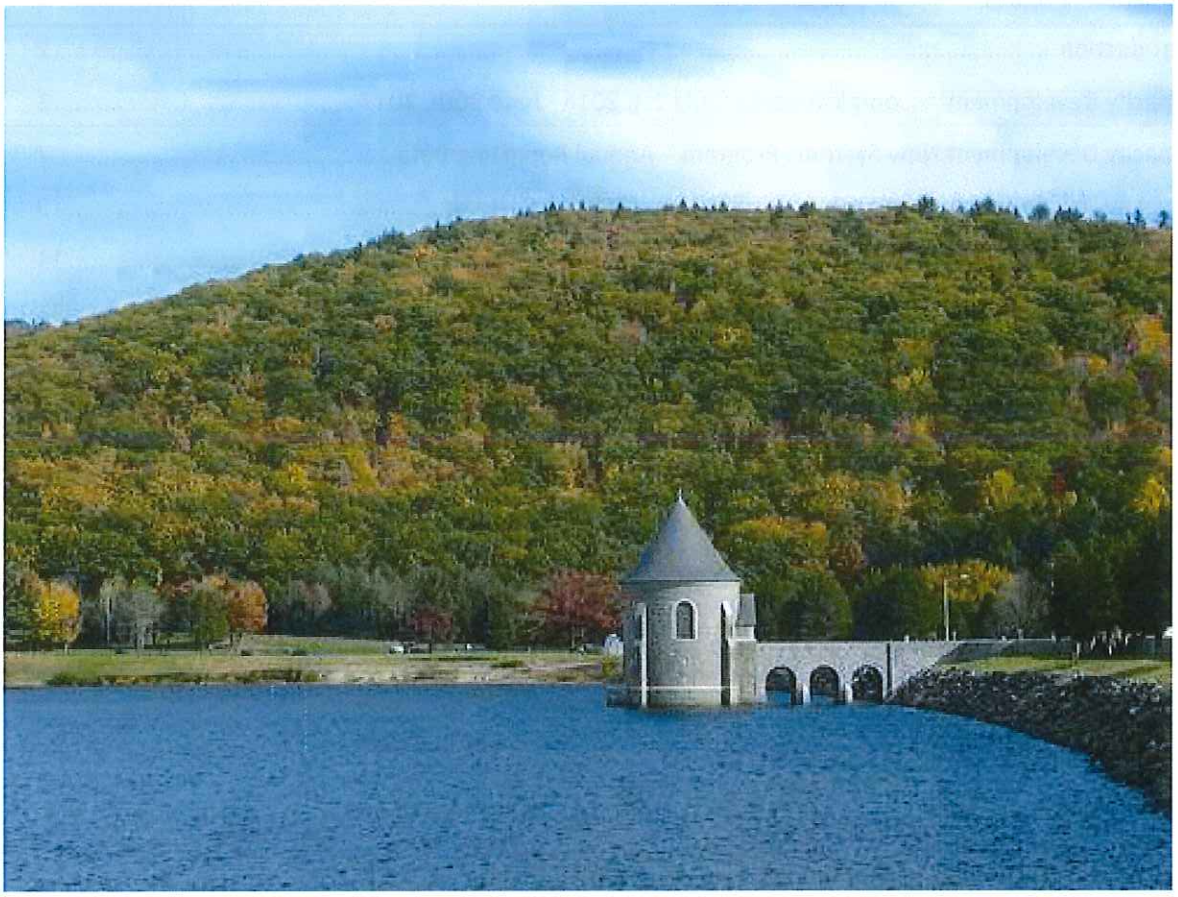
State of Connecticut

Department of Public Health Drinking Water Section



Capacity Development Strategy Status Report

For the Period of July 1st, 2016 – June 30th, 2017

October 19th, 2017

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Executive Summary

The Connecticut Department of Public Health (DPH) is the state primacy agency for implementing and enforcing the Federal Safe Drinking Water Act (SDWA). The 1996 SDWA Amendments requires that primacy states develop a Capacity Development Strategy that addresses the technical, managerial and financial (TMF) needs of public water systems (PWSs). Primacy states are required to provide annual state capacity development program reports to the U.S. Environmental Protection Agency (EPA). Annual reports are required to provide on-going implementation updates for State programs and, at a minimum, must provide the status of programmatic content that is consistent with that provided by the EPA's Office of Ground Water and Drinking Water in the Reporting Criteria for Annual State Capacity Development Program Implementation Reports. A report to the Governor is required to be produced every three years to detail the efficacy of the State's Capacity Development Strategy. This report is inclusive of both the annual reporting criteria and an assessment of the DPH's Capacity Development functions and their successes and challenges over the last three years.

Connecticut's relatively small geographic footprint contains a large number of public water systems (PWSs), as 535 community water systems (CWSs) serve residential populations and 534 non-transient non-community (NTNC) systems and 1,447 transient non-community (TNC) systems serve non-residential populations. The DPH diminishes the associated regulatory burden imposed by this large number of systems through proactive prevention. Early detection of water quality problems and promoting the sustained use of high quality sources for public drinking water are critical aspects. The DPH has long had a strong and unique State Capacity Development Strategy (Strategy) to address this proliferation of small water systems. The State established 'core elements' of the Strategy in state law prior to the Federal mandate for capacity development in 1996 SDWA Amendments. The Strategy strives to maintain systems that have adequate TMF capacity and, when not, attempts to enhance TMF capacity through technical and financial assistance and training. Many small systems lack the TMF expertise that promotes long term sustainability. Systems that lack capacity in one or more of the TMF areas are identified through a prioritization process using "triggers" that identify systems of concern. The DPH encourages and helps to facilitate the consolidation of small systems when feasible. Restructuring systems occurs through formal enforcement actions, direct acquisition by another water system, contracting out certain services to larger systems under receivership, and other alternative solutions as approved by the DPH and the Public Utilities Regulatory Authority (PURA).

Outreach activities, public participation, and creating and maintaining external partnerships are essential to the Strategy. This speaks to our extensive participation in the statewide Water Utility Coordinating Committee (WUCC) regional planning process activity, the State Water Plan, Source Water Collaborative, the small system capacity assessment concept, and increased educational circular letter mailings to name a few. These activities help to forge new partnerships and strengthen old partnerships. Partnerships are critical in defining the state's long-term future water resource and drinking water goals. Connecticut is fortunate that high quality waters remain available for human consumption here unlike in 48 other states. The inherent limitations of high quality source waters and new state minimum stream flow standards are why PWSs must acquire and maintain adequate supply capacity to ensure their public drinking water obligations for current customers and future new customers are met.

Introduction

There are 3 types of public water systems that are regulated in the State of Connecticut:

Community Water Systems (CWS): Water systems that provide service to 25 or more residents at least 60 days per year. Systems can range widely in size from large municipal or privately owned systems to small rural neighborhoods that share a common water supply. Subpart H systems are a subset (primarily of CWS) which is a public water system that is supplied by a surface water or groundwater under the direct influence of surface water source.

Non-Transient Non-Community (NTNC) Systems: Non-residential water systems that serve 25 or more of the same people at least 6 months out of the year that include schools, daycare centers, factories, and office buildings.

Transient Non-Community (TNC) Systems: Non-residential water systems that serve 25 or more people, but not necessarily the same people each day, for at least 60 days out of the year that include restaurants, parks, campgrounds and gas stations.

The DPH, as a SDWA primacy agency, must implement a Capacity Development Strategy (Strategy) that addresses PWSs technical, managerial and financial (TMF) needs as defined here:

Technical capacity refers to a PWSs ability to operate and maintain water system infrastructure and includes elements such as source water adequacy, infrastructure condition and the technical knowledge of its operators.

Managerial capacity refers to a PWSs ability to properly administer water system operations and includes elements such as organizational structure, asset management programs, capital improvement planning, operator training, record keeping, customer service and an understanding of regulatory responsibilities.

Financial capacity refers to a PWSs ability to properly manage system financial obligations while generating sufficient reserve funds to maintain infrastructure and includes elements such as rate structure, budget preparation, collection services and credit worthiness.

This Capacity Development report identifies accomplishments during the period of July 1st, 2016 – June 30th, 2017, as well as provides information on effectiveness of the components of the DPH's Capacity Development Strategy. The DPH submitted the state's initial Strategy to the EPA Region 1 on August 4th, 2000 and became the first state in New England to have an accepted Strategy on December 1st, 2000. The Strategy consolidates the DWS's programmatic activities into cohesive and consistent efforts and focuses on the proactive protection of public health by attempting to identify and prevent PWS capacity weaknesses before formal enforcement actions are required. In establishing the directive to support sustainable systems and to eliminate systems unable to sustain acceptable levels of capacity, the Strategy defines where resources can be effectively applied to achieve the best results. Capacity elements

presented in this report are the tools used by the DWS that together form the Strategy that is the foundation of the DPH's Capacity Development program.

The implementation of capacity development will remain consistent with Connecticut's current EPA approved Strategy. As circumstances warrant, the DPH will assess changes necessary to manage new matters as they arise to ensure the Department is responsive to emerging issues. Examples of such include the implementation of the new Ground Water Rule and the national focus on the implementation of the Lead and Copper Rule. Both of these efforts have led to increased training, outreach, and technical assistance efforts, of which will be discussed herein this report.

Capacity Development Accomplishments - July 1st, 2016 - June 30th, 2017

- ☑ The Drinking Water Section (DWS) effectively regulated and protected public health at five hundred and thirty-five (517) CWSs, five hundred and thirty-four (527) NTNC systems, and one thousand four hundred and forty-seven (1,447) TNC systems.

