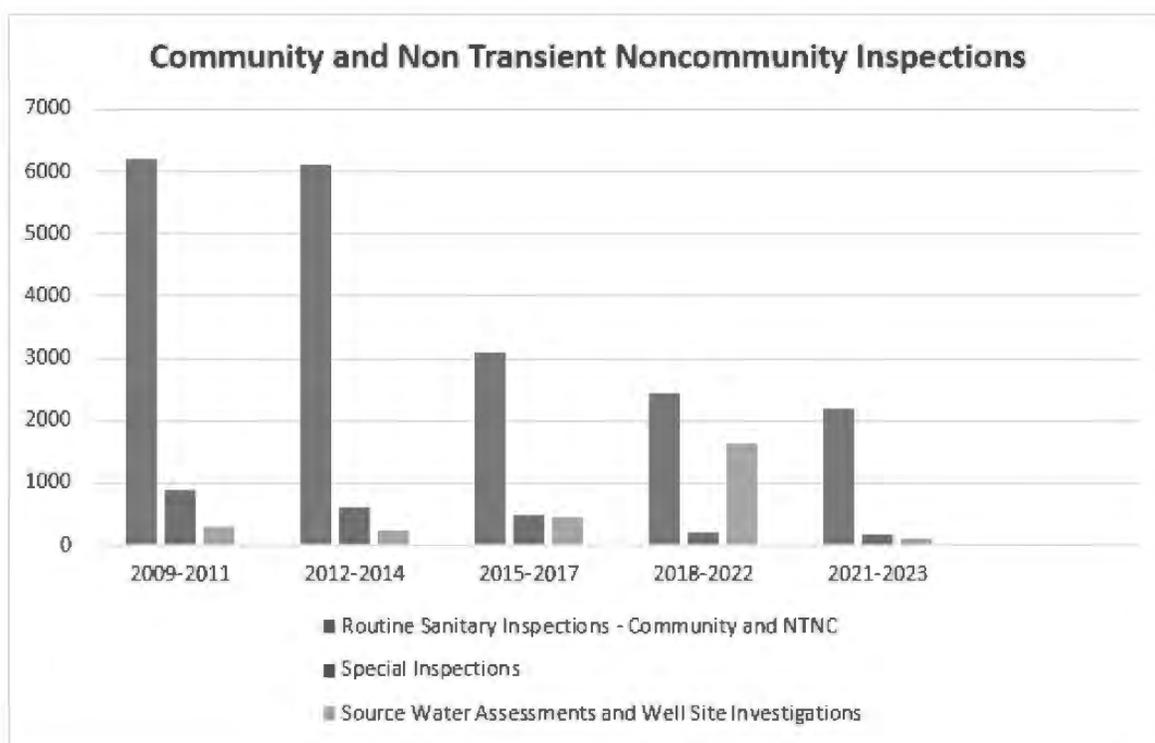


Figure 2: Community and Non-transient Noncommunity Inspections

During this reporting period, VDH staff performed 2,179 routine sanitary surveys at community and NTNC waterworks, 54 special sanitary surveys (including inspection of new construction, complaint investigations requiring field visits, and delivery of on-site assistance), and 134 well site inspections.

Source water assessments use GIS tools and other database records to identify sources of contamination and provide insights on protecting the water supply. Staff occasionally require field verification of contamination sources with the permitting or sanitary survey processes.

The SDWA requires inspection of community waterworks a minimum of once every three years and noncommunity waterworks a minimum of once every five years. In prior reporting periods, VDH conducted more frequent routine and special sanitary inspections. Beginning in 2022, VDH modified its inspection

frequency to align with the minimum inspection frequency established by the SDWA and the Waterworks Regulations due to a lack of manpower. The adjustment allowed staff to onboard new, previously unregulated TNC waterworks and to spend more time at each inspection. In other words, VDH now inspects more systems, in more detail, less frequently. This trend is likely to continue as laws and regulations expand to cover more contaminants and facilities and ODW's funding remains flat. ODW did not receive additional funding or full-time employees to handle the additional workload, which is why inspection frequencies decreased over time.

Due to workload issues and budget considerations, EPA conducted a Workload Analysis of the Office of Drinking Water in 2022 and issued its findings in 2023. The final report indicates that even with a reduction in frequency of sanitary surveys, the independent EPA consulting firm, Cadmus identified that ODW requires an additional \$9.4 million in funding and an additional 42 Full Time Employees (FTEs) to keep pace with the Safe Drinking Water Act and all the new rules that have been promulgated and will be issued soon. These rules include but are not limited to: Lead and Copper Rule Revisions, Lead and Copper Rule Improvements, PFAS Rule, Consumer Confidence Rule (CCR) revisions, and revisions to the microbial and disinfection byproducts rules (MDBPRs).

Also, VDH now regulates hundreds more TNCs than prior to 2015. VDH also increased attention to source water assessments. The next section provides details on work with TNCs.

2.3 TRANSIENT NONCOMMUNITY INSPECTIONS

The Commonwealth of Virginia has 35 health districts and a local health department (LHD) in 95 counties and 38 independent cities. The LHD issues permits for restaurants, food service facilities, campgrounds, hotels, migrant labor camps, and other businesses. The LHD forwards copies of permits for commercial establishments to the regional Office of Drinking Water. If a business meets the definition of a waterworks, then ODW will help the applicant with permitting and TMF. Hence, a business could have multiple permits from VDH, one for the food establishment, one for the hotel/motel/campground/marina, one for the sewage system, and another permit for the drinking water supply.

ODW works with the LHD to ensure all businesses have proper permits for drinking water. Many times, the water quality and production are ancillary to the business. The business owner may treat the water supply as a lower priority as compared to the primary business operation (e.g., serving food, manufacturing, etc.). TNCs often lack TMF capacity. Compliance with the Virginia Waterworks Regulations can be challenging, which is why VDH created and hired a specific position in 2019 to focus on these waterworks. The Noncommunity Sustainability Coordinator works directly with TNC owners and operators to enhance understanding of TMF responsibilities and requirements. Staff develop training and outreach materials, provide technical assistance on compliance with regulations, including sampling frequency, and evaluate policy and procedures to improve compliance and sustainability. The Noncommunity Coordinator developed a "Welcome Packet" for TNCs to orient them to their responsibilities as a regulated waterworks and provided resources, including a sampling video. VDH performed 1,381 sanitary surveys at TNC facilities during the reporting period.

2.4 SOURCE WATER ASSESSMENT AND SOURCE WATER PROTECTION

Beginning in April 2003, VDH started an EPA-required effort to perform source water assessment susceptibility rankings for all active public water supplies. EPA and VDH designed the assessments to reveal potential vulnerabilities from manmade sources of contamination. The assessments help with water supply planning, source water protection, and managerial capabilities. VDH performs assessments on new water supplies and records conditions found from field observations and sanitary surveys. During the reporting period, VDH generated updated Source Water Assessment Program (SWAP) reports for 3,942 sources and made them available to staff. VDH delivered new or updated SWAP reports for 360 sources. VDH generated

and delivered 558 Preliminary SWAP reports for new or proposed sources. Performance metrics track assessments completed and waterworks that need an assessment.

