

Report to Governor

CAPACITY DEVELOPMENT
for
MARYLAND PUBLIC DRINKING WATER
SYSTEMS



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Executive Summary

Ensuring safe and sustainable drinking water supplies for Maryland's citizens is one of the primary responsibilities of the Maryland Department of the Environment (MDE). MDE oversees numerous programs and activities to make sure that public drinking water systems are constructed, operated, and maintained in a manner that ensures the drinking water produced by public water systems is safe to consume, and that there is a sustainable supply to meet current and future needs of Marylanders. MDE's Water Supply Program (WSP) accomplishes this goal through the implementation of the Safe Drinking Water Act (SDWA).

This Act requires that states develop programs to ensure that both new and existing water systems have the technical, managerial and financial capacity to provide safe drinking water to their customers. In 1999, Maryland adopted regulations requiring owners of new water systems to demonstrate that their systems are viable and have sufficient capacity. In 2001, EPA approved Maryland's capacity development strategy to improve the capability of Maryland's existing public drinking water systems. The strategy was revised in 2009 and 2017. Maryland's primary strategy for improving capacity in existing systems is to identify the areas of greatest need and focus technical assistance and training efforts toward those areas. In addition, the WSP undertakes many other activities that help water systems remain in compliance, including routine inspections, funding assistance, onsite technical assistance, operator training, laboratory certifications, source water assessment, and consolidations of water systems where appropriate.

EPA requires states to prepare triennial reports to their Governor, focusing on two main components, capacity development authority for new public water systems, and capacity development strategy for existing public water systems. EPA may withhold 20% of a state's funding if the state fails to submit a triennial report.

This triennial implementation report details Maryland's capacity development program for new and existing water systems, and the progress made toward improving capacity; it summarizes activities for calendar years 2014 through 2016. Data pertaining to MDE's current efforts to improve water system capacity are compared with baseline data collected in 2001 to assess improvements in water system capacity. Through these efforts, Maryland has maintained one of the highest rates of compliance among all states, ensuring the safety of the drinking water for more than 5.3 million Marylanders who rely on water provided by more than 3,500 public water systems.

Introduction

Ensuring safe and sustainable drinking water supplies for Maryland citizens is one of the primary responsibilities of the Maryland Department of the Environment (MDE). Community water systems throughout the State provide drinking water for almost 85% of Marylanders. MDE oversees numerous programs and activities to make sure that public drinking water systems are constructed, operated, and maintained in a manner that ensures the drinking water produced by these systems is safe to consume, and that there is a sufficient supply to meet current and future needs of Marylanders.

The 1996 Safe Drinking Water Act (SDWA) Amendments required States to develop a program to strengthen the managerial, technical and financial capacity of water systems to reliably deliver safe drinking water. State capacity development programs must have two main components: (1) legal authority to ensure that new water systems have sufficient technical, managerial, and financial capacity to meet drinking water standards; and (2) a strategy to identify and assist existing water systems needing improvements in managerial, technical, or financial capacity to comply with standards. Maryland's legal authority for ensuring new water systems have sufficient technical, managerial, and financial capacity was established in regulations adopted in 1999, Code of Maryland Regulations (COMAR) 26.04.01.36. Maryland's strategy for improving public drinking water system capacity was originally approved by the Environmental Protection Agency (EPA) in 2001, and most recently revised in 2017.

This triennial report on the efficacy of Maryland's capacity development strategy for public drinking water systems has been prepared for the Governor's Office in accordance with Section 1420 (c)(3) of the SDWA. Reports on public water system capacity development have been submitted triennially to the Governor's Office since 2002. This report documents capacity development progress and evaluates the effectiveness of the State's capacity development strategy as reflected by inspection and compliance data collected through Calendar Year 2016. This report will be made available to Maryland citizens through MDE's website.

Background

This triennial report on the efficacy of Maryland’s capacity development strategy for public drinking water systems has been prepared for the Governor’s Office in accordance with Section 1420 (c)(3) of the Safe Drinking Water Act (SDWA). The effectiveness of Maryland’s capacity development strategy is measured through analysis of the progress that has been made toward improving the technical, managerial, and financial capacity of water systems in the state.