- ☑ Ninety-nine (99) new PWSs were added in the July 1st, 2014 to June 30th, 2017 time period. Seventeen (17) systems; two CWSs, two NTNC PWSs and thirteen (13) TNC systems, were constructed through the Certificate of Public Convenience and Necessity (CPCN) review process. These seventeen (17) systems are highlighted in green in 'Appendix B – Listing of New Systems'. The other eighty-two (82) systems were newly 'discovered' systems. One (1) of the 'new' systems; a CWS, scored eleven (11) or more on the EPA's ETT system enforcement criteria. This system is highlighted in red in 'Appendix B – Listing of New Systems'.

- ☑ The DWS Enforcement Unit issued five (5) Notices of Violation with Civil Penalties, six (6) Consent Orders, and twenty-two (22) Administrative Orders.

- ☑ The Federal Government Performance Results Act (GPRA) indicates that Connecticut ranks twenty-second (22nd) out of sixty–six (66) primacy agencies in percentage of population served by CWSs that meets applicable health based drinking water standards, effective treatment, and source protection. Connecticut ranks twenty fifth (25th) in the percentage of person months that CWSs provide drinking water that meets applicable health-based standards and fifteenth (15th) in the percentage of CWSs that provide drinking water that meets applicable health-based standards, effective treatment, and source protection.

- ☑ Five hundred eighty four (584) sanitary surveys were conducted. The systems included twenty-four (24) subpart H systems, one hundred fifty-six (156) CWSs, one hundred thirty-two (132) NTNC systems, and two hundred seventy-two (272) TNC systems.

- ☑ Seventy-two (72) water companies comprised of two hundred and fourteen (214) separate, individual CWSs submit water supply plans. Each company's plan has been updated and approved by the state agencies since the original legislation passed in 1985. Seven (7) of these companies have updated their individual plans in the past year. Technical worksheets were developed to help ensure that future water supply plans

report and accurately capture system safe yield, available water, and margin of safety. The worksheets are intended to help water companies and their consultants understand the regulations and generate water system capacity values that are logical and reliable.

☑ Four (4) Sale of Excess Water (SEW) permit applications were reviewed for sales of bulk water from one public water system to a neighboring public water system. Four (4) SEW permits were granted to the water companies that met the regulatory requirements.

☑ CGS section 25-33q requires the DPH Commissioner to prepare a High Quality Source (HQS) List to ensure that the highest quality source waters are available to provide water for human consumption. The list must be updated annually. CGS section 16-27a further requires that any revisions made to the State Conservation and Development (C & D) plans must provide consideration to the DPH's HQS list. The initial list was prepared in consultation with the state's Water Planning Council. The first annual update to the High Quality Source list was published on January 26th, 2015. The list is instrumental in helping to preserve the state's highest quality source waters for human consumption. The list also helps to protect the adequacy of public water systems in the classification process that is being utilized to implement Connecticut's new stream flow standards.

☑ The Drinking Water State Revolving Fund (DWSRF) Program continued to provide funding for important infrastructure projects resulting in both a high pace level and further reduction in unliquidated obligations (ULOs).

☑ The DWSRF Emergency Power Generator Program that was instituted in 2012 continues to provide much needed funding to CWSs for emergency power. During State Fiscal Year (SFY) 2017, four (4) more funding agreements were executed for generator system installations under the program.

☑ A total of seventy-seven (77) DWSRF Project Eligibility Applications were received for funding that totaled more than $205,000,000 in requests. Almost $200 million of the requests were deemed to be eligible projects.

☑ DWS was able to take advantage of $20 million in state funds appropriated initially through Public Act 14-98 to be used for PWS infrastructure projects aimed at consolidating or interconnecting CWS and public schools that are a PWS. The entire $20 million of available funding under this program was allocated by the State Bond Commission in May 2017 for two specific projects for Groton Utilities and Norwich Public Utilities that have been determined to satisfy the eligibility criteria resulting in a total of 7 new PWS emergency interconnections.

☑ All thirty-two 2015 Drinking Water Infrastructure Needs Survey and Assessment (DWINSA) Questionnaires were submitted at the beginning of the reporting period. The 2011 DWINSA results indicated $3.58 billion of drinking water infrastructure needs for Connecticut in the twenty (20) year period ending in 2030. The results of the 2015 DWINSA have not yet been released; however, it is expected drinking water infrastructure needs for Connecticut will increase.

- ☑ The Operator Certification program ensured that the five hundred and sixteen (516) CWSs and five hundred and twenty-seven (527) NTNC public water systems in Connecticut had certified operators. Violations were issued to ten (10) CWSs and seven (7) NTNC systems for the failure to have a certified operator.

- ☑ The Operator Certification program reviewed and approved 168 relevant courses for certified water system operators providing a sum total of 999.0 training contact hours available for operators to meet their continuing education requirements. Reviewing external training courses and providers ensures training is relevant to the field work of certified operators and courses are conducted by qualified instructors and administered responsibly.

- ☑ Utilized federally contracted capacity development resources such as financial assistance regarding available funding opportunities and capital improvement planning through the Environmental Finance Center (EFC), technical and asset management assistance to small CWS from Resources for Communities and People (RCAP) to provide specific capacity development assistance for prioritized PWS and for certified operator training courses through Atlantic States Rural Water and Wastewater Association.

- ☑ Two (2) new take-over proceedings for two (2) CWSs were initiated. A total of 5 takeover cases are currently under joint review by DPH and the Public Utilities Regulatory Authority (PURA). DWS is working with PURA to streamline the current water system takeover process. This streamlining will assist with transferring system ownership quicker for small failing community public water systems.

- ☑ New regulations for all CWSs requiring emergency contingency response plans and emergency power provisions at all critical facilities were passed on December 15, 2015; implementation of the new regulation began in FY17 due to the phased in timetables requiring compliance by December 17, 2016 for CWS serving ≥ 100,000 people, by December 17, 2017 for CWS serving 10,000 – 99,999 people and by December 17, 2018 for CWS serving < 10,000 people.

- ☑ Maintained Partnership with Resources for Communities and People (RCAP) Solutions, a nonprofit community development organization, to provide onsite technical assistance and training to small communities and systems on funding, financing, and asset management of drinking water systems. This contract was initially executed in November 2014 and will continue through September 2018.

- ☑ The DWS entered into an MOA with the University of Connecticut, Connecticut Institute for Resilience and Climate Adaptation (CIRCA) on December 20, 2016, to conduct the research and work necessary to assess, identify and address vulnerabilities for community water systems in Fairfield, New Haven, New London and Middlesex counties and prepare a plan to ensure preparedness and resiliency before, during and after future storms and hazards, such as drought and climate change.

- ☑ The Western, Central Corridor and Eastern Water Utility Coordinating Committees (WUCCs) identified public water system capacity as a point of focus and need. WUCC members and DWS staff analyzed potential planning initiatives to improve the long-term viability of these systems.

- ☑ DWS staff conducted 9 small CWS capacity interviews to gather information on the difficulties of owning and operating a small PWS in an effort to assist these systems.

- ☑ The DWS dedicated resources to the development of the State Water Plan which is currently in draft form. The State Water Plan is a repository for sound, scientific data and policy recommendations which will inform decision making in the overall management, planning, and technical capacity building strategies necessary for consideration in maintaining and preserving sound practices to ensure public water systems preserve and improve water supplies and protections for the highest quality drinking water throughout the state now and into the future.

- ☑ DWS created an internal Drought Workgroup comprised of staff from several DWS functional units with a focus on consistent drought trigger development, and creation of a more robust reservoir capacity and groundwater level monitoring program including reporting and trending mechanisms to aid in early identification of potential water supply capacity issues for PWS.

- ☑ DWS created an internal Lead Team comprised of staff from all units to work on revising protocols, conducting LCR education and outreach for PWS owners and operators, and implement the LCR.

- ☑ Approximately sixty-five (65) engineering projects such as water treatment plant upgrades, water storage tanks, pump stations, and transmission mains were reviewed and approved. Guidance manuals and recommended procedures were also produced and updated as necessary to assist PWSs and their contracted consultants in preparing design plans and specifications that meet state and federal regulations.

- ☑ The standard practice of drafting DWS Circular Letters for important drinking water issues was continued to promote more awareness and inclusiveness of all water stakeholders. Fifteen (15) circular letters were sent during the July 1, 2016 to June 30, 2017 reporting period.

- ☑ The DPH, as a member of the Water Planning Council, participated in the development and drafting of the State's first State Water Plan. Plan was drafted pursuant to state law requirements working with a broad based group of stakeholders. The Plan was drafted by June 30, 2017 and out for public comment and finalization by the end of 2017. The Draft Plan included the issues of aging water supply infrastructure and the numerous small community systems as challenges ahead that need to be addressed.

Capacity Development New Systems Program – Annual Reporting Data

Connecticut is required by the federal SDWA to have the authority to implement a program that assesses the TMF capacity of all new CWS and NTNC systems. The DPH's Strategy includes mechanisms to prevent the proliferation of new small PWSs by requiring new systems to obtain a Certificate of Public Convenience and Necessity (CPCN) pursuant to CGS section 16-262m prior to construction. The CPCN regulatory review process requires that prospective new systems must first evaluate feasible interconnection with existing PWSs. If such interconnections are not feasible, the CPCN regulations establish minimum design standards for new water systems and require new systems to demonstrate acceptable levels of TMF capacity prior to the issuance of a CPCN. The CPCN regulatory review process is conducted by the DPH. When a designated Exclusive Service Area (ESA) provider exists, the CPCN process requires a designated ESA provider to own any new CWS system created in the approved service area. The ownership of CWSs ensures additional financial, managerial, and technical capacity and a larger customer base to support and finance satellite system operations.