In July 2003, VDH created a Wellhead Protection Plan program for small community groundwater systems, which VDH continues to implement. In 2021 the program title changed to “Source Water Protection Grant program” which now includes projects that involve surface water. VDH requires a qualified consultant to assist in plan development. The program helps waterworks with a high contamination susceptibility to develop a wellhead protection plan. Waterworks serving less than 50,000 persons receive technical support from a qualified contractor. The resulting protection plans ensure the participating waterworks safeguard drinking water sources by managing and controlling activities near the source, which could compromise water quality and quantity. Staff expanded the program from groundwater systems with 10,000 or less persons to waterworks that use surface water and serve less than 50,000 persons. Approximately 18 small waterworks prepare site-specific Source Water Protection Plans (SWPPs) each year. Program contractors contact an average of 195 waterworks to determine interest. In this reporting period, contractors made four program presentations at local advisory committee meetings.

During this reporting period, waterworks and their consultants completed 54 SWPPs, facilitated 15 local advisory committee meetings, drafted 23 more SWPPs (waiting on approval by the waterworks’ management), and offered assistance to an average of 960 waterworks per year.

2.5 ON-SITE ASSISTANCE AND OUTREACH TO OPERATORS AND OWNERS

Owners and operators of small waterworks have difficulty finding the time and financial resources to attend formal classroom-style training events. VDH encourages staff to provide in-field training during inspections and other in-person visits. Staff answer questions and provide guidance on regulations, technical topics, and best management practices. Staff handle technical assistance informally during sanitary surveys, through telephone conversations, or by emails. Technical assistance represents a cornerstone of the ODW program and includes sharing information and expertise, answering questions, providing instruction or training, conveying working knowledge, and transferring technical data. Staff also assists waterworks with the development of WBOPs and Asset Management Plans. Effective relationships developed over time ensure community partners, customers, and the regulated community receive the most up-to-date information available.

In June of 2021, the Office of the State Inspector General (OSIG) presented ODW with the results of an extensive audit of the Drinking Water Regulation Program. The audit highlighted specific challenges ODW faced in accurately and effectively gauging sampling protocol, procedures, and technical and analytical compliance at waterworks. This issue was attributed to the lack of supervision in the sampling process. The audit discovered the existing regulatory framework for compliance and enforcement measures was not optimally utilized or uniformly carried out across all field offices to address concerns at the waterworks. Consequently, the implementation of the Sampling Verification Program was initiated to address the audit's findings and enhance the supervision of the waterworks. A total of 7 full-time employees have been recruited for the program: a Data Analyst-Program Manager reporting to the central office and 6 Sampling Technical Specialists reporting to each of the Field offices. With the aid of these 7 positions, ODW will be able to effectively reach all corners of Virginia to address the concerns OSIG presented. The program is currently completing Phase 1 which entailed foundational work, training, data analysis, and metrics determination to assess the program's current state and setting clear, measurable future goals. Phase 2 will begin in late 2023 and will include procurement of services of a certified environmental laboratory that will analyze samples collected through targeted field sampling audits. This program has been thoughtfully engineered to meet all the mandatory regulations set by the Environmental Protection Agency and the Commonwealth of Virginia, ensuring a sustainable and long-lasting solution that guarantees safe and clean drinking water.

2.6 ASSISTANCE CONTACTS BY VDH STAFF

VDH staff interact with waterworks owners and operators through a variety of informal contacts including meetings, telephone calls, and emails. Staff give assistance that covers a full range of TMF capacity concerns. For instance, staff may help to address drinking water quality sampling needs, follow-up on corrective measures described in a sanitary survey report, or review and assist with the preparation of an annual Consumer Confidence Report. Staff inform waterworks operators of upcoming training opportunities or offer help with water treatment dosage calculations. Staff can advise owners of potential impacts from, or requirements of, pending state or federal regulations. During the reporting period, VDH staff received and responded to 54,628 technical assistance requests from waterworks owners and operators.

2.7 VULNERABILITY ASSESSMENTS AND MONITORING FOR PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Waterworks owners must collect water samples to test for regulated contaminants. For some man-made chemical contaminants, waterworks may forgo routine water quality monitoring when the drinking water source is located and constructed to eliminate susceptibility to the contaminants. The source water cannot be vulnerable to contamination because there is no use of the chemicals near the source. A waterworks owner may request a waiver from regulation of certain contaminants in these situations. The waiver application process requires the waterworks owner to conduct a self-assessment of the source water's susceptibility and vulnerability to contamination. VDH screens the waterworks for conditions that may impair source water quality. The waiver process encourages TMF capacity by highlighting beneficial planning efforts that the owner can implement through programs, such as wellhead and surface water protection plans. VDH staff reviewed and assessed 826 applications for monitoring waivers from eligible waterworks during the reporting period.

The General Assembly mandated in Chapters 611 and 1097 of the 2020 Acts of Assembly that VDH act on PFAS to help local communities address per- and polyfluoroalkyl substances (PFAS) and protect public health. In response to Chapters 611 and 1097, during 2021, VDH sampled source water and drinking water at waterworks using sources at increased risk from PFAS impact and based on waterworks size. The sampling included 45 waterworks and 63 sample locations. Samples from 48 of the 63 sample locations did not contain any PFAS above the practical quantification level (PQL). Samples from 15 sample locations showed at least one PFAS above the PQL. As a result of the sampling, certain waterworks with PFAS detections initiated actions to address PFAS levels. VDH published summary reports of the sample results on the agency website.

During 2022 and continuing through 2023, VDH has sampled drinking water at over 200 sample locations, targeting small waterworks, and waterworks using surface water and groundwater under the direct influence of surface water. After completion of the sampling effort and a detailed quality assessment/quality assurance review of the laboratory results, VDH will publish a summary of the sample results by November 2023.

2.8 WATER LOSS AND EVALUATION ASSISTANCE

VDH continues to support assistance to waterworks experiencing water loss and leakage in distribution systems. Staff continue to request water loss information from DWSRF applicants and planning grant applicants. Staff discuss water loss and unbilled water during sanitary surveys and when issuing operation reports. This effort has improved understanding about the number of waterworks experiencing significant water loss and the potential need for assistance to small waterworks. VDH has partnered with both the Virginia Rural Water Association (VRWA) and the Southeast Rural Community Assistance Project (SERCAP) through funding of set-aside suggestions for the purchase of leak detection equipment. Both organizations continue to actively use the equipment to assist waterworks in leak detection and line location. VDH can refer waterworks to these organizations that provide services at no charge to the referred waterworks. In 2022, the Virginia Department of Environmental Quality (VDEQ) requested that ODW speak to the June Water Audit Regulatory Advisory Panel (RAP). VDEQ was working to develop amendments to the groundwater and

surface water withdrawal regulations requiring water audit and leak detection plans as permit conditions. The presentation to the Water Audit RAP members discussed ODW's capacity building efforts with waterworks. ODW also addressed incentives for the reduction and elimination of water loss and the VDH – ODW regulations on water loss. The group discussed the AWWA Water Audit Method M-36 as part of the presentation.