The capacity of a public water system is the system’s ability to consistently produce and deliver water that meets all the national primary drinking water regulations. The assessment of a water system’s capacity analyzes three components: technical, managerial, and financial. Technical capacity refers to the physical infrastructure of the public water system (the adequacy of the source water, wells, water intakes, treatment, storage, and distribution), as well as the technical knowledge of system personnel and their ability to apply technical knowledge. Managerial capacity includes ownership accountability, staffing and organization, and the effectiveness of relationships with consumers and regulatory agencies. Financial capacity refers to the financial resources of the water system, including credit worthiness, fiscal controls and the ability to generate sufficient revenue.

A public water system is any facility that serves 25 or more individuals for more than 60 days per year. There are three types of public water systems. Community water systems (CWS), serve year-round residential consumers. Non-transient non-community (NTNCWS) water systems serve recurring consumers, such as a school or daycare, and transient non-community (TNCWS) water systems serve different consumers each day, such as a campground or rural restaurant that have their own water source. Almost 85% of Maryland’s population, approximately 5.1 million people, is served by a community water system.

Table 1 provides information about Maryland water systems and the population they serve.

Table 1						
Drinking Water Statistics	2016	2013	2010	2007	2004	2001
Population of Maryland	6,016,447	5,928,814	5,773,552	5,618,344	5,558,058	5,296,486
Individuals served by community water systems	5,107,864	5,057,350	4,989,406	4,844,668	4,846,923	4,438,335
Percent of population served by community water systems	85%	85%	86%	86%	87%	84%
Percent of population served by individual wells	15%	15%	14%	14%	13%	16%
Number of public water systems	3,295	3,396	3,432	3,533	3,692	3,816
Number of community water systems (CWS)	464	474	473	486	502	503
Number of non-community non- transient community water systems (NTNCWS)	532	544	550	559	576	568
Number of transient non-community water systems (TNCWS)	2,299	2378	2,409	2,488	2,614	2,745
Number of systems using surface water	65	60	59	69	66	64
Number of systems using only ground water	3,230	3,336	3,373	3,464	3,626	3,752

The Water Supply Program (WSP), a program within the Maryland Department of the Environment (MDE) is responsible for implementation of the SDWA in Maryland. In 2001, the Water Supply Program, in response to the SDWA's requirements, developed a strategy, which was approved by the U.S. Environmental Protection Agency to implement capacity development for existing water systems in Maryland. In order to focus capacity development efforts, MDE identifies areas where training is most needed to improve the ability of systems to supply safe drinking water to their customers. Training and technical assistance needs are identified through various sources of information, including a system self-assessment, compliance results, and onsite inspections of water systems. Collaborative relationships with various training organizations are used to target these areas of greatest need.

As new issues have arisen which were not fully addressed by the original Capacity Development Strategy, revisions have been made to the Strategy. In 2002, Maryland experienced severe drought conditions that highlighted the need for comprehensive assessment and response activities related to drought. Recent estimations of growth potential and water availability indicate that a number of Maryland communities could experience water shortages unless steps are taken to better understand the hydrologic system and to carefully plan for future water needs. MDE revised the Capacity Development Strategy to provide for enhancement of activities related to ensuring adequate and sustainable water supplies for Maryland public water systems. For public water systems with supplies that are vulnerable to drought conditions, MDE has implemented measures through its permitting process, requiring water systems to have additional capacity in reserve through securing alternative water sources, executing agreements with nearby water systems, or exploring other feasible options. In addition MDE developed and provided water systems with guidance on preparing for climate change.

The revised strategy continues to identify and promote appropriate training and technical assistance efforts for water systems as a primary component of Maryland's capacity development efforts. The first revision improved the existing program by enhancing the State's drought management program, conducting hydrologic studies of both the Fractured Rock and Coastal Plain regions of the State, assisting water systems with developing and implementing Capacity Management Plans (CMPs) and Water Resource Elements for their comprehensive plans, and promoting water systems' use of water conservation technologies. MDE has also incorporated recommendations for climate change and resiliency, water system security, and emergency response and recovery into the training for water systems.