The DPH recognizes that early identification of potential new systems is critical. To achieve success requires coordination and involvement at the local community level. Local planning and zoning agencies, regional planning organizations and local health departments (LHD)s play a critical role in identifying potential new PWS. The DPH continues to hold or participate in educational forums to help local authorities understand the CPCN requirement and refer developers to the DPH and/or the PURA for a CPCN determination before any local permits are issued for a project. Local health departments use forms developed by the DWS to screen development projects to determine if a CPCN may be required. Local controls are essential to an effective new systems program. Pursuant to CGS section 8-25a; municipalities are responsible for the operation of any new water company that is created without a CPCN, except a water company supplying more than two hundred fifty service connections or one thousand persons, if that new water company is at any time unable or unwilling to provide adequate water service.

Section 25-33i of the Connecticut General Statutes states that no public water supply system may be approved within a public water supply management area after the Commissioner of Public Health has convened a water utility coordinating committee unless: (1) an existing public water supply system is unable to provide water service or (2) the committee recommends such approval. The Department of Public Health provides CPCN applications to the WUCC regions for review and potential action. The statutes and regulations are silent as to the specific procedures of WUCC approval, leaving it up to the individual WUCCs as to how to process, review, and act on an application, including when in the CPCN process the WUCC takes action. The WUCCs, in practice, evaluate each submission and consider it against local and regional development and water supply availability to determine the best long-term viable water supply for the proposal.

The following section addresses required reporting criteria in the recommended report format:

1. ***Has the State's legal authority (statutes/regulations) to implement the New Systems Program changed in the previous reporting year? If, so, please explain and identify how this has affected or impacted the implementation of the New Systems Program. Documentation, including an Attorney General (AG) statement or a statement from a delegated department attorney, may be required. If not, no additional information on legal authority is necessary.***

Answer: Public Act No. 16-197 was signed on June 7, 2016 and became effective on October 1, 2016. DPH initiated this Act which expedites the review of an application for a certificate of public convenience and necessity (CPCN). A CPCN is required for the construction and expansion of public water systems. DPH's review of a CPCN involves an evaluation of the safety and adequacy of the source of water supply and that construction meets engineering guidelines. Under P.A 16-197, the DPH reviews CPCN applications and issue CPCNs for community (residential) water systems as is currently done for non-community (non-residential) water systems. For those systems that are regulated by the Public Utilities Regulatory Authority (PURA) or when ownership is not being assigned to an exclusive service area provider pursuant to C.G.S. section 25-33g, PURA will conduct the financial capacity review of the proposed system. Under the old statute, DPH and PURA jointly reviewed CPCN applications and issued CPCNs for community water systems. The new process has reduced redundancies in the CPCN process by ensuring there is no duplication of efforts between the two agencies.

2. ***Have there been any modifications to the States' control points? If so, describe the modifications and any impacts these modifications have had on the implementation of the New Systems program. If not, no additional information on control points is necessary.***

Answer: There have been no formal modifications to the State's control points, however, as discussed in Item #1 above, the DWS continues to work to strengthen its ability to minimize the creation of new PWS, as well as streamline the process to make it easier for new PWS to understand and therefore comply.

3. ***List new systems (PWSID & Name) in the State within the past three years, and indicate whether those systems have been on any of the annual Enforcement Targeting Tool (ETT) lists (as generated annually by EPA's Office of Enforcement and Compliance Assurance).***

Answer: Appendix B fulfills the federal requirement by listing the ninety-nine (99) new systems with associated PWSID's that were added to the state's public water system inventory during the July 1st, 2014 to June 30th, 2017 time period. Seventeen (17) systems; two CWSs , two NTNC PWS and thirteen (13) TNC systems, were constructed through the Certificate of Public Convenience and Necessity (CPCN) review process. Each of these seventeen (17) received a comprehensive TMF capacity evaluation. The systems constructed through the CPCN process are highlighted in green in 'Appendix B – Listing of New Systems'.

The other eighty-two (82) systems; two (2) CWSs, nineteen (19) NTNC and sixty-one (61) TNC systems, existed and, in instances, had been operating for years. Some commercial properties changed ownership and subsequently become PWSs when the new business operations expand

resulting in exceedance of population thresholds. Additionally, a few towns that joined an established health district instead of relying upon a part time health director were able to identify systems that were existing and which needed to be regulated. Each of the eighty-two (82) 'discovered' systems received the required regulatory compliance information upon their activation. This issue alone requires a significant amount of staff time and will be reviewed in order to streamline this process and work closely with LHDs to address new system creation.

The Drinking Water Section (DWS) uses the EPA's Enforcement Targeting Tool (ETT) point-based system to identify compliance problems. Any PWS that scores eleven (11) or more points is prioritized for enforcement actions under the EPA's Enforcement Response Policy. Zero (0) newly constructed systems and just one (1) of the newly 'discovered' systems scored eleven (11) or higher on the EPA's ETT criteria for formal enforcement. Each of the three (3) system's scores was attributed to Monitoring & Reporting (M & R) violations. The three (3) systems are highlighted in red in 'Appendix B – Listing of New Systems'.

Capacity Development Strategy Implementation – Existing Systems

The functional elements of the DWS work in concert to provide an effective means of not only regulating drinking water, but in providing the structure for improved drinking water system sustainability. The Strategy includes mechanisms to ensure that existing PWSs remain sustainable and capable to deliver a safe and adequate supply of water to customers now and into the future. The Strategy promotes consolidation of small systems with large systems to achieve an economy of scale for the water rates that will be required to maintain long-term infrastructure sustainability. Small systems have difficulties now meeting existing compliance, operations and infrastructure maintenance costs let alone costs for future new regulations that will be faced. If consolidation is not feasible or desired, the Strategy includes mechanisms to assist small systems with compliance and sustainability through technical assistance, financial assistance, training and, when required, formal enforcement and/or take-over proceedings.

The following section addresses required reporting criteria in the recommended report format:

1. ***In referencing the State's approved existing systems strategy, which programs, tools, and/or activities were used, and how did each assist existing PWS's in acquiring and maintaining TMF capacity? Discuss the target audience these activities have been directed towards.***

Answer: All of the DWS functional units, programs, tools and activities work together to assist public water systems with technical, managerial and financial capacity as is evidenced in the Capacity Development Accomplishments listed above. In addition, DWS has worked to increase partnerships and training opportunities to build increased capacity for PWS in the traditionally less regulated area of financial capacity.

The Strategy strengthens the TMF capacity of PWSs by identifying and correcting weaknesses early through close regulatory oversight, assistance and enforcement. The DWS functional units work closely together. A comprehensive review of a PWS's performance is evaluated when isolated compliance problems are discovered. This process helps to identify and correct the root causes of compliance problems before more serious problems develop. Long term

sustainability of PWSs is the Strategy's main objective. The Strategy has worked well in Connecticut and is consistent with EPA's Sustainability Policy released in 2010.

2. Based on the existing system strategy, how has the State continued to identify systems in need of capacity development assistance?

Answer: Several "triggers" are used to identify and prioritize existing PWSs that need capacity development assistance.

Trigger #1 Water Quality Compliance Data: DWS identifies systems in need of capacity development assistance by the system's ability to respond to the compliance requirements for prescribed regulations and to report this compliance data to the DWS. Compliance data is managed in the Safe Drinking Water Information System (SDWIS) and compliance determinations are run on a continual basis. In addition, the Rule Implementation Unit has created publicly available water quality monitoring and compliance schedules for each individual PWS in compliance with applicable federal rules and state regulations. Examples of data that may identify a system in need of assistance would include MCL violations, M&R violations and Treatment Technique (TT) violations among others. Greater than one monitoring and reporting violation in a 12-month period is used as a trigger of possible deficiencies in managerial and possibly financial capacity and technical assistance and/or formal enforcement actions are initiated. This approach attempts to avoid systems from being placed on the ETT list. Systems that are, or become placed on the ETT list are given priority technical assistance consistent with Connecticut's existing Strategy.

Trigger #2 Sanitary Survey Data: Another mechanism used is the sanitary survey process and the resulting compliance determinations. During a sanitary survey the physical infrastructure of the water system is assessed to determine if there are significant violations or deficiencies that could present long and/or short term sustainability problems. For most community water systems much of their water system assets are buried (i.e. distribution and transmission water mains) and cannot be inspected during sanitary surveys. The DWS has incorporated many additional question sets into the sanitary survey process to determine if systems are adequately employing sustainability concepts. The small system capacity assessment tool (CAT) has also been incorporated into the sanitary survey process preliminarily by assigning small CWS that scored in the red to be assigned to more experienced engineers who can provide specialized technical assistance during the survey. Sanitary surveys are conducted at least every three (3) years for CWSs and every five (5) years for NTNC and TNC systems.

Trigger #3 Other PWS data: The PWS capacity needs can also be realized through many different types of interactions that provide data to the DWS. Lack of a certified operator or operators with large amounts of violations cited at the systems they operate, water service interruptions resulting in frequent outages or bulk water hauling, cross-connection issues and/or customer complaints can help raise capacity issues to the surface resulting in prioritization for technical assistance or formal enforcement actions.

Trigger #4 Capacity Review as part of the DWSRF Program: All PWS that apply for DWSRF funding must demonstrate adequate TMF capacity in order to obtain a loan. Reviews of financial qualification are conducted by the OTT and, if the PWS is a privately owned rate-

regulated utility, by the PURA. Technical and managerial reviews are performed by the DWS and include a historical review of regulatory compliance as well as infrastructure deficiencies that were identified during the most recent sanitary survey. Any financial issues that are identified must be corrected before a PWS is qualified to receive a loan. Any technical or managerial violations that are identified must be addressed either prior to receiving a loan or as part of the project that receives a loan. Since 2011, the DWSRF Program has placed additional incentives for PWS to enhance TMF capacity through asset management (AM) planning. PWS with existing AM plans are provided additional priority points in the priority ranking system to increase project(s) ranking on the DWSRF Project Priority Lists. In 2013, the DWSRF Program provided incentives for small PWS to implement AM plans by offering an additional 10% subsidization towards project(s) if systems had existing AM plans or would undertake AM planning as part of the project(s).

