pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

November 8, 2023

The Honorable Josh Shapiro
Governor
Commonwealth of Pennsylvania
225 Main Capitol Building
Harrisburg, PA 17120

Dear Governor Shapiro:

Ensuring safe and adequate drinking water supplies for the citizens of the Commonwealth of Pennsylvania is the primary goal of Pennsylvania's Safe Drinking Water Program. The 1996 Amendments to the federal Safe Drinking Water Act (SDWA) provide the framework and funds to help states accomplish this goal by developing and implementing a Capacity Development Program. State Capacity Development Programs use federal funds to implement technical assistance programs that build the technical, managerial, and financial capability of public drinking water systems. In doing so, it improves the water supplier's long-term ability to maintain compliance with safe drinking water requirements, and it helps ensure that federal capitalization funds are put to good use.

The enclosed triennial report on Pennsylvania's Capacity Development Program has been prepared for the Governor's Office in accordance with Section 1420(c)(3) of the SDWA. The report, which summarizes the state-of-the-industry of public water systems in Pennsylvania, is intended to describe the root issues affecting our water supplies and what is being done to address them. The report will also be shared with the public on the Department of Environmental Protection's Web site.

I am pleased to submit this report and am sure you will share in the pride of what we have accomplished. Thank you for your support.

Respectfully,

Jessica L. Shirley

Jessica Shirley
Interim Acting Secretary

Enclosure

Governor's Report on the Capability Enhancement Program

pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Safe Drinking Water

September 2023

Introduction

The 1996 amendments to the federal Safe Drinking Water Act require all states to implement a Capacity Development Program, also known as the Capability Enhancement Program (CEP) in Pennsylvania. The CEP is designed to address the lack of technical, managerial and financial (TMF) abilities of the state's 7,900 public drinking water systems. Limited TMF capability is the root cause for the inability of many systems to meet state and federal health-based drinking water standards. At the request of qualifying systems, the CEP uses facilitators in conjunction with peer-based trainers to assist water systems in improving TMF capability and maximizing public health protection. Pennsylvania's program includes the following components, which are implemented within the Department of Environmental Protection (DEP):

- Capability Enhancement Facilitators (CEF);
- Professional Engineering Services (PES) Program;
- Outreach Assistance Program (OAP);
- Drinking Water and Wastewater Systems Operators' Certification Program;
- Filter Plant Performance Evaluation Program (FPPE);
- Area Wide Optimization Program (AWOP);
- Partnership for Safe Water Program (PfSW);
- Distribution System Evaluation Program (DSE); and
- Source Water Assessment and Protection Programs.

The CEP strategy implements several basic steps:

1. Developing and maintaining a Priority Ranking System (PRS) to identify and rank public drinking water systems most in need of TMF capability assistance.

2. Evaluating priority drinking water systems to define their specific needs for improvement.

3. Developing "action item" lists to identify needs. Sharing action items and setting milestones at each system that participates in the CEP.

4. Offering the PES Program, which assists small systems with engineering needs that they would otherwise be unable to obtain.

5. Monitoring of drinking water systems while they receive assistance to measure progress.

6. Maintaining a partnership with the Pennsylvania Infrastructure Investment Authority (PENNVEST) to ensure that funding recipients for all Drinking Water State Revolving Loan Funds (DWSRF) have adequate TMF capability to operate and maintain the system.

Efficacy of the Capability Enhancement Program Strategy and Prioritization of Capacity Building Efforts

Pennsylvania's Capability Enhancement Strategy (Technical Guidance Number 391-0400-001) intends to improve the delivery of services and support of drinking water systems in the commonwealth. The strategy includes the following:

- Methods and criteria to prioritize all public drinking water systems.
- Factors that encourage or impair capacity development.
- Authority and resource allocations to implement the proposed strategy.
- Method of measuring baseline rating and improvement.
- Description of public involvement in strategy development.
- Description of how the State will encourage and assist systems with asset management

The strategy applies a PRS to identify drinking water systems that may have problems. The PRS uses compliance data from both DEP and the U.S. Environmental Protection Agency (EPA) databases to annually rate systems. Information such as monitoring data, violation counts, and status of certified operators are used to apply a priority score for each community and non-transient noncommunity water system in the commonwealth. The CEFs then collaborate with field staff to determine which systems would be best served by technical assistance as opposed to only initiating enforcement activities.

The strategy also implements an improved method (called the Technical Managerial and Financial Self-Assessment Tool or TMFSAT) to evaluate system needs in detail. The TMFSAT is a capability self-assessment completed by the utility that provides CEFs with baseline information to help prepare them for the onsite TMF assessment. The TMFSAT provides a formal method to document the TMF capability of the individual system and improves DEP's ability to document improvements in TMF capability over time.