In 2017, House Bill 270 was passed by the State Legislature and signed by the Governor. The new law requires regulations to be developed that require all public and non-public schools in Maryland test for lead to further ensure the safety from exposure to lead from school's drinking water. The capacity development plan revision for 2017 includes this new initiative.

Challenges

A number of factors present challenges for capacity development in Maryland water systems. The vast majority of Maryland water systems are very small. In Maryland, 343 out of 464 community water systems serve a population of 1,000 or less people. Smaller water systems typically have limited resources and expertise which often results in postponed preventive

maintenance work, limited ability to retain qualified water system operators, and lack of finances to improve infrastructure.

In addition, development has led to a number of new housing and commercial developments in rural areas, exacerbating their already limited resources. Population growth is a challenge that has been taxing for small to medium size communities. For example, since 2013, the population served by Maryland's community water systems has increased by approximately 50,000 translating to an additional demand of 5 million gallons per day. In some cases, water supply systems' sources or treatment plants are not adequate to meet projected needs. Additionally, aging infrastructure, shrinking resources, ever increasing regulatory compliance requirements, and potential climate change impacts, are sometimes more than small water systems can manage. For example since 2001, ten new regulations have been promulgated, some of which required new infrastructure. According to the latest survey by the USEPA in 2011, Maryland's total capital need for the next 20 year is \$6.9 billion.

Changes in treatment technology and complex regulations require water system operators to increase their knowledge and receive additional training to keep up with the new requirements. Relatively low operator salary levels, combined with a shrinking pool of qualified workers have made it increasingly difficult for water systems to attract and retain competent operators.

The Effectiveness of Maryland's Strategy

The effectiveness of Maryland's capacity development strategy is measured through analysis of the progress that has been made toward improving the technical, managerial, and financial capacity of water systems in the State. To that end, information gathered from program databases, sanitary survey inspection records, and surveys of public water systems are used to identify performance areas that have improved, and areas where additional capacity development efforts are needed.

The sources of baseline values included a self-assessment survey, regulatory compliance data, operator certification statistics and information from sanitary survey inspections. A list of 2001 baseline values and comparable 2016 values can be found in Table 2. The following is a discussion of the sources of each of the major components of the baseline

In 2016, MDE replaced the legacy database, Public Drinking Water Information System (PDWIS), with the federal database, SDWIS-State. The SDWIS-State database includes information about water system compliance with water quality standards as well as monitoring and reporting requirements. This database, which has enhanced compliance tracking tools, will help us continuously monitor the progress of water systems in developing technical and managerial capacity.

A sanitary survey is an onsite inspection of a water system which includes an inspection of the sources, the water treatment plant, the storage and distribution systems, and a review of water quality test results and operating and maintenance procedures. Sanitary surveys allow staff to identify significant sanitary defects as well as deficiencies that are not regulatory violations, but have potential public health impacts, and may be an indication of problems with technical capacity. WSP staff work with water systems to help them correct deficiencies and improve their capacity to provide safe and adequate water to their customers.

During sanitary surveys, WSP staff provides guidance and review of standard operating procedures, emergency plans, and other technical and managerial documentation. In addition to improving the technical capacity of the water system, the sanitary survey is often used as a tool for initiating improvements in managerial and financial capacity. The frequency of sanitary surveys ranges from approximately once per year to once every three or five years, depending on the size and type of system, and whether the source is ground water or surface water.

A “self-assessment” survey was circulated to all community water systems in 2001, 2007, and 2014. Survey questions were initially formulated by a workgroup of representatives from local, state and federal public agencies and private industry to solicit information about the technical, managerial and financial capacity of Maryland’s public water systems. It should be noted that while efforts were made by MDE to improve the response rate for the 2014 survey, a final response rate of 47% was achieved, similar to the 2007 survey response. Efforts to increase the response rate included administering the 2014 survey electronically, using an internet-based survey application, reducing the number of the questions, and making follow up calls to offer assistance.