3. During the reporting period, if statewide PWS capacity concerns or capacity development needs (TMF) have been identified, what was the State's approach in offering and/or providing assistance?

Answer: DWS continued to use concepts and tools identified in the Strategy to help PWS of all classifications increase their technical, managerial and financial capacity. Examples of these include routine sanitary surveys, water quality data, monitoring and reporting compliance data, operator certification, source water protection and permitting, engineering reviews of new treatment and PWS infrastructure projects, and individual technical assistance meetings. The DWS also uses the website to provide a broad range of information to public water systems to assist in achieving compliance and provide access to important information.

Since the storms in 2011 and 2012 that greatly impacted our small community PWS, a large portion of the technical assistance and capacity development initiatives/outreach have been geared toward smaller community systems. A copy of the Three Storm Strategy prepared by DWS is included as Appendix C for reference. Some of the initiatives that came about after the storms were the passage of regulations for Emergency Power provisions at all CWS, convening of the WUCC statewide, development of Asset Management Regulations, a technical assistance contract with RCAP Solutions to provide financial capacity assistance and $20 million in state bond funding to be reinvested in small CWS consolidation or interconnection projects. In addition, two new focus groups were created within DWS last year to respond to critical issues facing public water systems in order to provide a consistent and proactive approach to developing capacity for PWS in these areas: the Drought Workgroup and the Lead Team.

Emergency Power and Emergency Contingency and Response Plan Regulation: RCSA Section 19-13-B102 was amended in December of 2015 to require emergency power provisions for all critical facilities and emergency contingency and response plans at all CWS. This directly relates to their technical and managerial capacity of the PWS and provides resiliency. All CWS were required to report any existing emergency generators and have their emergency contingency and response plans to the DWS by August 2016. Technical Review and Field Assessment Unit staff has updated the sanitary survey checklist to include the response plan and emergency power questions. Additionally, the DWSRF Unit continues its generator program that subsidizes the cost of new permanent generators at CWS and not for profit NTNC PWS totaling approximately 45 generators that have been installed at small CWS to date.

WUCC: The WUCCs have identified small community public water systems as needing significant capacity development assistance to combat some common problems such as uncoordinated planning among PWSs, competition between PWSs for expansion of service areas, increasing regulatory requirements, aging and substandard infrastructure, inadequate source protection, difficulty in developing new water sources, inadequate financing, poor management, and a significant lack of adequate communication between water companies and with local elected officials of the communities serviced. The WUCC process aims to tackle those issues. The following are excerpts from the Coordinated Water System Plan Part I: Final Water Supply Assessment Western Connecticut Public Water Supply Management Area, dated December 12, 2016. The Western, Central and Eastern assessment reports are all available on the DWS website.

" Operational requirements such as regulatory permitting, technical assessment, system maintenance, infrastructure replacement, and water supply need require a disproportionate amount of time and money compared to the operation of a larger system. In particular, the lack of proper planning and/or asset management planning for many small CWSs (particularly a lack of knowledge regarding the full cost of providing a safe and reliable supply of drinking water) has resulted in systems with limited financial capacity to address public health code issues. "

".....the operation of small water systems immediately adjacent to larger systems can result in a disparity of the cost of water among populations in close proximity, especially when small systems fail to fully fund their water system operations. The cost of interconnecting small systems can be prohibitive or at the very least a disincentive. More fully understanding the technical, managerial, and financial capacity of small systems to provide water supply is of interest."

Asset Management Regulations:

The DPH submitted a 2017 legislative proposal to require fiscal and asset management plans be produced by the state's community water companies serving 10,000 or less. While this legislative proposal had overwhelming legislative support, it did not pass in 2017. The DPH will propose it again in the 2018 legislative session.

Asset Management Assistance Contract:

The DPH continued its work with contractor RCAP Solutions, which has worked with approximately 20 individual PWS to develop the beginning of an asset management plan by conducting an in-depth asset inventory, populating the inventory data in the Check-Up Program for Small Systems (CUPSS) software, and outlining the basic asset management plan. In addition, approximately 35 different small community public water systems owners and operators attended each of the three trainings RCAP Solutions conducted under the executed contract with the DPH. These trainings emphasized asset management and how it relates to effective utility management for small community public drinking water system operations and maintenance, capital improvement planning and the relation to emergency response. Asset management is a key principle in achieving sustainable infrastructure within a PWS, and as such is the primary focus of this contract. Small PWS' are in great need of asset management technical assistance to aid in minimizing ownership and operational costs of drinking water infrastructure assets and to plan for maintenance or replacement before failure. RCAP Solutions is currently developing a financial rate setting workshop to offer to Connecticut small

systems to further assist them in their financial capacity.

Drinking Water Vulnerability Assessment and Resilience Plan

The DPH DWS applied for and received federal funding from the CDBG-DR administered by the Connecticut DOH, to help prepare a Drinking Water Vulnerability Assessment and Resilience Plan (DWVAR Plan). The DWS executed an MOA with the University of Connecticut, Connecticut Institute for Resilience and Climate Adaptation (CIRCA) on December 20, 2016 to conduct the research and work necessary to assess, identify and address vulnerabilities for community water systems in Fairfield, New Haven, New London and Middlesex counties and prepare a plan to ensure preparedness and resiliency before, during and after future storms and hazards, such as drought and climate change.

State Bond Funding: In May of 2014 Public Act 14-98 was enacted which appropriated $50 million in state funds for a Public Water System Improvement Program that will be used to provide supplemental grants-in-aid, in the form of principal forgiveness, to PWS that receive DWSRF loans for certain eligible projects. During the Spring 2016 legislative session, this amount was reduced to $20 million and was to be used for projects aimed at consolidating or interconnecting CWS and public schools that are a PWS. The entire $20 million of available funding under this program was allocated by the State Bond Commission in May 2017 for two specific projects for Groton Utilities and Norwich Public Utilities that have been determined to satisfy the eligibility criteria resulting in a total of 7 new PWS emergency interconnections.

Drought Workgroup: Last year CT weathered a severe drought that saw many large CWS working diligently to bridge gaps with rapidly diminishing available water supplies and now compliance data is showing an increase in Stage 2 disinfection by-product (DBP) levels, possibly as a result of reduced distribution flushing activities. The workgroup also created reservoir capacity and groundwater level reporting forms and instituted a mechanism to report each to DWS weekly.

Lead Team: Following the events in Flint MI, the DWS created an internal "Lead Team" comprised of staff from all units to work on revising protocols, conducting LCR education and outreach and implement the LCR. To date, the Lead Team has produced five educational circular letters concerning lead, conducted six public presentations on the LCR including a full day LCR refresher course for operators, created a corrosivity potential assessment to be incorporated during the review and approval of new sources of supply. Additionally, a policy of issuing Administrative Orders to all PWS that incur a Lead Exceedance was enacted that require shorter compliance schedules for public notification, lead public education requirements, submittal of corrosion control treatment proposals and installation of treatment. Approximately 50 Administrative Orders have been issued by the DWS since this policy was enacted.

4. If the State performed a review of implementation of the existing systems strategy during the previous year, discuss the review and how findings have been or may be addressed.

Answer: No formal review was conducted of the existing systems strategy during the previous year, however, the DWS Capacity Development Strategy will be reviewed in FY18 with a revised strategy anticipated to be submitted to EPA in the Fall of 2018.

5. Did the State make any modifications to the existing system strategy? If so, describe.

Answer: There have been no formal modifications to the core tenants of the existing system strategy, however as you can see in the actions taken this past fiscal year, DWS is adaptable and shifts its resources accordingly to develop a consistent and proactive approach to emerging issues within the water industry that can affect a PWS's TMF capacity.

The DWS will be working in the coming year to prepare a revised Strategy to provide to the EPA Region 1 for review and comment in late calendar year 2018. A significant factor moving forward with capacity development in Connecticut is an increased public awareness and a greater understanding of the challenges that face the state's public water suppliers. On-going capacity development efforts, minimum stream flow release standards, and the University of Connecticut's high-profile search for supplemental supply have helped to raise the interest of water resource constituency groups and the public at large. Large CWSs will be provided an excellent opportunity to address the serious challenge of maintaining adequate supplies and complying with the state's new minimum stream flow release standards during the completion of the WUCC planning process.

Completing the WUCC planning process will provide a framework for assisting Connecticut's many small CWSs. The DWS continues to utilize a small system capacity assessment concept. A baseline capacity assessment tool (CAT) has been completed for CWSs that serve less than one thousand (1,000) persons. The baseline CAT is a hands-on, system specific evaluation of a small CWSs TMF capability. The baseline CATs identify specific TMF developmental needs for small CWSs. Direct assistance, on a priority basis dependent on system score, will be provided to help receptive water systems implement the CAT recommendations. The systems with the lowest scores will be prioritized for additional capacity development assistance from the DPH and/or a qualified entity that may be contracted to provide the assistance. Capacity development progress can then be effectively measured every three (3) years moving forward in conjunction with the required system sanitary surveys. The baseline CAT has been integrated into the WUCC water supply assessments in all three WUCCs as well as the ongoing coastal resiliency study being conducted by UConn/CIRCA.

DWS Capacity Development Support Functions

The following DWS functional units and other Engineering and Regulatory initiatives work in concert with the triggers discussed above to support the Strategy always with the goal of creating sustainable PWS that provide safe and adequate drinking water while establishing short and long term operational strategies to meet and maintain their regulatory responsibilities.