Just as importantly, the strategy reflects integration of other related programs. The CEFs seek input from DEP Regional Office drinking water program staff by providing draft action items lists for comment as an effort to ensure that all known capability weaknesses have been identified and included in the action items list. CEFs encourage improved financial and managerial capabilities at systems when FPPEs identify financial and managerial causes for technical issues. Likewise, the CEFs encourage systems to pursue capital funding through the DWSRF using the services of the PES program, if needed.

The strategy outlines how DEP will evaluate systems for their TMF capability prior to awarding DWSRF capital funding through PENNVEST. For systems requesting funding, EPA requires that DWSRF funds only be provided to systems that are deemed capable or that will become capable as a result of the utilization of the funds. Systems are evaluated for their capability prior to DWSRF funding by the CEF first reviewing the system's PRS score. If the score is below an identified threshold, the system is deemed capable. A score below the threshold ensures that the system does not have major compliance concerns. If a system is above the PRS threshold, they are required to complete the Self-Assessment Tool and are evaluated on-site. A capability check list is given to the system outlining any TMF weaknesses that must be addressed prior to them being considered for DWSRF funding.

Capability Enhancement Strategy Implementation Case Studies

Implementation of the capability enhancement strategy takes different paths since no two water systems are exactly alike. The following section will discuss how the capability enhancement strategy was implemented via three case studies. Each case study will contain a brief discussion of system background, the technical assistance approach, and the outcome and/or lesson learned from the approach.

Huntingdon Mills Primary School, Luzerne County

Background

- System referred to CEP to assist with addressing hydrogen sulfide issue in their drinking water

Approach

- PES program helped the system assess the nature of the problem and provide possible solutions
- OAP assistance was offered to provide operator training

Outcome

- The PES program designed and permitted a chlorine injection system to oxidize the hydrogen sulfide, provide 4-log treatment of viruses, and provide a chlorine residual for additional health protection for school students and faculty
- The OAP provided the certified operator on-site training on proper system operation and maintenance

Lessons Learned

- Overcoming unique challenges assisting small public education facilities and navigating funding process
- Providing training to operator with many responsibilities beyond daily water system operation

Hazel Hurst Water Association, McKean County

Background

- Small water association with 76 connections
- System referred to CEP for assistance in addressing exceedance of EPA health advisory level of 1.0 mg/L for manganese in finished water that resulted in Tier 1 "Do Not Consume" public notice to its customers
- Assessment of the system discovered that, over the previous few years, the source water quality in their sole well source changed and the treatment at the water system was not designed to effectively treat the degraded water quality

Approach

- DSE program conducted sampling within their single storage tank to help troubleshoot the manganese problem
- PES program expedited an extensive feasibility study to evaluate options for correcting the excessive manganese in the treated water

Outcome

- The feasibility study was presented to the water system
- The following options were investigated in the hopes of finding a solution:
    - Replace the existing groundwater source
    - Public and private partnerships were considered to potentially consolidate with another water system less than a mile away
- Hazel Hurst opted to replace the existing groundwater source and PES assisted with permitting the new source and designing new treatment plant
- PES assisted Hazel Hurst to apply for PENNVEST funding and resulted in the system receiving $1 million in funding with 88% debt forgiveness and 12% low interest loan

Lessons Learned

- There is often no easy short-term solution
- Continued engagement and coalition building are often required to achieve a successful outcome
- Small water systems are often not prepared or equipped to apply for funding independently and assistance is needed to navigate the process

Curryville Water Authority, Blair County

Background

- Small water authority serving a population of 86 people
- System referred to CEP to assist with groundwater rule violation
- Groundwater source heavily impacted by nitrate and current nitrate treatment system near end of useful life

Approach

- OAP provided training for new board members
- PES program assisted in completing installation of contact piping to achieve groundwater rule compliance
- Concurrently, discussions were facilitated with neighboring water system to explore shared management and/or consolidation

Outcome

- A binding intermunicipal agreement was signed by Curryville and the neighboring system to complete an interconnection that will provide safe drinking water
- The PES program assisted with the design and permitting of 1-mile line extension/interconnection and completed PENNVEST funding application to fund construction costs
- PENNVEST awarded the $2.2 million project 91% grant from state revolving funds while remaining 9% was low interest loan
- Construction of the line extension started Fall 2022 and was completed in 1st quarter 2023 when Curryville began receiving safe drinking water through the interconnection

Lessons Learned

- Building on early success allowed the CEP to work with local decision makers to gain support of a long-term regional solution (interconnection)
- Finding long term solutions require persistence and patience
    - CEP involvement started in Fall 2014 and continued until Spring 2023.