Table 2 provides a summary of the measurement of 12 technical, financial and managerial baseline criteria since 2001. Table 2

Data Source	Measure of Capacity	2016	2007	2001
Technical:				
ETT list ¹	Number of Enforcement Targeting Tool systems (CWS & NTNC)	9 systems	NA	NA
Historical SNC ¹	Number of Historical Significant Noncompliance (SNC) Systems (CWS & NTNC)	NA	37 systems	51 systems
Compliance Data ²	Lead and copper violations (CWS & NTNC)	13%	<13%	13%
Sanitary Survey ³	Percentage of systems with certified operators			
	Community systems	91%	86%	80%
	Non-transient non-community systems	76%	74%	40%
Self-Assessment Survey ⁴	Systems that can meet future 10 year water quantity demands with current sources and treatment	69%	58%	72%
Sanitary Survey ³	Percentage of major non-regulatory deficiencies resolved	97%	90%	67%
Financial:				
Self-Assessment Survey ⁴	The last time water rates were changed (CWS)	Average Years: 1	Average Years: 1	Average Years: 4
Self-Assessment Survey ⁴	Systems that have financial records reviewed at least annually by an independent financial auditor	90%	78%	53%
Managerial:				
Self-Assessment Survey ⁴	CWS respondents aware of whether additional treatment or equipment will be required because of SDWA regulations that will come into effect within the next few years	55%	45%	30%
Self-Assessment Survey ¹	Percentage of systems with service connections metered			
	Residential	74%	60%	25%
	Commercial	71%	50%	4%
Self-Assessment Survey ⁴	Systems that can meet average daily demand with largest source out of service	69%	64%	52%
Sanitary Survey ³	Percentage of CWS systems with emergency plan of operation	83%	75%	43%

¹ EPA no longer requires states to submit Historical SNC (HSNC) lists. This measure has been changed to report EPA's newest measure, the Enforcement Tracking Tool (ETT). This does not compare directly with the number of HSNC systems reported in previous years.

² Data from Table 9 of the 2016 LCR Annual Compliance Report.

³ MDE staff conduct sanitary surveys of public water systems on a regular basis. Frequency ranges from more than once a year to once every five years. The current federal requirement is a minimum of one sanitary survey per system every three years for community systems and once every five years for non-community water systems.

⁴ Self-assessment surveys were conducted in 2001, 2007 and 2014. This table includes a selection of answers to questions from that survey. Surveys are conducted every six years. The survey was last administered in 2014. Value is N/A if there has not been an update since the previous report.

Discussion of Maryland Capacity Development baseline as outlined in Table 2.

Technical Measures

- 1. Number of Enforcement Targeting Tool systems (CWS & NTNC).** During FFY 2011, EPA developed and implemented a new enforcement tool known as the Enforcement Targeting Tool (ETT). The WSP now maintains and reports data using this tool. Any system with 11 or more points on the ETT is considered to be in significant noncompliance. Compliance with drinking water quality has the highest priority, but a water system which routinely fails to monitor or report as required by the regulations might also be included on the priority list. The enforcement status is tracked and reported on a quarterly basis, as opposed to historical significant noncompliance which was reported every three years. As of December 31, 2016, 9 systems had an ETT score of 11 or more. New regulations frequently result in increased violations for systems, as they seek to learn new requirements, identify funding to address infrastructure needs, and meet other challenges. The WSP provides information to water suppliers about available training opportunities, and gives presentations at training events around the State. MDE will continue to focus training efforts on ensuring that all systems are aware of their responsibilities for new and existing regulations.

Number of Historical Significant Noncompliance systems (Last used in 2010). Prior to 2011, the EPA produced a list of water systems with a history of significant noncompliance (SNC) every three years. A system was considered to be a SNC if it violated one or more National Primary Drinking Water Regulation in any three quarters within the most recent three year period.