Safe Drinking Water Rule Implementation Unit

The DWS Safe Drinking Water Rule Implementation (SDWRI) Unit closely monitors regulatory compliance through the Safe Drinking Water Information System (SDWIS) database. The Safe Drinking Water Rule Implementation Unit is critical to the state's capacity development efforts through the coordination, operation, management and maintenance of the various databases and related activities described below:

SDWIS Maintenance - SDWIS is used to enforce the federally mandated Safe Drinking Water Act and as such is the sole database of record for the state's drinking water regulatory information. SDWIS maintains inventory, water quality, violations, enforcement, and allows a standardized reporting format for PWS information. Software will be updated as needed as new drinking water rules and regulations are promulgated. Routine upgrades ensure continued viability of business and efficiently manages new regulations which may impact public health protection.

Public Water System Compliance Schedules and Monitoring and Sampling Plans – The unit develops and maintains sampling, monitoring and operating schedules for all PWSs in compliance with applicable federal rules and state regulations. Staff oversees the review and approval of all monitoring and sampling plans that are submitted in compliance with federal or state mandates. The unit also tracks compliance with all applicable monitoring and reporting requirements and follow-up with deficient systems. A schedule for every PWS is publicly available on the DWS website for reference and transparency.

Compliance Assistance Database - SDWIS is supplemented with an internally developed Compliance Assistance Database (DWSCAD) that provides support to all DWS functional units to implement safe drinking water rules, track engineering project reviews, water supply plan reviews, sanitary surveys, DWSRF projects, cross-connection control program requirements, certificate projects, and watershed surveys among other elements. DWSCAD has been designed to provide a multitude of reports. Examples of weekly reports to staff include tracking staff progress of core duties such as completion of sanitary surveys and resolution of significant deficiencies, quick identification and notification of water quality data has been received that is above or approaching regulatory limits, and batch verification and tracking of compliance schedules and associated enforcement actions.

Technical Review & Field Assessment/Capacity Development Units

The DWS Technical Review & Field Assessment (TRFA) Unit, and the DWS Capacity Development (CD) Unit for transient non-community systems, conduct routine sanitary surveys every three (3) years for CWS and every five (5) years for NTNC and TNC systems to assess the compliance and capacity of the state's PWSs. Additionally, Water Supply Plans are reviewed (if applicable) during the survey process and engineering reviews of DWS infrastructure projects are conducted by the staff of the two units as projects are received.

Sanitary Surveys - During a sanitary survey the physical condition of the water system infrastructure is assessed, records of regulatory compliance are reviewed, and information is gathered regarding the managerial and financial health of the system. Field engineers provide technical assistance to system owners and operators during the survey and issue a formal sanitary survey report to the owner that identifies any significant deficiencies, regulatory violations, and recommendations for improved operations. The system must submit a corrective action plan that addresses significant deficiencies and/or regulatory violations cited in the sanitary survey report. Field engineers have been instructed to triage significant TMF weaknesses identified during a survey to more appropriate DWS programs or staff for follow-up assistance. Triaging can include financial assistance from the DWSRF when significant infrastructure improvements are required, for example. Other additional non-routine sanitary surveys are conducted when regulatory compliance and/or other problems such as water quality violations, security incidents or customer complaints are encountered. Face to face

interaction is critical to building a strong working relationship between the regulatory agency and the regulated community and provides additional opportunities to observe the physical condition of water system components to understand how the water system operates and observe potential capacity weaknesses. The staffs of both units also provide general technical assistance, handle consumer complaints, and respond to any reported security and emergency incidents.

Water Supply Plans - Seventy-two (72) water companies that serve more than 1,000 people must submit individual WSPs to the DPH, DEEP, the Office of Policy and Management (OPM) and regional planning agencies every six to nine years. The every nine year submittal requirement is granted only to systems that meet all water quality and quantity obligations mandated by Federal and State regulations including maintaining a minimum adequate margin of safety and acquiring Sale of Excess Water (SEW) permits for bulk water sales to another water company. The seventy-two (72) water companies that are required to submit plans are made up of two hundred and fourteen (214) distinct, individual CWSs. Many water companies have multiple distinct divisions addressed within their individual plan. Water supply plans are a generally unrecognized element of the DPH's program. Thirty-seven percent (37%) of the state's CWSs are provided TMF capacity element reviews that are part and parcel of water supply planning review process. Small satellite CWSs that are owned by large water companies are also included in the water supply planning process.

Since the water supply planning regulations were passed in 1985 each individual water company's water supply plan has been approved multiple times by the state agencies. To ensure that future water supply plans are reporting and capturing accurately the systems' safe yield, available water and margin of safety; worksheets were developed and are now being utilized to assist the systems in understanding the regulations and generating system capacity values that are logical and reliable. Moving forward, the DWS will continue to explore how to best use the information included in the individual water supply plans to support SDWIS data, as well as tie the information to the sanitary survey and WUCC processes. The DWS also reviews any agreements between CWSs that involve the SEW to ensure that the sales will not have adverse impact on the seller's available water for consumers.

Enforcement Unit - Compliance with State and Federal Regulations

The Enforcement Unit is responsible for issuing violations of state and federal drinking water regulations related to failure to monitor or report water quality test results. The systems that get to the point of enforcement are most likely systems that do not practice infrastructure replacement and have not responded proactively to technical assistance from other DWS functional units.

EPA's Enforcement Targeting Tool (ETT) - The Enforcement Unit's role in ensuring safe and adequate public water supplies that maintain adequate capacity now and into the future is assisted by the ETT. The ETT is the primary enforcement mechanism used to identify PWSs that have capacity development problems and ensures that PWSs with significant regulatory compliance problems receive priority attention from primacy states and that formal enforcement proceedings are initiated if needed. A tiered enforcement approach is used in most cases to return systems to compliance with the first tier being providing technical assistance to the PWS to return them to compliance. If that fails then the issuance of a Notice

of Violation with Civil Penalties would occur. The second tier is a formal Consent Order that is a voluntary and binding agreement between the PWS and the DPH that establishes a plan and timetable to return to compliance. The third tier is a formal Administrative Order that orders non-voluntary compliance that can be appealed. In 2016 the Department enacted a policy of issuing Administrative Orders to all public water systems that incur a Lead Action Level Exceedance to ensure public health is protected. The Orders require shorter compliance schedules for public notification, lead public education requirements, submittal of corrosion control treatment proposals and installation of treatment. This program provides quarterly updates to the EPA on systems that have been identified as priority systems for enforcement by the ETT and works closely with this federal agency on all enforcement activities.

Drinking Water State Revolving Fund Unit

The Drinking Water State Revolving Fund (DWSRF) Unit assists community and non-profit, non-community PWSs in financing drinking water infrastructure improvement projects such as upgrades and renovations to water storage tanks, water treatment facilities, pump stations and water mains. Funding is provided as long-term, low-interest loans that can be repaid in terms of up to twenty (20) years with interest rates approximately half of the market rate.

DWSRF Program - The DWSRF is a competitive loan program, supported with annual capitalization grants awarded by the EPA, with a limited amount of funding available each state fiscal year (SFY) to meet the loan demand. Historically, the DWSRF Program receives more applications for funding then there are funds available. The DPH utilizes an established priority ranking system to determine which projects to direct the available funds to each year. The priority ranking system (PRS) is a point based system weighted most heavily towards projects that are required for public health protection and regulatory compliance. A minimum of 15% of the available funds are reserved for small PWS projects. The PRS recognizes and supports strong infrastructure sustainability programs that emphasize prevention as a capacity development tool to ensure long-term safe, adequate and affordable drinking water to Connecticut's residents.

DWSRF Emergency Power Generator Program - During the fall of 2011, Connecticut experienced two separate significant storm events that left over two hundred (200) small PWSs without power to operate their water systems for several days. Many small CWSs were on Boil Water Advisories as a result of losing power and water system pressure. As a direct result of the public health impact from these storms the DPH instituted a new DWSRF Emergency Power Generator Program to provide subsidized loans for the installation of emergency generators to provide back-up power for critical drinking water infrastructure during power outages. Under the program up to 45% of the cost of the generator system is subsidized. To assist these small PWSs, the DPH significantly streamlined traditional DWSRF environmental reviews, contract procurement requirements and legal expenses associated with loans for generator projects costing less than $100,000.

EPA Drinking Water Infrastructure Needs Survey - The DWSRF Unit facilitated the collection and preparation of information for the 2011 national Drinking Water Infrastructure Needs Survey conducted by the EPA which revealed that Connecticut needs to invest $3.58 billion over a 20 year period to meet the capital improvement needs for public drinking water infrastructure.

The DWSRF provides a low-cost financing approach to help meet these needs, playing a critical role in supporting the capacity development needs of PWS in Connecticut.

Source Assessment and Protection Unit

The DWS Source Assessment and Protection (SAP) Unit enforces state statutes and regulations and implements state policies that pertain specifically to the protection of public drinking water sources. Connecticut has approximately 4,000 surface and ground water drinking water supply sources that require protection and preservation. Important initiatives undertaken by the Source Assessment and Protection Unit include maintenance of the High Quality Source List, ongoing work with the Connecticut Source Water Collaborative and Geographic Information System (GIS) database.

High Quality Source (HQS) List - CGS section 25-33q requires "the Commissioner of Public Health ... shall prepare a list designating sources or potential sources of water that require protection so that highest quality waters are available to provide water for human consumption." A companion statute section 16-27a requires that State Conservation and Development Plans give consideration to the DPH Commissioner's HQS List and state water policies pursuant to CGS sections 22a-380 and 25-33c. Connecticut is fortunate to have safe and adequate public drinking water supplies. A unique public health protection involves protecting drinking water sources from wastewater and treated wastewater. Connecticut's historic drinking water protections minimize the risk of water supply catastrophes like the recent one in West Virginia owing chiefly to the state's prohibition of sewage and industrial discharges to public supplies and the use of highest quality source waters for human consumption. The mandate to prepare the Commissioner's HQS List and conduct and prepare updates for the list on at least an annual basis provide the framework required to integrate drinking water source protection, water supply planning, and safe and successful implementation of the new state stream flow standards. The first annual update for the HQS list was published on January 26th, 2015. The list is an instrumental tool to help preserve the use of the state's highest quality source water for drinking water and to protect the adequacy of public water systems supplies during the classification process to implement new state stream flow standards.