Statewide Public Water System TMF Improvement

The statewide public water system TMF improvement is measured using the following parameters:

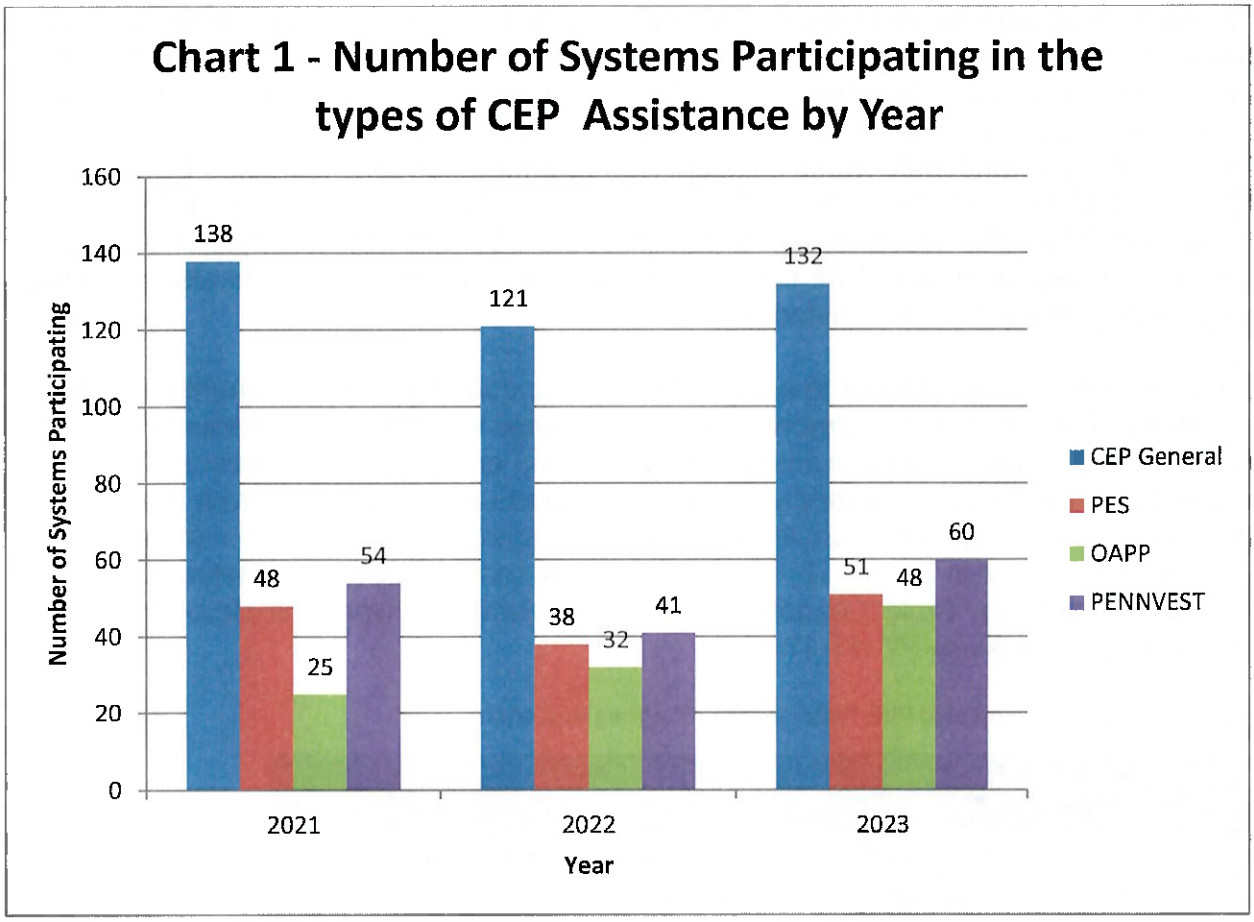
- The number of water systems benefiting from hands-on assistance through the CEP and OAP;
- The number of PES projects that successfully resulted in improved capability;
- The number of systems that do not have a properly certified operator (The goal is to reduce this number.);
- The number of systems that successfully addressed TMF action items noted by the CEFs; and
- The number of surface water treatment plants with a FPPE rating of "Commendable."

Three CEFs coordinate assistance to drinking water systems that participate in the

program. The CEFs manage the PES contract, refer systems to the OAP, evaluate systems for PENNVEST funding, and refer systems for operator certification training and testing. Below are some highlights of the CEP.

Capability Enhancement Facilitator Coordinated Assistance

The CEP had direct contact with 132 systems in state FY '22-23. Typically, the assistance type is divided into smaller categories. Some systems may be included in more than one category. Chart 1 depicts the breakdown of the number of systems participating in the CEP by the type of assistance provided.



The CEP saw a consistent trend in the total number of systems helped during the three-year period which can be attributed to the PES program building on success and integrating OAP assistance with each PES project. The number of systems evaluated for DWSRF(PENNVEST) funding has increased which was expected as systems take advantage of Bipartisan Infrastructure Law (BIL) funding. DWSRF evaluations are system-driven based upon how many systems apply for funding and are not a measure of CEP effectiveness as much as it is a measure of CEF workload.