2.9 ASSET MANAGEMENT PLANNING

Asset management planning is an important part of long-term prioritization of the maintenance, repair, improvement, and sustainability of waterworks. This is reflected in America's Water Infrastructure Act of 2018 (AWIA) Section 2012, which amended the SDWA to require Virginia to amend its Capacity Development Strategy (Strategy). The revised Strategy describes how Virginia encourages the development and use of Asset Management Plans (AMPs). VDH staff revised the Strategy, submitted it to EPA, and EPA approved the revised strategy in January 2022.

VDH annually provides training to waterworks through a variety of courses. This core component of the two management-focused courses is integrated into the annual Short School for Drinking Water Utilities. VDH also provides funding mechanisms for waterworks to develop AMPs that include five core components: (1) Asset Inventory, (2) Life Cycle Costs, (3) Level of Service, (4) Criticality, and (5) Long-term Funding. VDH can fund AMPs through the Planning and Design Fund Program, the Small Project Engineering Program, and as an additional engineering cost associated with a DWSRF-funded construction project. VDH requires an AMP as part of a DWSRF project when a waterworks does not already have a current plan or has not updated it within the last 5 years. To encourage asset management planning, VDH will make available the lesser of the actual cost of an AMP or \$15,000 as principal forgiveness when requested as part of a construction funding offer. With the use of electronic sanitary surveys, VDH can document whether a waterworks self-reports having an AMP.

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3.0 MANAGERIAL CAPACITY

Managerial capacity is a waterworks' ability to plan and organize essential business activities in order to achieve compliance with applicable laws and regulations. This is where a waterworks owner must make decisions that affect overall technical and financial capacities. A strong managerial capacity will achieve results even when the other capacities may be less robust.

3.1 DATA COLLECTION AND ANALYSIS

VDH maintains and uses the Safe Drinking Water Information System (SDWIS), which is an extensive electronic inventory of waterworks facilities, personnel, sampling data, and compliance status. SDWIS is the primary vehicle for VDH to report required information to EPA. VDH has transitioned away from older relational Access databases to a new suite of tools, developed by a private vendor, to access waterworks records, inspection schedules, sample results, and compliance issues. This proprietary suite of software accesses the data stored in SDWIS and provides it to staff in a more user-friendly way. Data is also provided to the public through an outward-facing website to allow the public access to information about regulated waterworks. Staff use associated electronic tracking tools for application and plan review activities. Use of these electronic tools facilitates interaction with waterworks and provides a quick way to assess many elements related to waterworks TMF capabilities.

In early 2023, VDH conducted a required triennial assessment of all community and nontransient noncommunity waterworks in Virginia. The assessment consisted of 18 “yes” or “no” questions, which were related to the three TMF capacities. VDH staff used official records to answer questions and directly contacted waterworks for additional information as needed. Staff compared results of this assessment to both the 2016 (baseline) and 2020 assessments. Technical questions explored whether the waterworks had sufficient operator coverage for sick leave and vacation as well as asking whether the facility addressed recommendations from recent sanitary surveys. Managerial questions included asking whether the waterworks facilities and appurtenances were in good operating condition and whether the waterworks met all established National Drinking Water Standards. Financial questions included asking whether the waterworks had at least 45 days cash on-hand to cover expenses and whether the waterworks had adjusted rates in the past three years.

If staff were unable to get a response to a particular question, then staff answered that question “No” per the process instructions. Appendix 1 has the complete list of questions asked during the triennial assessment. VDH incorporated the Triennial Assessment questions into the electronic sanitary survey in 2022 but the data was not complete enough to use as the sole source of data for the evaluation. This is an area that VDH will continue to work on.

Staff evaluated 1,576 systems, 1,078 were community waterworks and 498 were NTNC waterworks. The maximum score possible was 18. Waterworks scoring 10 or lower tend to demonstrate substantial lack of TMF capacity and operational challenges. Overall, the average score of all waterworks surveyed was 14. The average score of all community waterworks was slightly higher at 15 and the average score of all non-transient noncommunity waterworks was lower at 13. This is consistent with how the groups performed in the previous assessment.

Composite data for 2023 is shown in Figure 3. Data from 2016, which serves as the baseline, and 2020 are in Figure 4. In 2020, unlike in 2016, there was not a pronounced jump between scores of 9 and 10 but instead there was a general right-trending curve with a diminished peak at 11 points and another at 17 points. The upward trend in the data continued with the 2023 evaluation with the curve trending more to the right and with more waterworks falling into the upper ranges. Data from the three Triennial Assessments shows a decrease from year to year of the percent of waterworks scoring 0-9 and 10-15 points and an increase of waterworks

scoring 16-18 points. This indicates an increase in overall TMF capacity at waterworks and a positive impact from capacity-building measures VDH implemented through the Strategy in the past six years.

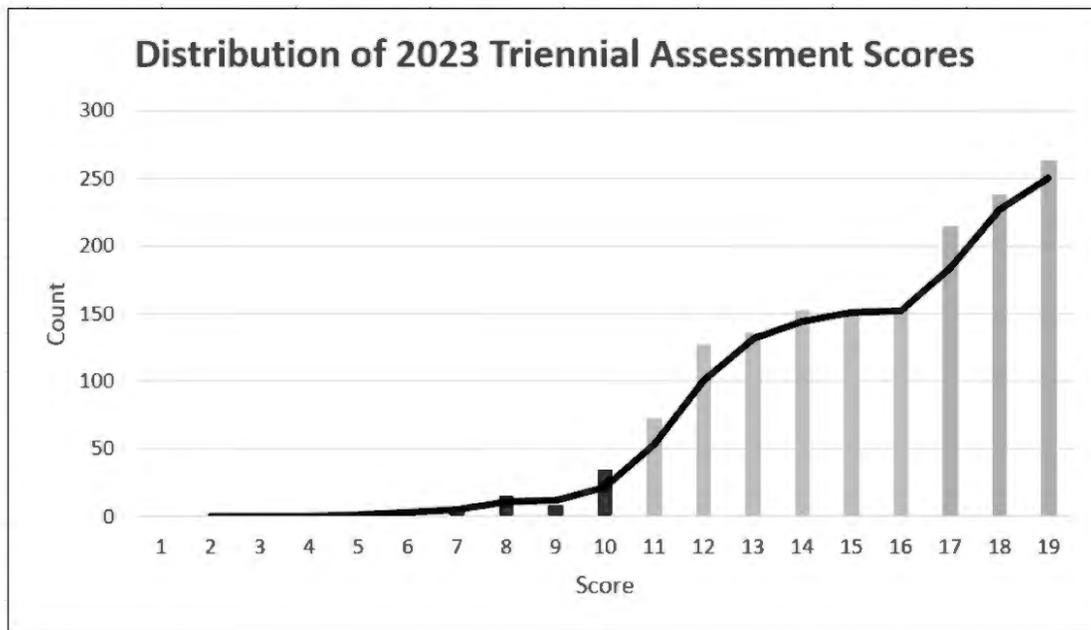


Figure 3: Distribution of 2023 Triennial Assessment Scores (Community and NTNC)