Source Water Collaborative – The SAP Unit facilitated the development of a statewide Source Water Collaborative. The Connecticut Source Water Collaborative develops and supports strategies to preserve, protect and maximize the conservation of the lakes, streams, rivers and aquifers used for drinking water and the land that protects and recharges these sources of water. Ensuring the high quality and sufficient quantity of our state's current and future drinking water resources not only serves public health but is essential for a vibrant economy and supports recreation, the environment and the complex, natural ecosystem with which they are interconnected.

Geographic Information System (GIS) - The unit maintains the DWS GIS database that is a central tool to ensure that information is readily available to those that need it. The GIS system supports capacity development as it provides important analysis and visualization of a large amount of data pertinent to PWS and is used daily by the Section's planners, engineers, and analysts.

Grants and Administration Management Unit

The DWS Grants and Administration (GA) Unit coordinates activities for the Section including grant management and progress reporting for required EPA program management reports and contract preparation related to technical assistance for PWS. The DWS relies heavily on the federal Public Water System Supervision (PWSS) grant and the DWSRF capitalization grants to fund program staff and activities. The PWSS grant funds support the DWS in its enforcement of the SDWA requirements, ensuring PWSs comply with the National Primary Drinking Water Regulations. DWSRF provides millions of dollars each year to finance important drinking water projects, as well as supports staff working on the DWS' capacity development support functions. Additionally, the Operator Certification and Cross Connection Control Program both fall under the GA Unit. The Unit assists the DWS in providing and developing communication activities and conducts general office functions to support the PWSS and DWSRF Programs.

Operator Certification - The Operator Certification program is accountable for DPH oversight of the qualifications of individuals who operate and maintain PWSs. This program ensures that all CWSs and NTNC PWSs are operated by qualified and skilled certified operators. Certifications are issued for treatment plant, distribution system, small water system operators, backflow prevention device testers, and cross connection survey inspectors based on criteria established in regulation. Certification applicants must meet a combination of education, experience and examination requirements to become certified pursuant to requirements specified in regulations that include provisions for renewal, reciprocity and enforcement. The Operator Certification program approves other operator training course providers, operator training course curriculum and coordinates any DWS outreach activities to certified operators. The DWS implemented an E-Licensure program which allows all licensure activities to be completed online. The certification database allows the DWS to monitor operator compliance as licensed professionals are essential to maintain the delivery of safe and adequate drinking water supply. When a CWS or NTNC system does not meet minimum operator certification requirements this is a trigger of capacity weakness. The program is drafting revised regulations that will further improve identification of capacity weakness in professional system operations.

Cross Connection Control - The program ensures that PWSs conduct inspections for cross connections and test backflow prevention devices. The intent is to prevent contamination of drinking water through the proactive identification of any improper connections to the drinking water distribution system and through testing the devices that restrict the backflow of contaminants. Systems that are unable to conduct programs demonstrate a lack of capacity to provide safe drinking water to the public. The DPH's regulations require the certification of Backflow Prevention Device Testers ("Testers") and cross connection survey inspectors ("Inspectors"). The program issues and renews certificates for backflow personnel and over 925 individuals have active DPH certificates as Testers/Inspectors. GA staff participates in the training for "Testers" and "Inspectors" and provides technical assistance as needed on this topic.

Take-Over Proceedings

Pursuant to CGS section 16-46(a), a water company may not cease operations, or unilaterally discontinue the provision of water service to customers, without the consent of both the Public Utilities Regulatory Authority ("PURA") and the Department of Public Health ("DPH") (collectively, "the Departments"). The statute requires the Departments, upon receipt of a

request to cease operations or discontinue service, to hold a hearing in accordance with the provisions of CGS sections 4-176e, 4-177, 4-177c and 4-180 and issue a final decision setting forth the actions that the water company shall take to ensure a continuous supply of potable water at adequate volume and pressures, in accordance with the procedures and criteria set forth in CGS sections 16-262n to 16-262q, inclusive. CGS section 16-262n(c) requires the Departments, whenever a request from a water company is filed pursuant to CGS section 16-46(a) or whenever a water company fails to comply with an order issued pursuant to CGS sections 16-11, 25-32, 25-33 or 25-34, to determine the actions that may be taken and the expenditures that may be required, including acquisition of the water company by a suitable public or private entity, to assure the availability and purity of water at adequate volume and pressure to the persons served by the water company at a reasonable cost. Once a proceeding has been conducted pursuant to CGS section 16-262n, upon a determination that the costs of improvements to and the acquisition of a water company are necessary and reasonable, CGS section 16-262o authorizes the Departments to order the acquisition of the water company by the most suitable public or private entity. The process is often referred to as a 'take-over' proceeding.

Standard Operating Procedure Preparation and Revision

The DPH was officially accredited by the National Public Health Accreditation Board (PHAB) on March 14, 2017. PHAB identified DPH's greatest strengths as having a strong commitment to health equity, engagement of partners, and its performance management system. To that end, a large focus has been put on agency Standard Operating Procedures (SOPs) as a metric. In the past, DWS has worked hard to create many SOPs and other related guidance materials to assist PWSs, certified operators and consultants in owning, operating and proposing new PWS in a manner that meets state and federal regulations as well as industry standards, in addition to ensuring consistency for DWS staff implementing the regulatory requirements. With the implementation of new federal rules such as the Groundwater Rule and the Revised Total Coliform Rule among others, the DWS compliance supervisors and lead engineers have been diligently working to update and/or create new SOPs to ensure consistency among DWS staff implementation as well as provide easy to understand directions for PWS and their employees to be used as a tool to increase technical and managerial capacity.

Security and Emergency Response

The DWS provides subject matter expertise during drinking water security and water related emergency response activities for the DPH and provides technical assistance to PWSs on security and emergency response related matters. Gathering and disseminating PWS data during an emergency continues to be a primary focus for DWS and is evidenced by the use of DPH and state emergency response tools: Everbridge and WebEOC.

Everbridge - The DPH currently utilizes an Everbridge emergency notification software/system that allows the DPH and the DWS to share information with local health departments, PWSs, local Chief Elected Officials and other stakeholder groups simultaneously. The network saves a tremendous amount of time getting important messages out to stakeholders rapidly during critical public health emergencies.

WebEOC - The DWS has taken steps to establish a Public Drinking Water board in Connecticut's WebEOC emergency notification software. The board will allow the state's CWS to report

operational status directly to the State Emergency Operations Center (EOC) during emergency incidents, allowing for direct communication of PWS needs such as fuel shortages for emergency generators, implementation or lifting of boil water advisories and drought triggers. Currently, the largest CWS are credentialed to begin using the WebEOC water board.

The DWS responds to events that range from E. coli contaminations to suspicious activities in and around drinking water infrastructure. A large scale example of DWS response activities are pre-storm and post-storm responses that included cautionary Boil Water Advisories to hundreds of small CWSs during Hurricane Irene and Super Storm Sandy. Such activities reveal how the DWS security and emergency response capabilities have evolved to include the technologies discussed above to quickly and effectively respond to the needs of the 2.9 million people in Connecticut that rely on public drinking water.

Outreach and Public Participation

The DWS makes extensive use of the DPH's website to provide timely information to public water systems, local health departments, the general public and other stakeholders. The website provides individual webpages for each major DWS program, activity and priority areas. The website includes routinely updated compliance schedules for public water systems and violation data is made available to local health departments. Forms, guidance documents, fact sheets and other drinking water information that assists PWSs with regulatory compliance are available on the website. The DWS has instituted a standard practice of drafting DWS Circular Letters for critical drinking water related issues. The letters are provided to a very large range of stakeholders to promote awareness and inclusiveness. The DPH Communications Office also issues press releases when critical public health information regarding drinking water needs to be provided to the public on a statewide basis. The DWS routinely provides drinking water subject area experts to various organizations to speak at conferences, seminars, workshops and other functions related to public drinking water throughout the state.

Capacity Development in Action

The DWS would like to highlight three case studies demonstrating how DWS functional units work together to prioritize and efficiently work to resolve capacity issues that either can or have demonstrated an impact to public health. The dynamic nature of the capacity development strategy is seen in the case studies presented below.

Capacity Development Case Study #1- Sprague Water & Sewer Authority

Sprague Water & Sewer Authority (SWSA) is a small CWS with approximately 450 service connections and an estimated population of 1,100 people. The SWSA has two certified operators who are responsible for both the water and sewer system, as well as stepping in to help the local public works department during events such as a snow storm. The town relies heavily on grants to fund utilities infrastructure projects, and can easily become overtaxed in the event of an emergency due to its limited resources.

Approximately 11 years ago, the SWSA first struggled with supply capacity issues which necessitated the development of a second wellfield that was identified to have radionuclides present, but was the best choice out of their limited options. DWS Engineers from the SAP and TRFA Units worked closely with SWSA during this time to develop the new wells and build a new treatment plant that included treatment as well as blending of sources to further reduce

radon and radionuclides to within acceptable levels. This technical assistance paid dividends and things were running smoothly for several years.