Currently, site-specific success is measured by noting systems' completion of action items in their evaluation report on a system-by-system basis. To date, several systems receiving assistance have employed a certified operator, implemented standard operating procedures, and are working toward the basics of asset management as a result of action items identified by the CEFs. Concurrently, the PES program is providing needed engineering support to these systems and acting as entrance to other technical assistance options.

Professional Engineering Services Program

The PES Program has become the primary tool in assisting small water systems. PES provides engineering design to small systems that would otherwise not be able to pay for services of a professional engineer. These are long-term projects that involve DEP's contracted engineer in the private sector to provide feasibility and/or design work while the system simultaneously works through TMF recommendations identified by the CEFs. In order to be included in the PES Program, systems must agree to address certain identified TMF weaknesses. In this way, the CEP can obtain "buy-in" from the system to make necessary TMF changes to improve their capability while also providing engineering and outreach assistance.

Baseline numbers are difficult to assign for measuring abstract improvements in TMF capability. The CEFs conduct monthly status meetings with the PES contractor to monitor the progress of each system that is receiving engineering assistance. This allows the CEFs to stay informed with project progress and ensure systems are addressing their action items while also receiving engineering support. Since the PES program's inception in FY '11-12, 151 PES projects have reached completion and 48 are still progressing. Table 1 denotes a count of projects that were completed through the PES program since FY '11-12.

Table 1 – Count of Completed PES Projects since Program Inception

No. of Projects	General Project Type
33	Source evaluation, exploration, siting, permitting
21	Groundwater Rule 4-log design and permitting
12	Engineering Evaluation/Report
11	Leak Detection
9	Feasibility Study
9	Distribution Line Replacement/Addition
8	Corrosion control treatment feasibility study, permitting
8	Funding Support
7	Construction oversight

7	Bid/Contract Administration
6	Interconnection
6	Finished water storage
6	System Mapping
5	Fe & Mn Treatment Design/Permitting
2	Spring Rehabilitation
1	Tracer study

Outreach Assistance Program

The OAP provides both direct assistance to system operators or management and assistance via small-group workshops. Individual assistance was provided for plant operations (jar testing, chemical feed pump calibration, iron and manganese removal, disinfection by-products control), lead and copper rule compliance, asset management plan development, and water loss control. Small group workshops include introductory water auditing, nitrification control plan development, and operator certification exam preparation.

The following examples highlight some of Pennsylvania's approaches to providing assistance and addressing needs:

- Pennsylvania has plotted operator certification information through Geographic Information System data. DEP utilizes the map to target areas with concentrations of uncertified or under-certified operators for training and testing through our Approved Examination Provider program.

- In 2012, the OAP piloted a program to target less populated areas that have uncertified or under-certified operators through DEP's OAP. The pilot program proved highly successful, and OAP continues to provide training and certification as needed for trainees from small systems in remote parts of the state to enable those systems to comply with Operator Certification regulations.

- During a review of Action Item Lists that were developed as a result of the TMF evaluation in the PES process, several items appeared to be common deficiencies:

    - Asset management plan
    - Water loss control
    - Plant process control

As a result, the OAP has recruited assistance providers with expertise in these areas to better address the needs of water systems entering the PES program. In addition, where gaps exist either in expertise and/or geographical state coverage, the OAP is seeking partnerships with other technical assistance providers (Rural Communities Assistance Partnership (RCAP), Susquehanna River Basin Commission (SRBC), American Water Works Association (AWWA), Pennsylvania Rural Water Association (PRWA), University of Pennsylvania Water Center and other entities) to build resources available for water systems lacking TMF capability to receive the assistance they need to become more sustainable.

- The OAP has partnered with the Great Lakes Program to develop a three-part intermediate water loss control workshop. The first workshop focuses on using the free AWWA Audit Software to compile a water audit. The second workshop focuses on Metering and Billing, and the third workshop focuses on leakage management. The workshops were piloted in the Lake Erie Basin, and OAP has since delivered the workshops in other regions of the state in partnership with the Southwest PA Commission, SRBC, DRBC, and RCAP.

- In 2019, the OAP piloted a collaborative effort to assist parent and consecutive water systems to complete nitrification control plans. The effort included a joint training session detailing chloramination disinfection and how nitrification occurs in distribution systems. An expert then assisted the parent system and each consecutive system to complete their nitrification control plan and set realistic goals and response actions to prevent nitrification. The training enabled parent and consecutive systems to not only discuss their individual challenges in maintaining water quality in their distribution systems but also determine how they could work together to achieve their individual goals through coordinated flushing and storage tank management. The training received very positive feedback, so the OAP is seeking other parent/consecutive systems willing to start a dialog.