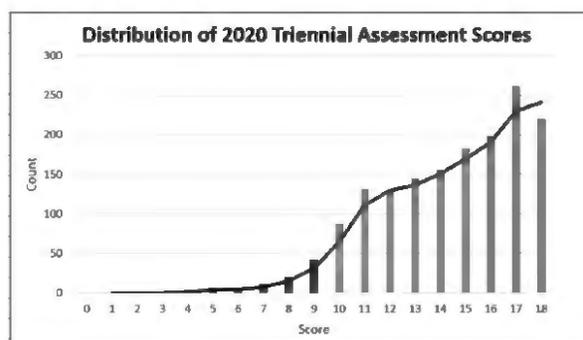
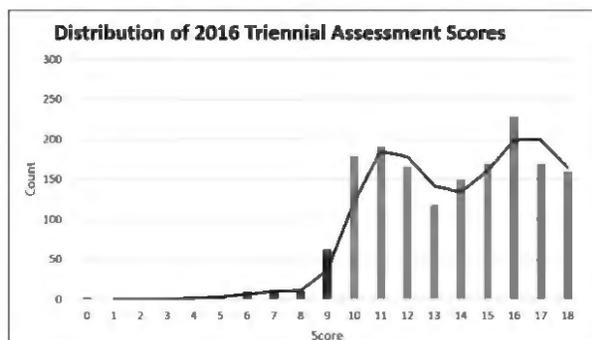


Figure 4: Distribution of 2016 (Baseline) and 2020 Triennial Assessment Scores (Community and NTNC)

The lowest score reported in 2023 was 4 points; two waterworks fell into this lowest bin, which were located in Southeast Virginia. Both waterworks received direct technical assistance from VDH staff and from technical assistance providers.

In prior years, the area generally identified as “Southside” received the lowest scores. In the 2023 evaluation, the distribution of low scores is more spread out and encompasses the middle section of the state from the western state line around Highland County, down through Southside, and into the Virginia Beach area. Southwest Virginia had the best performing systems because that area received substantial infrastructure funding over the past 20 years. Additionally, waterworks training opportunities are generally focused in Blacksburg and Roanoke. VDH recognizes the “success” formula and is making plans to expand upon the success learned working with Southwest Virginia to other parts of the Commonwealth.

VDH will prioritize training, funding workshops, technical assistance, and financial resources in the middle portion of Virginia to address shifting trends. Staff will reach out to Planning District Commissions (PDCs) to increase funding opportunity awareness. During the reporting period, staff collaborated with PDCs to hold funding workshops with multiple drinking water funding partners. Additionally, the DWSRF program has dedicated a project manager for each of the field office service areas to better serve the needs of waterworks across Virginia.

A review of statewide responses for the triennial assessment provides other insights. The following questions generated the lowest scores, with less than 50% of all waterworks meeting the criteria:

- Question 5: Does the waterworks have a written policy for responding to customer complaints? (49%, up from 45% in 2020)
- Question 17: Has the waterworks adjusted rates in the past three years? (50%, no change from 2020)
- Question 18: Does the waterworks have an Asset Management Plan? (52%, up from 49% in 2020)

VDH has addressed these areas following the previous Triennial Assessment in 2020. Since then, there has been an improvement in areas of written customer complaints (2% increase), and waterworks with an Asset Management Plan (3% increase). There was no discernable change in the percent of waterworks that have adjusted rates, perhaps because of COVID-19 response and making sure water was affordable during the pandemic. Of note, complaint response, asset management planning, and water rates are not regulated, but serve as a best practice for long term viability of waterworks. VDH continues to train and assist waterworks with completing Asset Management Plans and a current Asset Management Plan is a requirement for waterworks receiving funds under the Drinking Water State Revolving Fund (see section 3.9 above).

3.2 COMPLIANCE AND ENFORCEMENT PROGRAM

VDH routinely reviews water quality data submitted by waterworks, and issues Notices of Alleged Violation (NOAVs) for sample results that do not appear to meet the Virginia Waterworks Regulations. VDH may also issue NOAVs for the failure to monitor and report water quality results, the failure to employ licensed operators, recordkeeping violations, and other conditions that deviate from the regulatory requirements. The SDWA, the National Primary Drinking Water Regulations, and the Virginia Waterworks Regulations establish standards. During the reporting period, VDH issued approximately 5,184 NOAVs to waterworks; approximately 3,908 or 75.4% of those were for monitoring violations, typically associated with a waterworks' failure to collect and analyze required water quality samples. Staff enter violations into the SDWIS database where the system tracks and can generate reports.

VDH uses EPA's Enforcement Response Policy and its associated Enforcement Targeting Tool (ETT) to identify waterworks with violations of significant noncompliance. VDH focuses on waterworks with health-based violations and those that show a history of violations across multiple rules. EPA compiles data for the ETT quarterly report from the NOAVs that VDH issues and records in SDWIS.

The ETT identifies waterworks with the highest total noncompliance across all rules, within a designated time. The ETT formula places a higher weight on health-based violations, including treatment technique and maximum contaminant level violations. The formula calculates a score for each waterworks based on unresolved violations and violations that have occurred over the past five years. Scores do not include violations that have returned to compliance or are on a "path to compliance" through a specified enforceable action. VDH uses the quarterly ETT report to prioritize staff assistance to waterworks with numerous or serious compliance issues. The ETT can also help identify waterworks that are in danger of becoming priority systems.

EPA generates the ETT quarterly report based on SDWIS/State data. EPA considers waterworks with ETT scores greater than 10 a "serious violator;" waterworks with ETT scores of 5-10 are considered "potential serious violators;" and the approach to waterworks with an ETT score less than five is discretionary. Figure 5

shows the number of systems with an ETT score greater than 10 for each quarter of the July 1, 2020 - June 30, 2023, reporting period, which represents less than 1.0% of all waterworks in the Commonwealth.

VDH has moved away from a centralized approach of enforcement actions to a more decentralized approach that enables field offices to return waterworks to compliance expeditiously. Field offices, each with one Compliance Specialist, take the lead on formal enforcement actions, such as issuing consent orders and monitoring cases for compliance. The Compliance Specialists work closely with the ODW Division of Compliance, Enforcement and Policy for legal advice, enforcement strategy, fairness, and consistency. Since implementing this collaborative approach, the number of waterworks on the ETT list has decreased generally over time. The Division provides real-time compliance information to the field offices, evaluates enforcement priorities, as well as ensures consistent enforcement approach and collaborative strategies with various assistance programs. VDH adopted a new Enforcement Manual in October 2020, and is revising it to provide further clarity, direction, and uniformity to the compliance and enforcement program.