Recently, several triggers caused the system to be referred for capacity development assistance. The 2015 sanitary survey raised concerns over their financing infrastructure improvement projects as evidenced by one of the two atmospheric storage tanks with an abundance of patched leaks indicating that the tank is nearing the end of its useful service life. The tank is used for blending and is necessary to maintain compliance with water quality requirements. Secondly, a large main break occurred during 2016 that was unable to be located and taxed the sources of supply. During the stressful days that followed, TRFA engineers realized there are seven river crossings for water mains and that their distribution mapping was partially complete. Finally, with aid from a neighboring utility with more sophisticated leak detection equipment, crews were able to find and repair the main break which was wasting about 20,000 gallons per day. Lastly, around the same time as the main break, the SWSA conducted public notice for a combined uranium MCL that was later determined to be inaccurate and a result of faulty conversion of units by the laboratory, which resulted in a lack of confidence in the PWS.

Once the PWS was identified as needing capacity development assistance, several meetings were conducted with the SWSA board, operations staff and DWS management and engineering staff. The PWS was referred to RCAP, who is currently working to finalize an Asset Management Plan at no cost to the utility. With the completion of the Asset Management Plan, SWSA will be better poised to prioritize critical infrastructure projects to maintain service and increase consumer confidence. DWS also referred the laboratory to the DPH Laboratory Certification Program to follow up on the problems experienced during preparation of the radionuclide lab report. Finally, the DWSRF Unit has worked to facilitate an emergency interconnection for SWSA with a larger neighboring utility (Norwich Public Utilities) utilizing a portion of the $20 million of state bond funding that was allocated to provide supplemental grants-in-aid, in the form of principal forgiveness, to PWS that receive DWSRF loans for certain eligible projects. This emergency interconnection will provide much needed system redundancy for SWSA.

Capacity Development Case Study #2- Parkway School Lead Exceedance

Parkway School is a public school serving approximately 500 students in grades K- 5 located in Greenwich, CT that is supplied water by its own public water system. Parkway School had a Lead 90% Action Level Exceedance in the monitoring period of 1/1/2015 – 12/31/2015, putting a sensitive population of children at risk. DWS, in response to the crisis experienced in Flint, MI, had developed a Lead Team, to review and revise protocols to ensure full compliance with the federal Lead and Copper Rule (LCR), and provide quick response to mitigate any public health risks. The Lead Team is comprised of staff from several units within the DWS. It is this DWS Lead Team that has discussed and identified the work to be accomplished to address lead exceedances and high lead results.

Upon notification from the SDWRI Unit who processed and verified the exceedance, the Enforcement Unit issued an Administrative Order to the system that sets stricter timelines for issuance of lead consumer notice and lead public education. Prior to July 2017, systems had 48 hours to issue the lead consumer notice and lead education materials after learning of the results. Since July 2017, because of the WIIN Act, DWS requires systems to issue the lead education material within 24 hours of learning the exceedance. In addition, the administrative order required Parkway School to submit an Optimal Corrosion Control Treatment (OCCT) recommendation within 45 days of the date of the order.

Members of the Lead Team from Operator Certification, SDWRI and TRFA Units held in person compliance meetings with Parkway School administration and their certified operator to review the LCR requirements, enforcement milestones, OCCT requirements and guidance, proper sampling procedures, and other related technical assistance. As a result of the compliance meeting with Parkway School, the school hired a contract certified water operator to help provide guidance to their facilities department, developed a revised sampling site plan, and also submitted an OCCT modification to increase the pH of the existing corrosion control treatment to achieve optimal corrosion control. After much technical assistance, DWS accepted the proposal and installation of the new treatment configuration was completed in November 2016. The school has been maintaining the acceptable pH range and has not had another exceedance since the OCCT modification was put into service. The cross-cutting Lead Team was able to quickly respond to and resolve the capacity issues identified, including lack of maintenance for the existing treatment system, lack of certified operator knowledge of the LCR and water quality compliance issues.

Capacity Development Case Study #3- Lake Hills Village Condominiums

Located on the banks of Chestnut Hill Reservoir, Lake Hills Village Condominiums is a small CWS with approximately 42 service connections and an estimated population of 102 people. Average daily demands for the system are approximately 1,200 gallons per day. The water system consists of a single active well with pH adjustment and a single hydropneumatic pressure tank believed to be original to the complex which was built in the mid 1960's. Triggers that have prioritized this PWS for capacity development include information obtained during the sanitary survey, and other PWS data including the number of water service outages due to difficult to locate distribution leaks (piping is under concrete slabs) and power outages (no backup emergency generator). The hydropneumatic tank was identified during the sanitary survey to be of high concern because of the tank explosion incident in southeastern Connecticut in June 2015 and the fact that the certified operator had reported that the severely corroded tank at Lake Hills Village was leaking but that the leak "had crusted over".

In early 2016, one of the condominium board members contacted the DWS for assistance. As a result, DWS managerial and TRFA staff along with the local health director attended several evening meetings with the condominium board and its certified operator to assist the association. The PWS was referred to RCAP for asset management (financial) assistance. RCAP was able to work with the association to develop an asset management plan an conduct an income survey that allowed them to apply for Rural Development funding for low-income communities. As a result of a loan becoming available in the summer of 2017, the system's certified operator submitted a project for approval. The project consists of a new 5,000 gallon tank with dual variable frequency drive transfer pumps to pressurized storage and a new propane-fueled permanent generator. The project was approved on August 14, 2017 and is expected to be constructed in the Fall of 2017. Once constructed, the project will greatly improve redundancy and resiliency for the water system as the atmospheric tank would allow trucked water to be delivered should the well pump go down. The generator will allow the water system to keep the water system in service during electric power outages.

Assessment of the Efficacy of the Capacity Development Program

Overall, the original Capacity Development Strategy has stood the test of time since it was approved nearly 16 years ago. By providing a strong foundation and framework for identification and prioritization of PWS in need of capacity development we are able to use a combination of regulatory and technical assistance based tools that have evolved over the years to meet the needs of Connecticut's PWSs. In 2017, small systems face even greater challenges than in the past. Regulations have become more stringent and complicated, including the new federal Groundwater Rule (GWR) and the Revised Total Coliform Rule (RTCR). Additionally, with significant revisions to the complex Lead and Copper Rule on the horizon, education and outreach will be a primary focus of the DWS, with a focus on small PWSs, moving forward.

The increased cost of compliance, operations, capital improvements and planning efforts must be passed on to the rate payers in order to achieve long term sustainability, and many times this has not been practiced responsibly by the smaller systems. Financial impacts of aging infrastructure and limited financing options leave small PWS in a difficult position. Efforts to streamline the take-over process for small water companies will continue to be a focus, so when a CWS is unable/unwilling to provide safe and adequate drinking water, the concepts in the Strategy will work to eliminate failing small community PWSs. The proposed asset management regulations for small CWSs will help raise awareness and highlight areas where DWS can continue its partnerships with state and federal contractors such as RCAP, the EFC, CT Section of American Water Works Association (AWWA), and Rural Water Associations.

Similarly, the DWS faces financial challenges of its own which must also be addressed to ensure goals are efficiently met. Financial challenges include the potential for decreased levels of federal PWSS support for SDWA primacy agencies and the DWSRF, as well as dwindling unliquidated obligations from previously received federal DWSRF awards. Competition for federal funding is very high in the current economic climate and federal budgets are being cut. For many years now, the DWS has proposed various fee collection methods in an effort to gain another means of financial support for the state's drinking water program. In January 2017, the DPH finalized its Report on Fees to the General Assembly, as required by Public Act No. 16-2 (May Spec. Sess. 2016), Section 17. In this report, the DPH presents its assessment findings on the financial and staffing support needed to run the DWS. Our 2017 License to Operate proposal has been the most supported and is a line item in the Governor's Budget Proposal for FY18 and FY19. Although the state does not yet have a finalized budget, the DPH is hopeful its program will receive the opportunity to receive this much needed financial support. The importance of safe drinking water must be communicated effectively to congressional leaders to ensure that financial support for state SDWA primacy programs and the DWSRF continue.

Conclusion

As is evidenced by our long list of Capacity Development Accomplishments for SFY17, the DWS works together across all functional units to meet the needs of Connecticut's PWSs with an ultimate goal of creating viable PWS that will provide safe and adequate water well into the future. In accordance with the Strategy, as issues present themselves, DWS works internally and with external partners to quickly mitigate problematic matters. A great example is our work to require emergency power provisions at all CWS critical infrastructure coupled with a streamlined DWSRF low interest loan program with principle-forgiveness as a mechanism for the CWS to meet the new regulation. In areas where we are not experts, many of our small CWS have benefitted from the DPH contract with RCAP to provide financial capacity expertise and aid systems in preparing asset management plans and conducting rate setting and financial management workshops. Last year, the first round of completed CATs was used in the rapidly-evolving WUCC process which has identified small CWS ownership and operations to be a key focus for the future. With the multitude of new regulations PWS are facing, DWS cannot lose sight of the everyday rule implementation and technical assistance work that ensures compliance, but must also be able to incorporate capacity development into every interaction with the PWS to maximize our time. The DPH DWS will continue to effectively apply resources to remain supportive of sustainable systems and will advocate for the elimination of systems unable to maintain acceptable levels of capacity. This aligns with the DPH DWS' consistent focus on the proactive protection of public health.