Drinking Water Operator Certification Program

As indicated in Chart 2, information from the most recently available data shows that 95% of the non-transient noncommunity water systems (NTNC) and 99% of community water systems (CWS) have designated their available operator(s) in 2022. These recent percentages are consistent when compared to the previous two years and represent a stable and robust trend. While there remains room for improvement in the percentage of NTNC and CWS designating an available operator, the coordinated efforts of the operator certification program, training section, and regional operations staff have yielded solid results in improving public health protection by ensuring water systems have properly certified operators operating their facilities.

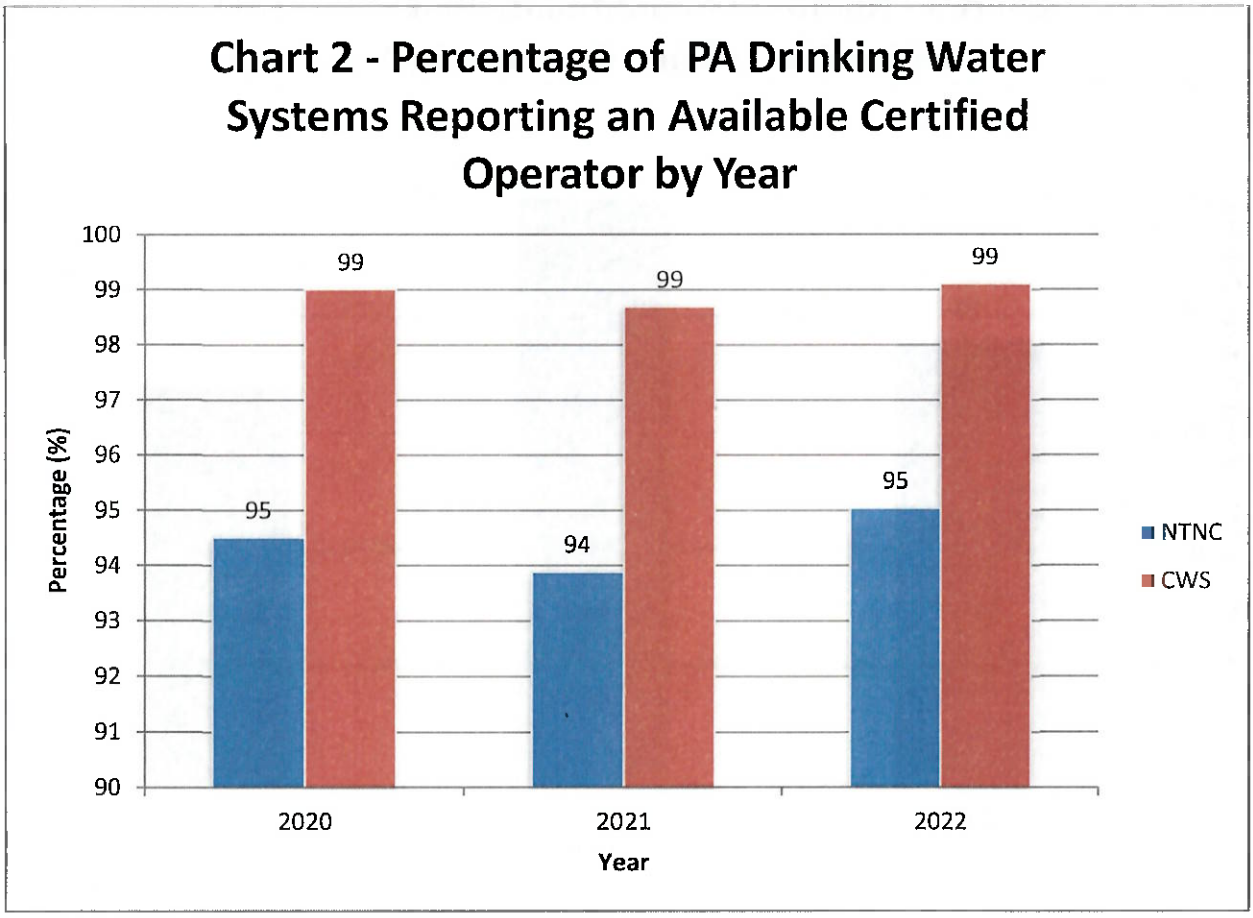
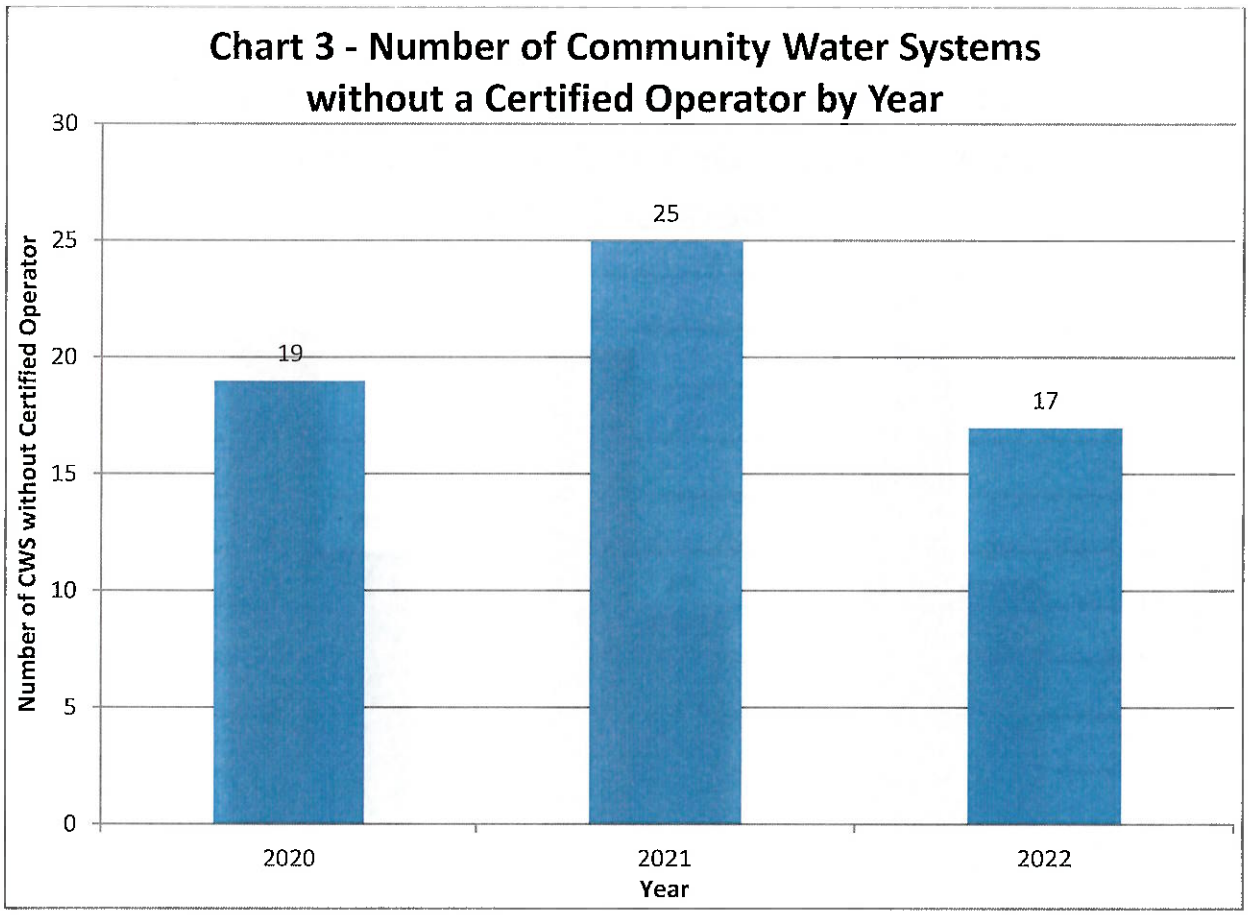
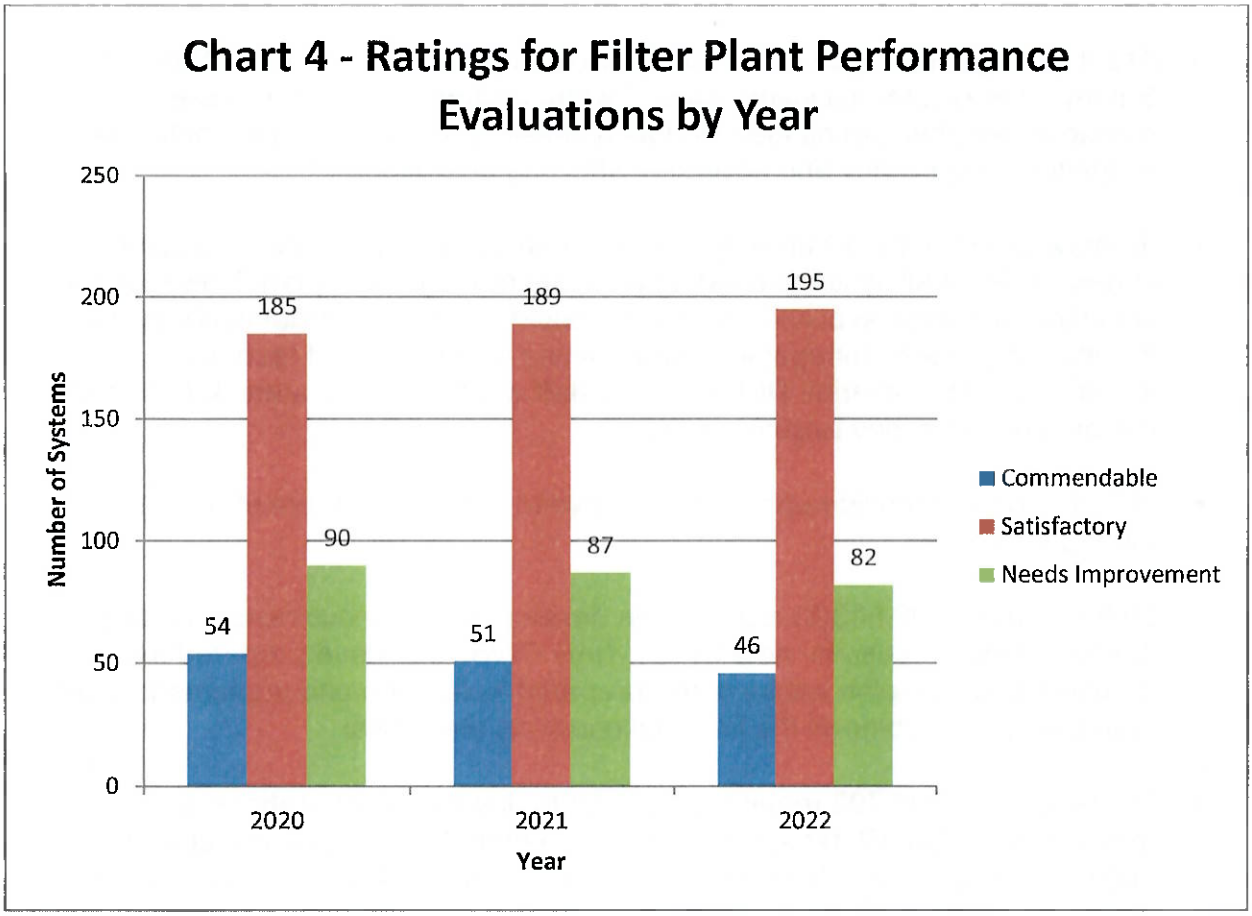