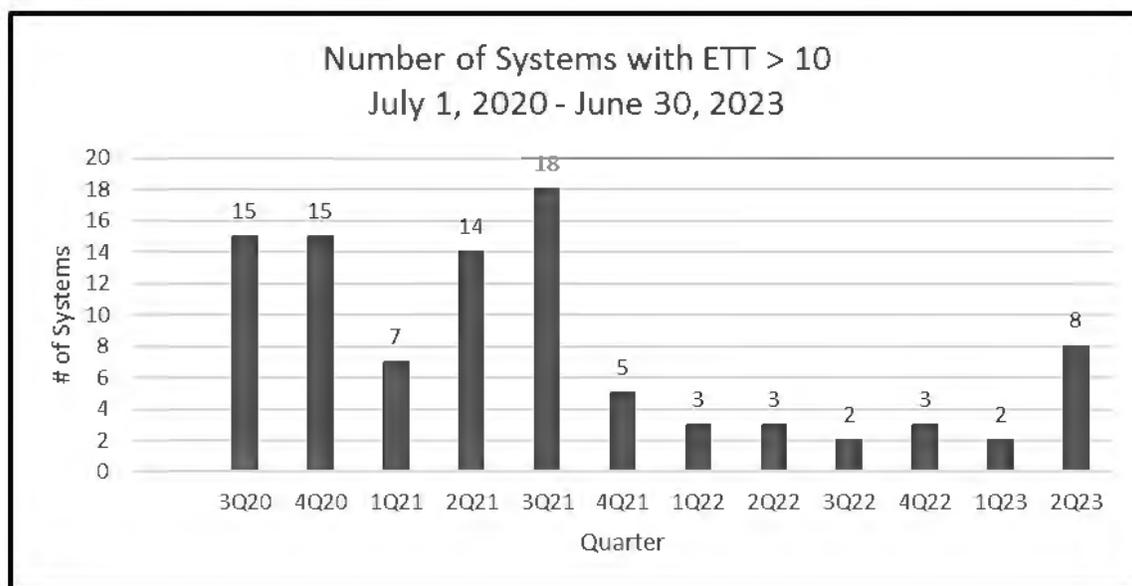


Figure 5: Number of Systems with ETT>10, July 1, 2020 - June 30, 2023

VDH also uses the ETT as a guide for the issuance of warning letters to encourage waterworks owners to take actions necessary to return to compliance. Warning letters summarize the waterworks’ violations, corrective action deadlines, and consequences for failure to act. VDH issued 186 warning letters to noncompliant waterworks during the July 1, 2020 - June 30, 2023, reporting period.

The ETT helps direct staff actions to encourage and require compliance with applicable laws and regulations. VDH uses administrative consent orders and special orders to enforce the regulations that protect public health. The State Health Commissioner has authority to issue binding, bilateral consent orders and unilateral special orders to waterworks owners who have violated the Virginia Waterworks Regulations. As required by Virginia law, VDH conducts hearings to provide parties due process before issuing adverse decisions that could result in a unilateral special order. Both orders set timelines to compel corrective measures. During the reporting period, the Health Commissioner issued 48 administrative orders to bring waterworks into compliance and 27 waterworks resolved the terms of the orders, concluding the enforcement action.

VDH’s enforcement approach is highly focused on identifying solutions to the underlying causes of waterworks’ noncompliance with state and federal drinking water regulations. VDH uses various tools to direct attention and provide guidance to waterworks owners on ways to correct deficits in TMF capabilities. For instance, during an administrative enforcement hearing, staff may determine that inadequate revenues are the

ultimate cause of the waterworks' chronic monitoring failures. Staff may ask the waterworks to submit a WBOP as a budgeting tool or give assistance with rate setting to address the lack of financial capacity.

Noncompliance with the regulations reflects on the effectiveness of the Capacity Development Strategy. Tracking and addressing compliance failures help staff learn what activities, grant awards, and metrics are the most effective. Staff must continue to improve and develop methods to assist priority waterworks on the ETT. Staff are developing metrics to assess the Capacity Development Strategy.

3.3 WATERWORKS CLASSIFICATION AND OPERATOR LICENSURE

The Virginia Waterworks Regulations classify waterworks from Class 6 to Class 1 based on the population served, source, and operational complexity. Regulations require each community and NTNC waterworks to have a licensed operator of equal or higher classification as their waterworks. This person can be a member of staff or otherwise contracted. In June 2023, a licensed operator is required at 1,580 community and NTNC systems. VDH encourages small waterworks with TMF capacity deficiencies to connect to a larger municipal water distribution system or service authority when possible. ODW amended the *Waterworks Regulations*, effective June 2021, addressing, among other things, classification of waterworks, operator requirements and operator attendance. These requirements, for the most part, implemented requirements in ODW's policy documents, and ensured uniform implementation of operator requirements across Virginia.

As of January 1, 2017, the Virginia Department of Professional and Occupational Regulation (DPOR) adopted the Association of Boards of Certification (ABC) national examination requirements. DPOR regulates licensure of waterworks operators in the Commonwealth. Operators must have applicable experience and education. DPOR requirements include passing an examination of the minimum required knowledge, skills, and abilities to receive a license. Requirements limit experience credits to the operation and maintenance of water distribution systems, laboratory work, and treatment plant maintenance. Minimum experience requirements depend on the operator classification: less experience is required for Class 6 compared to Class 1. The minimum educational requirement for a Virginia operator's license is a high school diploma or General Educational Development certificate. Candidates without a high school diploma may get a license by substituting more operator-in-training experience for education.

During the reporting period, the number of licensed waterworks operators decreased from 2,099 in June 2020 to 1,909 in June 2023. Staff attribute this decrease to an aging workforce with operators retiring. To address this trend, VDH continues to offer low-cost education solutions to increase operators' knowledge, skills, and abilities. In 2023, VDH collaborated with Virginia Tech and DPOR to provide proctored licensure tests on site at the end of the annual Water Operator Short School. A total of 44 individuals qualified for and sat for the pen-and-paper test; results are pending.

3.4 EMERGENCY PREPAREDNESS

Virginia is vulnerable to many natural and man-made hazards. Waterworks owners must prepare for, respond to, and recover from tornados, hurricanes, winter storms, earthquakes, floods, terrorism, and vandalism to name a few potential threats. VDH provides a variety of all-hazards training, exercises, and planning tools to assist with waterworks preparedness. VDH assists waterworks during incidents and emergencies by serving as the lead agency of Emergency Support Function 3 at the Virginia Emergency Operations Center. VDH staff also provides technical assistance during the recovery stages of incidents and emergencies.

VDH staff prepares waterworks owners for hurricanes and winter weather by offering preparedness materials to community waterworks during the Governor's proclamation of Winter Preparedness Week and at the beginning of hurricane season (June 1 – November 30). Preparedness materials are also available on the VDH website and include information for the issuance of boil water advisories, VDH after-hours emergency

contact information, pre-incident preparedness planning, incident response planning, well disinfection procedures, information for generators, and backup power needs. VDH provides contact information for other organizations and agencies that assist with incident planning and response, such as the Virginia Water/Wastewater Agency Response Network (VA-WARN).

Extended power outages resulting from hurricanes, severe weather and winter storms can pose technical and financial challenges. The Virginia Waterworks Regulations require that waterworks have an Emergency Management Plan (EMP) for extended power outages. About 27% of community waterworks have emergency power available for the entire waterworks. The drinking water industry and VDH need to improve outreach and training to achieve sustainable and resilient practices.