- 2. Lead and copper violations (CWS & NTNC).** Complex monitoring and treatment technique requirements for lead and copper are difficult for small water systems. Each water system's monitoring requirements can vary widely from year to year and as a result, more violations occur in some years than in others. There were 155 Lead and Copper violations at 143 systems in CY 2016, most of which were monitoring-related violations. The WSP will continue to focus on reducing the number of violations by providing technical assistance and training. In addition, formal enforcement actions are being taken and penalties assessed for systems in significant noncompliance.
- 3. Percentage of systems with certified operators.** Regulations require that community and non-transient non-community water systems are operated by State-certified operators. Through Maryland's certification program, water system employees are evaluated, trained and certified to operate water systems based on the complexity of the water treatment plant. Having a knowledgeable operator is critical to ensuring that water systems provide safe drinking water and meet federal and State requirements. In collaboration with the Board of Water and Wastewater Systems Operators, the WSP began an initiative in 2013 to improve the passing rate of operators who take the certification exam. Measures that have already taken place include: identifying study subjects such as math that operators have the most difficulties with, evaluation of relevancy and appropriateness of questions in relation to the category of exam, standardizing the exam questions and scoring through contracting with the ABC

(Association of Boards of Certification), and transferring the Board to the Water Supply Program. WSP staff continues to provide technical assistance to water systems regarding operator certification requirements and notifies water systems of available technical training that may be of benefit to their operators. MDE provides funding for a number of training classes for operators. The WSP staff also works closely with Board staff to improve operator certification compliance.

In CY 2016, 91% of community water systems and 76% of non-transient non-community water systems employed certified operator(s). This is a dramatic increase from the 2001 baseline of 80% and 40%, respectively. Primarily, water systems that do not currently have certified operators are very small water systems served by wells with minimal or no treatment. The rate of compliance for community water systems that serve 3300 or more people continues to be 100%.

- 4. Systems that can meet future 10-year water quantity demands with current sources and treatment.** Of the water systems that responded to the 2014 survey, 69% say they have adequate water source and treatment capacity to meet their demand for the next 10-years. This number has increased from 58% in 2007. This is a direct attribution to a number of initiatives undertaken by MDE and the WSP that encourage systems to evaluate their capacity in relation to the development within their systems. In 2006, MDE developed guidance for community water systems on assessing their system capacity and planning for future needs. Water capacity can be limited by a number of factors, including the capacity of the water treatment plant or the wastewater treatment plant, limits established by the system's water appropriation permit, and/or the actual availability of a sustainable water source. The WSP has continued to work with water systems whose water use is close to their ability to meet the demand (80% or greater) to assist them in identifying new sources, upgrading their infrastructure, or reducing demand in order to ensure that the systems will be able to provide sufficient water to meet projected demand. In 2011, the WSP hired an engineering contractor to assist up to fifty communities in assessing their capability to meet demand and planning for future development. As mentioned in the previous report, this program was completed in April, 2013 and a total of 42 plans were prepared at no charge to the community water systems.
- 5. Percentage of major non-regulatory deficiencies resolved.** During sanitary surveys, deficiencies that do not constitute regulatory violations but may nevertheless have a significant public health impact are identified. Deficiencies are characterized as major or minor, based on the potential to affect the public health or comfort of the system's customers and the frequency at which the problems are likely to occur. Possible major deficiencies for a water system may include low pressure in the distribution system on a routine basis that makes the water system vulnerable to cross connection, a deteriorated water storage tank, inadequate or unreliable treatment, or a well that is vulnerable to flooding. WSP field engineers work with systems to assist them in addressing deficiencies. Ninety-seven percent of significant deficiencies have been resolved as of the end of CY 2016.

Managerial Measures:

- 1. Awareness of whether additional treatment or equipment will be required because of SDWA regulations that will come into effect within the next few years.** The 2014 survey responses indicate that more managers are aware of how upcoming regulations will affect their operations. In 2001, only 30% of systems knew whether or not they would need additional treatment as a result of upcoming regulations, compared to 45% in the 2007 survey, and 55% in the 2014 survey. MDE has focused efforts on educating water systems about upcoming regulations or new requirements that impact them. MDE will continue to target educational efforts toward ensuring that water system managers and operators are aware of upcoming changes to federal and State laws and regulations. The Maryland Center for Environmental Training offers a MDE funded training class for superintendents of small water systems, which continues to help small water systems become more informed about regulatory and reporting requirements. In addition, Maryland Rural Water Association and Water and Wastewater Operators Association provide regulatory updates in training classes and at their annual conferences for all water system operators and superintendents.
- 2. Percentage of systems with service connections metered.** Metering is a fundamental tool for managing water use by community water systems. Many smaller systems do not have service connection metering that measures the amount of water used by each customer. Individual metering provides the customer with information about how much water they use, and allows the water system to charge more when the customer uses excessive amounts of water, and typically encourages water conservation. Additionally, water systems can use metering to identify water losses occurring from distribution system leaks, theft, or other unauthorized uses. About 74% of the systems that responded to the 2014 survey reported that 100% of their residential customers are metered and 71% of the systems reported that 100% of their commercial customers are metered. These percentages have both increased significantly since the last survey and are dramatically higher than they were in the first survey in 2001. This percentage is expected to continue to increase as water demand escalates.
- 3. Systems that can meet average daily demand with largest source out of service.** Some water systems use multiple sources to supply their customers. This is a critical factor for ensuring the reliability of a water system in case one source goes out of service due to mechanical/electrical failure or other unforeseen reason. The percentage of systems increased from 52% in 2001 to 64% in the 2007 survey, and 69% of the systems that responded to the 2014 survey reported that they can meet average daily demand with their largest source out of service. WSP field engineers work directly with water systems assist them with ways to improve their reliability. WSP will continue to encourage water systems to provide sufficient backup capabilities for their water supplies.
- 4. Percentage of CWS systems with an emergency plan of operation.** An emergency plan of operation is a document that outlines how a community water system responds to various possible emergencies such as power outage, hurricane, terrorism, or water contamination. It also includes telephone and contact numbers for key personnel including water system managers, local emergency responders, chemical suppliers, equipment manufacturers, well drillers, alternative water suppliers, and MDE. The WSP

has focused a considerable amount of energy into providing guidance and technical assistance to water systems regarding this need. During sanitary surveys, field engineers encourage water systems to develop and update emergency plans, and provide technical assistance as needed. In 2013, the WSP completed a contract with the Maryland Rural Water Association to help 66 small CWSs update their vulnerability assessments and emergency response plans. Currently, 83% of community water systems have an emergency plan of operation. The WSP will continue to work with systems to encourage appropriate emergency planning.

Financial Measures

- 1. Last time water rates were changed (CWS).** Frequent review and adjustments of water rates allows systems to cover rising water system costs, and provide adequate funds for future system improvement. The results of the most recent self-assessment survey indicate that water systems are continuing to adjust their rates more frequently than in the past. The WSP has supported training efforts to educate water systems about the importance of establishing appropriate rate structures. Responses to the 2014 survey indicated that the water systems had revised their rates on average within one year, which is similar to the 2007 survey results, and more frequent than four years for the 2001 survey.
- 2. Systems that have financial records reviewed at least annually by an independent financial auditor.** Independent audit of a system's financial records is sound financial practice. The 2014 survey found the percentage of systems that have their financial records reviewed annually continued to increase from 78% in 2007 to 90% in 2014. Both years show a markedly higher number of independent audits than the base point of 53% in 2001.

Next Steps

In addition to continuing with the many ongoing water system capacity development related activities MDE plans to take the following steps to further improve water system capacity:

- Work with training organizations so that training classes cover areas of greatest need.
- Provide additional technical resources accessible to water systems. Increase internet accessibility of training tools.
- Provide training and technical assistance for water systems on newly adopted drinking water regulations.
- Continue monitoring hydrologic conditions and routinely update MDE's drought web pages. Encourage water systems to anticipate and prepare for potential conditions under climate change.
- In the wake of Flint, Michigan, MDE continues to closely monitor lead issues, any changes in treatment processes, and customer complaints.

- In 2017, Maryland enacted legislation (Chp. 386, Acts 2017 - HB 270), which requires adoption of regulations requiring periodic testing for the presence of lead in each drinking water outlet located in occupied public or nonpublic school buildings.
- MDE requires all community water systems with more than 10,000 customers to perform annual water audits to determine the efficiency of the water system. In addition, many water systems whose use has exceeded 80 of their water appropriation permit are required to perform water audits.
- In support of “One Water” management, MDE will foster interdisciplinary collaboration on topics such as drinking water, water quality restoration, water conservation and beneficial reuse, water-related climate change action, and other topics across programmatic boundaries.