Chart 3 shows that the number of CWS without a properly certified operator has been relatively consistent over the last three years. Efforts by DEP's Operator Certification Program staff and Regional Office staff have helped maintain consistent system compliance. The CEP program's targeted trainings and certification exams have also helped systems obtain and maintain properly certified operators.



Filter Plant Performance Evaluation, Area Wide Optimization and Partnership for Safe Water Programs

The national AWOP and the PfSW Program is intended to help states and water systems with the implementation of optimization programs. Both programs are intended to assist filter plants in improving performance and maximizing public health protection. The programs are closely integrated with DEP's FPPE Program. Chart 4 shows a comparison of FPPE ratings for 2020 to 2022. Through this comparison, DEP can measure performance improvements at individual filter plants.



Asset Management Incentives and Assistance

Pennsylvania uses the following to incentivize and assist systems commence an asset management program:

- TMFSAT includes multiple questions related to operations and maintenance, asset inventories, and asset management plans. The results of the TMFAST are used to help water systems develop specific action items for improving system capability. One of the most common action items identified by the TMFSAT at small water systems is the need to develop and implement an asset management plan.

- The existence of an asset management plan is one of the TMF capability criteria that is evaluated during the PENNVEST capability review and ranking process. An asset management plan that is being actively implemented is worth up to 5 PENNVEST priority ranking points. This is a strong incentive to both develop and implement an asset management plan.

- Asset Management questions have been added to Module 8 of the Sanitary Survey Checklist for full inspections of water systems. Lack of an asset management plan can be identified as a violation of § 109.4 if it is contributing to a significant deficiency and adversely affecting operations.

- Pennsylvania does not currently have the capability to generate a complete statewide list of all systems needing an asset management plan. However, if this capability becomes available, such a list could be used to target water systems for attending asset management plan training, webinars, and technical assistance. In the interim, DEP regional staff will continue to alert BSDW staff to system needs as they become aware.

- PENNVEST will provide up to $25,000 toward the development of an asset management plan.

- 25 Pa. Code § 109.503(3) requires the development of a business plan as part of the permitting process for new CWSs. New CWSs that have prepared the required business plan will be better prepared to develop and implement asset management as some of the financial concepts are similar.

- 25 Pa. Code § 109.702 requires all CWSs to develop an operations and maintenance plan. Water systems that have prepared the required operations and maintenance plan, have begun the process to identify and inventory their assets. In addition, water systems implementing an operations and maintenance plan and performing preventative maintenance will help extend the useful life of their existing assets.