During the reporting period, ODW Emergency Preparedness and Security personnel participated in exercises to test emergency response capabilities: the Potomac Spill Functional Exercise simulating a spill on the Potomac River, the Virginia Operational Exercise simulating a nuclear incident, the Virginia Emergency Support Team Exercise simulating a cyberattack affecting the power grid, and the Occoquan Reservoir Spill Functional Exercise simulating a spill into the Occoquan Reservoir. ODW also presented at training webinars, discussing topics such as safety, continuity of operations, and emergency response planning. ODW helped EPA's Water Security Division prepare to host emergency response plan exercises with Virginia waterworks and did the research and preparation necessary to incorporate cybersecurity into sanitary surveys. Personnel also assisted waterworks in response to and recovery from harmful algal blooms in source water supplies, natural disasters from severe weather events including flooding and extended power outages, and a chemical spill that could have impacted a town's water source. Staff also worked closely with the regulated community to address health and safety concerns from COVID, staffing shortages, and supply chain issues.

3.5 CONTINUING PROFESSIONAL EDUCATION

VDH facilitates TMF competencies for waterworks staff through on-going training. Curricula include technical topics such as equipment operation and maintenance, drinking water chemistry and microbiology, water treatment technologies, and operator math. Sessions address managerial aspects of waterworks operation through instruction and training on the Virginia *Waterworks Regulations*, capacity development, financial planning, asset management, waterworks administration, and waterworks security.

The Water Operators Short School is the preeminent water and wastewater operator training in Virginia. VDH actively participates in the Short School by volunteering as course instructors. This annual training at Virginia Tech is a weeklong course held annually since the 1940s. There have been three levels to the course: introductory, intermediate, and advanced. Each level provides approximately 15 classes and focuses on a variety of waterworks operations topics and each level includes at least one session on Asset Management Planning. The curricula for the intermediate and advanced courses build on the preceding year's course. There was an effort to create a fourth level targeted at management. Those classes would have included asset management, communications, human resources, as well as new technologies. However, that level was canceled in 2023 due to low enrollment. In 2020, Virginia Tech moved the course online to allow students to participate during the COVID-19 pandemic. In 2021 and 2022, the course was offered online, as a combination of live and recorded sessions. Virginia Tech held the Short School in-person from July 31 to August 4, 2023, and had 101 students attend.

VDH continues to sponsor waterworks-specific management training targeted at "decision-makers." Virginia Tech, Mountain Empire Community College, and other service providers hold these courses through contracts with VDH. Course offerings vary yearly; however, VDH ensures training courses develop employee and waterworks' TMF capacity. Owners and operators find course offerings on the VDH website.

The COVID-19 pandemic created many challenges for in-person training. VDH cancelled all in-person courses on March 13, 2020, because of health risks. VDH and Virginia Tech successfully transitioned some

courses to webinar-based courses. Course attendees gave favorable feedback for these webinars. DPOR offered extensions for renewal and testing for licensure. In 2022, VDH began transitioning back to in-person instruction; most courses were in-person in 2023. Overall, waterworks representatives respond favorably to in-person instruction and benefit from not just the presented material, but opportunities to learn from other professionals in the class. VDH also found that students remain receptive to online learning. Hence, VDH continues to support that model of instruction through webinars offered through the Virginia Tech contract.

3.6 WATERWORKS ADVISORY COMMITTEE

The SDWA requires states to identify persons with interest or involvement in the creation and execution of a capacity development strategy. VDH consults with the Waterworks Advisory Committee (WAC), which represents a diverse group of waterworks stakeholders throughout the Commonwealth. The WAC committee gives stakeholders and the public opportunities to address VDH policies and procedures, including training and capacity development. Staff consults with the WAC at least quarterly. During the reporting period, the WAC and VDH staff met 17 times.

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4.0 FINANCIAL CAPACITY

Financial capacity reflects the waterworks' ability to balance revenues and expenditures, have acceptable loan ratios, and maintain overall healthy financial data. To secure loans and grants through the Drinking Water State Revolving Fund and other lending agencies, waterworks must demonstrate financial capacity.

4.1 DRINKING WATER STATE REVOLVING FUND (DWSRF)

The DWSRF program provides financial aid through loans, principal forgiveness, and grants. This funding helps waterworks in need of infrastructure improvement, which can help with reliability, maintenance, and operational costs. VDH staff assesses qualifying applicants to determine whether the waterworks has TMF capacity before loan closing. If a waterworks does not have sufficient TMF capacity, then VDH, through its financial partner Virginia Resources Authority, sets requirements for waterworks restructuring as part of the funding process. Requirements may include a Waterworks Business Operations Plan (WBOP), an AMP, waterworks rate increases, the completion of annual audits, or the completion of compliance plans and programs. During the reporting period, the DWSRF entered into binding commitments with 42 waterworks on low-interest or interest-free construction loans totaling \$118,683,043.

The DWSRF program funded important water infrastructure projects and guided those projects to completion during the reporting period. Since the 2020 Report on the Efficacy of the Capacity Development Strategy, staff incorporated several new objectives into the DWSRF program. The Lead Elimination Assistance Program (LEAP) has expanded the program eligibility to include Lead Service Line (LSL) inventory development to facilitate compliance with the Lead and Copper Rule Revisions (LCRR). The LCRR requires all community and NTNC waterworks to develop an inventory of the service lines within their system. The inventory must include the location of the service line and the material it is made of (if known). The inventory is due October 16, 2024. The DWSRF staff will review and score LSL inventory development applications on a quarterly basis through the spring/summer of 2024.

On November 15, 2021, President Biden signed into law a funding package that provided federal funds to improve the condition of water and wastewater infrastructure, along with transportation, broadband and climate, energy, and the environment improvements. This funding is spread out over five (5) years, with the possibility of an additional two for reallocated funds. The DWSRF received funding in the amount of \$90,875,700 across three grants in 2022: The DWSRF Supplemental, Lead Service Line Replacement and Emerging Contaminants. For this solicitation period, which ran from February 2022-May 2022, the DWSRF program received over \$884 million in funding application requests from over 130 localities. Funding agreements are being finalized and loan closings should begin by the end of this calendar year.

The Biden Administration also established the American Recovery Plan Act, Coronavirus State Fiscal Recovery Fund (ARPA). ODW received \$100 million in funding for small/disadvantaged communities across the Commonwealth. The solicitation ran concurrently with the DWSRF Solicitation identified above. A total of 72 applications were received, totaling over \$270 million. The funds have been awarded as 100% grant dollars, benefitting 36 localities with 42 projects. The deadline to claim construction costs is December 31, 2026.

The 2021 General Assembly created three (3) new positions within ODW to test and remediate lead in drinking water at schools and childcare centers. The Lead Testing Program is funded by the Water Infrastructure Improvements for the Nation (WIIN) Act. The 2107 grant provides testing kits for the childcare facilities and schools, and the 2105 grant provides remediation assistance. Registration began in September 2022. Outreach to promote this program continues; the program is marketed with the LEAP Program.

The 2022 General Assembly allocated \$1 million to establish the Equitable Access to Drinking Water Program within ODW. This funding supports small community waterworks with operation and maintenance expenses associated with regionalization and consolidation. The Fund helps reduce health violations, improves economies of scale, and addresses resilience and reliability at small and disadvantaged systems. ODW will manage and utilize the Fund for recalcitrant, poorly performing, or small community waterworks that can be consolidated to improve economy of scale. ODW received two applications in May and June 2023 and provided additional funding for consolidation.