Conclusion

The Maryland Department of the Environment’s Water Supply Program focuses on many activities to help public water systems improve their technical, managerial and financial capacity, resulting in better protection of public health. Efforts include providing financial assistance, technical and compliance support, targeted training based on need, encouraging water systems to practice water conservation and improve their capacity to meet drought year demands, and supporting consolidation of water systems.

Maryland water systems continue to maintain a very high compliance rate of over 95% with health-based standards. Water system managers are more aware of new regulations along with treatment needs associated with them, and 69% of water systems believe they currently have sufficient capacity to meet demands 10 years from now. Efforts aimed at assessing and improving water systems’ capacity for potential drought periods has improved their resiliency for future climate control conditions. Water systems have identified a number of training topics of interest that include drinking water regulations, asset management, accounting for leaks and emergency response. MDE plans to work with training providers to ensure that these topics are covered in future training opportunities. MDE looks forward to continued improvements in the technical, financial and managerial capacity of Maryland water systems.

CAPACITY DEVELOPMENT CASE STUDIES

Maryland's statewide capacity development strategy focuses on working with public water systems to prevent violations by improving technical, managerial and financial capacity. The WSP encourages consolidation to correct capacity and non-compliance problems. As regulatory requirements continue to become more numerous and complex, it is becoming increasingly difficult for smaller, independent systems to maintain compliance. Whether two or more small systems merge into one larger system, or a large system extends its service area to a smaller one, consolidation can afford systems the advantage of having a greater pool of resources to provide a safer and more reliable water supply. The case studies in Appendix A provide some insight into the ways in which the Water Supply Program continually works with water systems to improve their technical, managerial, and financial capacity.

Allegany County - Prince Albert/Sunnyside Water Project

This project included the design and construction of waterlines, valves, and fire hydrants to extend public water service from Allegany County's Mt. Savage Water System to this community that was experiencing quality and quantity problems with their private wells. Some residents had resorted to withdrawing water from a creek behind their homes during emergency situations. The extension of public water eliminated a potential public health emergency that could have resulted from using unfiltered and untreated water from the nearby creek. The extension also provides fire protection for the community. A \$150,000 grant from the Drinking Water State Revolving Loan Fund to Allegany County, along with a second \$150,000 Drinking Water State Revolving Loan Fund loan, helped fund this project.

Calvert County – Dares Beach Water System

The Calvert County communities of Dares Beach and Chesapeake Heights are supplied by wells that have elevated arsenic concentrations. After studying effectiveness and the cost of arsenic removal treatment for several years, the County decided to interconnect the two water systems and drill a high capacity well into a deeper aquifer with better water quality. MDE provided technical assistance about the available aquifers and associated water quality, as well as funding to enable the project. Calvert County has now obtained an easement to connect the two water systems and is expected to break ground on the project in 2018.

Cecil County – Pearce Creek / Town of Cecilton Water Extension Project:

For two decades, private wells in several communities in the Earlville section of Cecil County were impacted by a number of contaminants including high amounts of manganese. The cause of the contamination was determined to be dredged material from a project conducted by the Army Corp of Engineers. Through a collaborative effort with the corps, the Maryland Port Administration, and MDE, a 7 mile pipeline has been extended from the Town of Cecilton to connect up to 235 houses with a reliable and safe public water supply. Individual connections to the pipeline are ongoing.

Cecil County – Harbor View Water System

Harbor View is a community of almost 500 people in Cecil County Maryland with a water system owned by the Artesian Water Company. In the summer of 2014, the Water Supply Program received a customer complaint for discolored water. Through site visits and attending several evening community meetings, the Water Supply Program learned that the water complaint was not an isolated incident but rather a community wide problem that was due to increased levels of manganese in the wells. It was determined that installing treatment would be the most economical and reliable solution. However, installing treatment requires design, a construction permit application, plan review, and construction, all of which combined could take six to twelve months to complete. The Water Supply Program recommended that a mobile treatment plant could be installed on a temporary basis for a period of up to twelve months and if successful, converted to permanent use through the issuance of a construction permit. In January 2015, the pilot plant was installed and put into service. The water quality is much improved and the customer complaints have stopped completely.