- 25 Pa. Code § 109.706 requires all Public Water Systems (except bottled water systems, vended water systems, retail water facilities, and bulk water hauling systems) to prepare a system map which includes specific details (e.g., pipe type, pipe size, pipe age, etc.). Water systems that have prepared the required system map, have already begun the process to identify and inventory their distribution system assets which is one of the first steps in preparing an asset management plan.

- The Environmental Finance Center (EFC) occasionally offers a one-day Asset Management Workshop through the EPA Technical Assistance Grant. In addition, DEP offers a two-hour web-based training course on EarthWise Academy called "Leadership and Decision Making for Sustainable Water and Wastewater Infrastructure" that discusses the benefits of asset management. Pennsylvania will continue to work with third party technical assistance providers to make asset management training available in Pennsylvania.

- Pennsylvania's OAP has staff available that can provide one-on-one on-site assistance to help water systems develop an asset management plan. The availability of this technical assistance is advertised through the OAP brochure which can be found on DEP's eLibrary. Copies of the brochure can also be shared with interested water suppliers during DEP inspections, FPPEs, at technical conferences, PENNVEST planning consultation meetings, and through email and paper mailings.

- Pennsylvania will continue to encourage interested water suppliers to participate in asset management planning, rate setting, capital improvement planning, and other managerial and financial related webinars and trainings hosted by the following organizations:
    - EPA Infrastructure https://www.epa.gov/dwcapacity/about-asset-management
    - United States Department of Agriculture Rural Development https://www.rd.usda.gov
    - Rural Community Assistance Program https://www.rcap.org
    - EFC https://efc.sog.unc.edu
    - PRWA https://www.prwa.com
    - Pennsylvania Section American Water Works Association https://www.paawwa.org
    - Water Works Operators Association of Pennsylvania https://www.wwoap.org

- Pennsylvania will continue to encourage water suppliers to follow EPA's existing asset management guidance in preparing their asset management plans. Water suppliers may also use their own or other asset management resources, tools, rates setting dashboards, level of service goals, asset management software, inventory and mapping tools, etc. In all cases, Pennsylvania will strongly encourage water systems to incorporate EPA's five core principals into the asset management planning process:
    1. What is the current state of the utility's assets?
    2. What is the utility's required "sustainable" level-of-service?
    3. Which assets are critical to sustained performance?
    4. What are the utility's best "minimum life-cycle cost" capital improvement plan and operations and maintenance strategies?
    5. What is the utility's best long-term financing strategy?

Although Pennsylvania strongly encourages all water suppliers to develop and implement an asset management plan, Pennsylvania's Public Water System Capacity Enhancement Strategy does not condition DWSRF eligibility based on whether a system has developed an asset management plan. DEP believes that this type of conditioning could discourage some water suppliers from making important infrastructure improvements that are needed to strengthen public health protection.

For more information about asset management, please visit the DEP BSDW asset management webpage at www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/CapabilityEnhancement/Pages/AssetManagement.aspx

DEP included the above information in its revised Capability Enhancement Strategy to address the Asset Management requirements of the 2018 America's Water Infrastructure Act (AWIA). Stakeholder input was received on July 23, 2020 by the Public Water System Technical Assistance Center Board. All feedback was incorporated into the strategy. The revised strategy received EPA Region 3 approval on April 6, 2022. The draft strategy was then posted for public comment in the PA Bulletin on July 16, 2022. DEP will next post the strategy as final in the PA Bulletin.

Additional Capacity Development Initiatives

Source Water Assessment and Protection Programs

The CEP integrates source water evaluation, protection, rehabilitation and exploration into its evaluation of each system. When a system is determined as needing assistance with source issues, the CEF facilitates the assistance through either the OAP or PES Programs. The CEF can also refer the system to DEP's source water protection facilitators, who are located regionally for assistance with source water assessment and protection.

Distribution System Evaluation Program (DSE)

The aim of the DSE program is to identify and address distribution system water quality and quantity limiting factors related to disinfectant residual, disinfection by-product (DBP) formation, microbial activity, chemical characteristics, distribution operations, and security. The intent of the program is to not only address regulatory requirements, but to also encourage distribution system optimization. Optimization refers to the process of voluntarily striving to improve the effectiveness of treatment processes and operations to improve drinking water quality to the highest levels possible, often exceeding the regulatory requirements. Water systems that choose to pursue optimization believe that doing so will allow them to provide an increased degree of public health protection to their customers.

Public Availability of Report

More information about the contents of this report and the CEP is available by contacting DEP's Division of Training and Technical Services at (717) 787-0122 or at the mailing address below. Information may also be obtained from the DEP's website at

http://www.dep.pa.gov/Business/Water/BureauSafeDrinkingWater/CapabilityEnhancement/Pages/default.aspx.

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