4.2 PLANNING AND DESIGN GRANT ASSISTANCE

VDH awards Planning and Design funds to small, financially challenged, community and not for profit NTNC waterworks. This grant helps waterworks that would not have the financial ability to evaluate drinking water problems, identify solution alternatives, and make recommendations for correction. Eligible projects include preliminary engineering planning, design of plans and specifications, source water quality and quantity studies, drilling, and installation of test wells to determine source feasibility, or other similar technical assistance projects. Recipients may use funds to address distribution system leakage and water loss. These types of projects often include surveying and mapping of the distribution system (to include type of pipe material and estimated age), water audits to estimate loss from leakage, identification of suspected leak locations, training with leak detection equipment, and review of previous detection work.

VDH increases awareness of grant opportunities available through the planning and design fund program by posting information on its website and in the Virginia Register. The Sustainability Coordinators make direct contact to waterworks about these opportunities. Staff remind waterworks owners of the program, answer questions, and provide information and resources for applicants. The program accepts grant applications year-round and reviews them for acute, chronic, and public health points. Staff review applications that do not have acute, chronic, or public health needs in September every year.

During the reporting period, the maximum grant award was \$35,000 per project through 2022 and was increased to \$45,000 in 2023 to reflect the rising cost of engineering services. VDH committed \$435,000 to fund 12 waterworks planning and design projects. This activity helps support TMF capacity. Waterworks benefit from the new or renovated infrastructure built from the planning activities.

4.3 WATERWORKS BUSINESS OPERATIONS PLAN (WBOP)

A WBOP is the primary document to assess the technical, managerial, and financial (TMF) capacities of a waterworks, as required by § 32.1-172 of the Code of Virginia. A WBOP demonstrates whether a waterworks has sufficient TMF capacity or will need to implement Sustainability Improvements. *Technical Capacity* encompasses the infrastructure and water source of a waterworks (its “physical” assets), as well as intangible assets including the knowledge and skills needed to properly operate a waterworks. *Managerial Capacity* is indicative of the waterworks’ planning and organizational expertise. *Financial Capacity* measures a waterworks’ ability to generate sufficient revenue, to leverage other funding sources, and to manage these funds to meet operational, maintenance, and expansion costs.

Preparing a WBOP guides a waterworks owner through the process of identifying responsibilities, assessing current and proposed conditions, identifying improvements, and establishing a plan to operate the waterworks using successful and sustainable methods. Implementation of the WBOP will improve the TMF capacity of the waterworks and enable it to function in a sustainable manner. This plan, customized for the specific waterworks, provides structured guidance for long-term planning, funding reserve accounts, evaluating staffing needs, understanding infrastructure assets, and establishing a budget that will appropriate funds (or other revenue) sufficient to cover all waterworks-related expenses. During the reporting period, VDH accepted 149 WBOPs as complete.

4.4 SMALL PROJECTS ENGINEERING PROGRAM

The Small Projects Engineering (SPE) program, started in 2014, is an internal-referral program that VDH uses to provide engineering assistance to small community and non-profit NTNC waterworks. Waterworks who seek this help typically do not have the staff to apply for funding programs. VDH procures services from three engineering firms to provide this assistance. Each engineering firm serves a dedicated geographic area. Whitman, Requardt & Associates, LLC provides engineering services to the eastern part of Virginia, Hurt and Proffitt serves central Virginia, and Thompson & Litton, Inc. serves southwest Virginia. Typical projects include engineering drawings for small chlorination systems, evaluation of remedial options for lead and copper, and AMPs. The program saw a decrease in number of waterworks assisted during the reporting period, correlating with the change in working conditions across the Commonwealth during the pandemic. The current contracts will expire in early October 2023, and VDH is in the process of procuring services for the next cycle. During the reporting period, these three firms assisted four waterworks with engineering services, totaling approximately \$70,302.00.

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5.0 SUCCESS STORIES

The reporting period includes the time covered by an Emergency Health Declaration for COVID-19. During and the pandemic, site visits to waterworks were severely limited. Capacity Development staff assisted waterworks with completing the applications and providing the TMF review. In addition to those unique opportunities, during the reporting period, staff accomplished the following:

- Initiated and/or coordinated several training events for waterworks;
- Made numerous marketing efforts to increase the number of waterworks personnel attending training events;
- Developed a “Welcome Packet” for TNC waterworks that identifies requirements and provides resources for new owners;
- Continued to provide training on and tracking of Asset Management Plans;
- Collaborated with United States Department of Agriculture-Rural Development (USDA-RD) and planning district commissions on funding workshops for water and wastewater utilities; and,
- Worked with many utility boards to provide regulatory insight, discuss technical issues, and offer suggestions for funding options.

VDH provides the following success stories to highlight projects and the Strategy. Although not comprehensive, the summaries reflect the type of assistance staff provides through the Capacity Development Strategy.

Arlington Plantation is a small, rural, community waterworks in Northampton County on the Eastern Shore of Virginia. The waterworks serves 24 connections and approximately 45 people. In 2014, the Arlington Plantation Property Owners Association applied for Planning and Design Funds through the Drinking Water State Revolving Fund for developing a Preliminary Engineering Report. The Report identified and prioritized needed improvements and was approved in January 2016. During this time, the waterworks had multiple detections of total coliform bacteria in the distribution system. In 2021, VDH awarded DWSRF construction funds to remove and replace a half-buried storage tank with a 10,000-gallon storage tank, install 2 transfer pumps set above ground, recoat the inside and outside of the 3,000-gallon hydro-pneumatic pressure tank, and add chlorination. The project will prevent catastrophic corrosive failure of both the half-buried storage tank (via soil contact) and the pressure tank. Rehabbing the water plant will add chlorination and provide the community with safe drinking water. After nine years, construction has begun. This project highlights the significant time and resource investment to help a small community to build a plan and implement it.

Russell County Public Service Authority provides water to communities in a rural county in southwestern Virginia. In FY2017, the waterworks applied for DWSRF construction funding. In August 2022, the waterworks closed the loan on its project. The waterworks received \$89,230 in principal forgiveness. The project consists of constructing a generator receptacle and manual transfer switches at two water treatment plant sites so that the Russell County Public Service Authority can provide backup electric power to the water treatment plant during power outages. This project will ensure no disruption in water service during extreme weather events.

Darden’s Mill Estates is a small subdivision in Southampton County, Virginia, with 54 connections serving approximately 180 people. The waterworks changed hands following the death of its previous owner. The current owner struggled with maintaining the system adequately and failed to collect required water quality samples. Staff provided guidance and technical assistance, but the compliance and maintenance problems persisted. After VDH issued Notices of Alleged Violation, the waterworks received a Special Order to require compliance with applicable regulations. In 2020, the Circuit Court of Southampton County entered a Court Order requiring the owner to take certain steps to comply with a pre-existing special order and the Waterworks Regulations. The owner did not comply with the Court Order. In July 2023, the waterworks was placed into

receivership by the Circuit Court. The receiver has experience operating waterworks in Virginia and is in control of the assets of the waterworks during the receivership. The owner has agreed to sell the waterworks by February 2024. Resolving the managerial issues at this waterworks has taken a lot of staff time, expertise, and collaboration with other agencies.