Harford County – MD American Water Raw Water Storage Impoundment

Water for the Town of Bel Air, the County seat for Harford County, is provided by the Maryland American Water Company. The water system consists of surface water from a creek and two wells. During times of drought, the surface water plant is taken off line because the source does not meet flow-by requirements and Maryland American is forced to purchase water from Harford County. Due to restrictions in the amount of available water from the County, a building moratorium restricting further growth was imposed by the County Health Department. MDE entered into a MOU requiring Maryland American to find a long term solution. Maryland American Water Company is building a raw water impoundment and new intake to store up to 90 million gallons of water. This will result in the lifting of the moratorium and less reliance on purchased water to serve its existing population. MDE funded a \$3.8 million loan for the intake portion of this project.

Montgomery County - Rockville Water Quality Improvements

Rockville, one of Maryland's largest cities, made distribution system improvements in 2013 to reduce disinfection by-products to meet the upcoming Stage II DBP Rule. Initial studies showed that improvements at the Water Treatment Plant would bring the City into compliance, but City engineers decided to look at the entire system for improvement. An engineering company modeled the distribution system and deduced that a few simple improvements could reduce Disinfection By-Products (DBPs) and reduce water age. An accompanying engineering study gave further suggestions for future improvements to minimize water age in the distribution system. The City made several distribution system improvements such as looping dead ends, replacing restricting pipes, taking a storage tank out of service and installing an aeration system in the largest storage tank. The aeration and mixing system reduced THM (DBP) levels 53% in the storage tank and the City has met DBP limits for the last 12 month period.

Prince George's County - Potomac Vista

Potomac Vista, a small water system in Oxon Hill Maryland with a history of water outages, has interconnected with Washington Suburban Sanitary Commission (WSSC) to provide reliable water to the residents. The water system was built in the 1950s and had been in a state of poor repair for the last several years. Water outages from main breaks and loss of power occurred several times each year, putting the community at risk of waterborne illness. WSSC installed water mains nearby, but was not willing to interconnect with the Potomac Vista water system because of the poor condition of the old infrastructure. MDE worked with both groups to secure loans and grants for WSSC to upgrade the Potomac Vista distribution system. In early 2014, the upgrade of the distribution mains was completed, the permanent interconnection to WSSC was made, and the old water plant was disconnected.

Wicomico County – Town of Sharptown

In May 2011, the Town of Sharptown (population 625) entered into a Consent Agreement with MDE that included a schedule for system improvements for compliance with the Stage 2 Disinfection Byproduct Rule. The City's proposed schedule included a new well, installation of an aeration and ventilation system on top of the existing elevated storage tank to remove THMs, and a mixing unit installed in that same tank. A water quality monitoring report provided in July 2015 verified the water quality improvements.

Worcester County - Town of Ocean City

With Technical assistance from the WSP, Ocean City was able to permanently reduce Disinfection Byproducts (DBPs), and meet compliance requirements. Ocean City exceeded a Disinfection Byproduct MCL in 2010 and twice in 2013, requiring the Town to enter into a Consent Agreement to maintain compliance. With MDE's technical assistance the Town constructed major capital upgrades to their distribution system and water treatment plants to reduce DBPs. Subsequent monitoring has found the system is in compliance with the rule.

Worcester County - Golden Sands Club Condominium

Worcester County's Health Department confirmed an "outbreak" of Legionella at the Golden Sands Club Condominium in Ocean City in October 2015. Fortunately, there were no fatalities. The Golden Sands is served by the Town of Ocean City water system and consists of 360 privately owned units in a twenty story building. WSP staff coordinated with the Worcester County Health Department, the Department of Health and Mental Hygiene's Infectious Disease Epidemiology and Outbreak Response Bureau, the Town of Ocean City, and the Golden Sands staff to oversee remediation of the problem. The Water Supply Program approved installation of, and required training for the operation of, a continuous on-site disinfection treatment system. Golden Sands is currently regulated as a consecutive public water system and is one of six commercial properties in Ocean City that use chlorine dioxide for on-site disinfection.