The Light Academy is a non-profit school with an approximate combined population of 65 students and staff located in Fluvanna County. The waterworks had a non-functioning corrosion control system, which caused Copper Action Level exceedances during two, 6-month periods in 2019, and contributed to bacteriological problems. The ODW Small Project Engineering Program recommended treatment modifications. Once the engineering was completed, the waterworks proceeded with construction. On March 30, 2021, ODW completed the final construction inspection of the corrosion control and disinfection treatment for waterworks. The final design included two calcite contactors, sodium hypochlorite feed, and sufficient contact time to achieve 4-log virus inactivation. The waterworks is now meeting bacteriological and lead and copper requirements.

E. L. Goddard Inc. owned seven small, rural, regulated waterworks in Northumberland County, in addition to other smaller systems that did not meet the definition of a waterworks. The owner was under a Consent Order to correct compliance sampling. With ODW help, a licensed operator returned the systems back into compliance with the Virginia *Waterworks Regulations*. ODW also identified a utility company who was willing to purchase the waterworks. The E.L. Goddard systems were sold in the Summer of 2023. Funding for the repairs and maintenance came from the Equitable Access to Drinking Water Fund. This represents the resolution of problems spanning many years.

The Pine Hill Community Waterworks, located in Roanoke County, serves 21 rural connections. VDH staff received notice that the system was out of water in October 2021. Staff began gathering information and went on site to investigate the situation. Staff found an inoperable booster pump, which supplied pressure throughout the distribution system. Due to the increased lead times in locating and receiving parts, the waterworks owner could not get the necessary pump quickly. Staff reached out to the Western Virginia Water Authority to provide a properly sized pump within a few hours for Pine Hill to use. The waterworks issued a precautionary Boil Water Advisory, which was lifted following restoration of service and satisfactory bacteriological sampling results.

6.0 EFFICACY OF VIRGINIA'S WATERWORKS CAPACITY DEVELOPMENT STRATEGY

The Capacity Development Strategy focuses on TMF components to improve a waterworks' ability to reliably produce and deliver safe drinking water to consumers. VDH's focus on TMF capacity maximizes the Strategy's potential. VDH enforces rules and regulations and provides technical assistance to improve performance and sustainability of waterworks.

Small waterworks must develop and improve TMF capacity for long-term viability. The complexity and number of federal drinking water regulations is increasing over time. VDH must implement, monitor, and enforce these changes. Staff must provide technical assistance, track routine sanitary surveys, and evaluate the capability of waterworks to ensure compliance with state and federal drinking water standards. The Strategy helps waterworks who are responsible for providing safe drinking water to people of the Commonwealth of Virginia.

The Commonwealth provides a 20% match to the federal Capitalization Grant, which supports the services described in this report. Technical assistance fees from the regulated community pay less than 25% of salary and benefits for staff positions that offer technical assistance. EPA's Capitalization Grant, through the capacity development and source water set-aside, pays for ODW staff dedicated to capacity development, training, and security. Dedicating more state funding to programmatic initiatives would benefit struggling waterworks.

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7.0 CONTACT INFORMATION

This report has been prepared by the Virginia Department of Health, Office of Drinking Water, for submittal to the Honorable Glenn Youngkin, Governor of Virginia. Submit questions or comments on this report to:

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This report is available to the public on the VDH Office of Drinking Water website at:
<https://www.vdh.virginia.gov/drinking-water/capacity-development/>

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APPENDIX A – ACRONYMS AND ABBREVIATIONS

This is a listing of the acronyms and abbreviations appearing throughout the report and its appendices.

ABC – Association of Boards of Certification

AMP – Asset Management Plan

ARPA – American Recovery Plan Act, Coronavirus State Fiscal Recovery Fund

AWIA – America’s Water Infrastructure Act

AWWA -American Water Works Association

BSSP – Bacteriological Sample Siting Plan

CCCP – Cross Connection Control Program

CCR – Consumer Confidence Report

DPOR – Virginia Department of Professional and Occupational Regulation

DWSRF – Drinking Water State Revolving Fund

EMP – Emergency Management Plan (for Extended Power Outages)

EPA – United States Environmental Protection Agency

ETT – Enforcement Targeting Tool

FTE – Full Time Employee

GIS – Geographic Information System

LCRR – Lead and Copper Rule Revisions

LEAP – Lead Elimination Assistance Program

LHD – Local Health Department

LSL – Lead Service Line

MDBPR – Microbial and Disinfection Byproducts Rule

NOAV – Notice of Alleged Violation

NTNC – Nontransient non-community waterworks

ODW – Office of Drinking Water

OSIG – Office of the State Inspector General

Efficacy of Waterworks Capacity Development Strategy, 2023

PDC – Planning District Commission

PFAS – Per- and Polyfluoroalkyl Substances

PQL – Practical Quantification Level

RAP – Regulatory Advisory Panel

SDWA – Safe Drinking Water Act

SDWIS – Safe Drinking Water Information System

SERCAP – Southeast Rural Community Assistance Project

SPE – Small Projects Engineering

Strategy – VDH's Capacity Development Strategy

SWAP – Source Water Assessment Program

SWPP – Source Water Protection Plan

TMF – Technical, Managerial, and Financial

TNC – Transient non-community waterworks

USDA – RD – United States Department of Agriculture- Rural Development

VA-WARN – Virginia Water/Wastewater Agency Response Network

VDEQ – Virginia Department of Environmental Quality

VDH – Virginia Department of Health

VRWA – Virginia Rural Water Association

WAC – Waterworks Advisory Committee

WBOP – Waterworks Business Operations Plan

WIIN – Water Infrastructure Improvements for the Nation Act

APPENDIX B – 2023 TRIENNIAL CAPACITY ASSESSMENT QUESTIONS

Technical	Is the waterworks score on the Jan 2023 ETT ≤ 10 ?	Does the waterworks have sufficient operator coverage for sick leave and vacation?	Has the waterworks either not received significant deficiencies, or completed timely correction of all significant deficiencies?	Did the waterworks address recommendations from recent sanitary surveys?	Does the waterworks have a written policy for responding to customer complaints?	Are all plans and reports up to date and implemented (e.g., BSSP, LCR Plan, CCCP, CCR, WBOP, Sampling, etc.)?
Managerial	Did the waterworks consistently operate within 80% of its permitted capacity in the last 3 years?	Does the system meet Waterworks Regulations design and construction standards?	Are the waterworks facilities and appurtenances in good operating condition?	Are all service connections metered and is there a water accountability program in place?	Does the waterworks meet all established National Primary Drinking Water Standards?	Have all operators attended a technical training seminar or conference each year covered by this survey?
Financial	Did the waterworks pay the technical assistance fee?	Does the waterworks have at least 45 days cash on-hand to cover expenses?	Is the waterworks budget independent from subsidization by general funds, sewer funds or other funding sources?	Does the waterworks have a written Capital Improvement Plan?	Have the waterworks' rates been adjusted in the past three years?	Does the waterworks have an Asset Management Plan?