Appendix A - Acronyms

AM	Asset Management
AWWA	American Water Works Association
CAD	Compliance Assistance Database
CAT	Capacity Assessment Tool
CD	Capacity Development Unit
CIRCA	Connecticut Institute for Resilience and Climate Adaptation
CWS	Community Public Water System
CGS	Connecticut General Statutes
CPCN	Certificate of Public Convenience and Necessity
CUPSS	Check Up Program for Small Systems
DEEP	Connecticut Department of Energy Environmental Protection
DPH	Connecticut Department of Public Health
DWS	Connecticut Department of Public Health - Drinking Water Section
DWINSA	Drinking Water Infrastructure Needs Assessment
DWSRF	Drinking Water State Revolving Fund
EFC	Environmental Finance Center
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ESA	Exclusive Service Area
ETT	Enforcement Targeting Tool
GIS	Geographic Information System
GPRA	Federal Government Performance Results Act
GWR	Groundwater Rule
LCR	Lead and Copper Rule
LHD	Local Health Departments/Districts
HQS	High Quality Source
MCL	Maximum Contaminant Level
MOA	Memorandum of Agreement
NTNC	Non-Transient Non-Community Public Water System
OCCT	Optimal Corrosion Control Treatment
OPM	Office of Personnel and Management
OTT	Office of the Treasurer
PHAB	National Public Health Accreditation Board
PRS	Priority Ranking System
PWS	Public Water System
PWSS	Public Water System Supervision
PURA	Public Utility Regulatory Authority
RCAP	Resources for Communities and People
RTCR	Revised Total Coliform Rule
SAP	Source Assessment & Protection Unit
SEW	Sale of Excess Water
SFY	State Fiscal Year

SDWA	Federal Safe Drinking Water Act
SDWIS	Safe Drinking Water Information System
SDWRI	Safe Drinking Water Rule Implementation Unit
TMF	Technical, Managerial, and Financial Capacity
TNC	Transient Non-Community Public Water System
TRFA	Technical Review & Field Assessment Unit
ULO	Unliquidated Obligations
WebEOC	Web-based Emergency Operations Center
WPC	Water Planning Council
WSP	Water Supply Plan
WUCC	Water Utility Coordinating Committee

Appendix B - Listing of New PWSs and Newly Discovered PWSs

Listing of New PWSs created through the CPCN Process (Green) and Newly Discovered PWSs

PWS ID	PWS Name	PWS_ST_TYPE_CD
CT0819061	AQUARION WATER CO OF CT - WEST SHORE	C
CT0960221	AQUARION WATER CO OF CT-LAUREL RIDGE	C
CT0286013	THE CARING COMMUNITY OF CT, INC.	NTNC
CT0429213	201 WEST HIGH STREET	NTNC
CT0408034	BRIGNOLE VINEYARDS, LLC	NC
CT0429164	HOPE CHURCH OF EAST HAMPTON	NC
CT0429194	SPORTS ON 66	NC
CT0480234	LUANN'S BAKERY AND CAFE	NC
CT0550374	AJS STEAK & PIZZA RESTAURANT	NC
CT0581044	EAST COAST AUTO SALES & SERVICE	NC
CT0581054	HANNAH'S MARKET & DELI	NC
CT0614074	SAYBROOK ROAD LLC	NC
CT0699224	OU812, LLC - 165 HARTFORD TURNPIKE	NC
CT0869134	WIDE WORLD OF INDOOR SPORTS	NC
CT0869154	NASKART LLC	NC
CT1210194	FOX FARM BREWERY	NC
CT1609154	WILLINGTON DUNKIN DONUTS	NC
CT0121081	890 BOSTON TURNPIKE	C
CT0419221	31 GRIST MILL RD	C
CT0011103	NETWORK, INC.	NTNC
CT0081143	THE GRADUATE INSTITUTE	NTNC
CT0105073	NEWPORT ACADEMY	NTNC
CT0240262	THE OWL'S NEST DAY SCHOOL	NTNC
CT0261103	WHELEN ENGINEERING CO - AVIATION	NTNC
CT0419223	CHESTELM ADULT DAY SERVICES, INC.	NTNC
CT0529053	FARMINGTON CLUB	NTNC
CT0530324	SOUTHERN NEW ENGLAND EGG CO.	NTNC
CT0530343	FRANKLIN COMMONS	NTNC
CT0690622	EASTCONN	NTNC
CT0699213	60 HARTFORD PIKE	NTNC
CT0829084	6 WAY ROAD	NTNC
CT0839053	KLEEN ENERGY SYSTEMS INC	NTNC
CT0869143	RIVERVIEW FARM SEABIRD ENTERPRISES	NTNC
CT0869163	1495 ROUTE 85	NTNC
CT1085061	AQUARION WATER CO OF CT -OXFORD TOWN CTR	NTNC
CT1100112	VALLEY W.S. NORTH MOUNTAIN PUMP STATION	NTNC

PWS ID	PWS Name	PWS_ST_TYPE_CD
CT1129083	THE OWLS NEST DAY SCHOOL	NTNC
CT1341343	TTM PRINTED CIRCUIT - BUILDING 5	NTNC
CT0081134	BETHANY MART	NC
CT0121084	OUR PLACE RESTAURANT	NC
CT0229054	WILD SCOOPS	NC
CT0235084	GIV COFFEE ROASTERY AND CAFE	NC
CT0279054	CHAMARD VINEYARDS	NC
CT0286014	752 MIDDLETOWN ROAD - COLCHESTER	NC
CT0286024	PRIAM VINEYARDS	NC
CT0309144	CORNERSTONE OF COLUMBIA	NC
CT0321254	1657 BOSTON TURNPIKE - COVENTRY	NC
CT0331124	227 & 229 SHUNPIKE ROAD	NC
CT0419224	GOODSPEED REALTY LLC	NC
CT0429174	GUSTINE'S RV SALES & SERVICE	NC
CT0429184	ST. PATRICK CHURCH - PARISH CENTER	NC
CT0460174	SILVERMAN'S FARM	NC
CT0529054	CAROL'S LUNCHBOX	NC
CT0530334	260 ROUTE 32	NC
CT0530344	ARROWHEAD ACRES, LLC.	NC
CT0549054	ROBBS FARM LLC	NC
CT0549064	E. DRAGHI & SONS, LLC	NC
CT0581034	DOLLAR GENERAL - GRISWOLD	NC
CT0609114	NEW HAVEN SPORTSMAN'S CLUB INC.	NC
CT0614084	THE HADDAM NECK FAIR ASSOCIATION, INC.	NC
CT0614104	1564 SAYBROOK ROAD	NC
CT0688024	KENT FALLS BREWING COMPANY	NC
CT0727094	3 CENTER DRIVE	NC
CT0787084	RED BARN CREAMERY	NC
CT0798034	JESSICA'S GARDEN	NC
CT0798044	17 NORTH MAIN STREET	NC
CT0798054	THE FARM AT CARTER HILL	NC
CT0820284	144 MERIDEN RD	NC
CT0839054	MINER HILLS FAMILY GOLF LLC	NC
CT0859114	500 PURDY HILL ROAD	NC
CT0869144	ORIENTAL BAR & GRILL	NC
CT0900154	GRACE COMMUNITY CHURCH	NC
CT0969404	358 DANBURY ROAD	NC
CT0969414	BRIDGES RESTAURANT	NC
CT0969434	THE GREEN SPOT	NC
CT0999064	ROSABIANCA VINEYARDS	NC

PWS ID	PWS Name	PWS_ST_TYPE_CD
CT0999074	EVENTUS CATERING	NC
CT1000234	FREUNDS FARM MARKET & BAKERY	NC
CT1059283	JIA MEI LLC	NC
CT1059284	ALL PRO AUTOMOTIVE	NC
CT1059294	THE VILLAGE SHOPS	NC
CT1059304	ADVANCED FAMILY DENTISTRY OF OLD LYME	NC
CT1059314	HIGH HOPES THERAPEUTIC RIDING INC	NC
CT1059324	64-68 LYME STREET	NC
CT1069014	PASTA VITA	NC
CT1099224	ROUTE 12 TACO	NC
CT1099234	10 PUTNAM ROAD	NC
CT1169044	32 - 44 NORWICH ROAD	NC
CT1270244	SHERMAN LIBRARY	NC
CT1311084	PERRY PLAZA	NC
CT1341344	TTM PRINTED CIRCUIT - BUILDING 3A ANNEX	NC
CT1419084	THOMPSON SPEEDWAY-CONCESSION & GARAGE	NC
CT1419093	TRI-STATE BAPTIST CHURCH	NC
CT1429224	CROSS FARMS COMPLEX	NC
CT1435124	LOST BOYS BREWERY	NC
CT1479024	CLAUDIAS RESTAURANT & TOWN LIQUOR STORE	NC
CT1615184	WEIR FARM NATIONAL HISTORIC SITE	NC
CT1650104	DEM PRODUCE AND GARDEN CENTER	NC
CT1699104	TAYLOR BROOKE WINERY	NC

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

DPH Drinking Water Section Strategy to Address the Effects of Storms Irene, Alfred and Sandy on Connecticut's Community Public Water Systems
Original draft December 2011, last update July 2016)

Following the three storms that impacted Connecticut in 2011 and 2012, the Department of Public Health Drinking Water Section developed a strategy to address emergency preparedness for the state's community public water systems (CPWS). This public health strategy was developed in order to assure a safe and adequate water supply to the 2.9 million Connecticut residents served by CPWS. The strategy has the following objectives that address vulnerabilities, preparedness, resiliency and system capacity:

1. Assure sustained water supply for all CPWS,
2. Provide current and accurate large system status shared across WebEOC,
3. Work to develop mechanisms to prioritize restoration of street power to CPWS and priority facilities, and
4. Assure that small community public water systems are well prepared to proactively address emergency situations.
5. Assure system capacity
6. Assure adequate certified operator oversight
7. Assure adequate review and oversight of public water systems
8. Work toward more resilient CPWS through enhanced water supply planning

Storms Irene, Alfred and Sandy brought different challenges, however affected small satellite CPWS (systems that serve under 1,000 people) in a similar way due to lengthy power outages that impacted large regions of Connecticut. Further, while large CPWS (systems that serve over 1,000 people) were able to sustain water supply and system pressure, some experienced lack of priority to regain street power with multiple large scale pump stations and surface water treatment plants on generators for more than 7 days.

On average for all three storms, over 100 small CPWSs were on boil water advisory due to loss of system pressure caused by loss of street power. These systems represent a significant percentage of Connecticut's 450 small CPWS. Many small CPWS were ill prepared, lacked planning, and lacked adequate technical, managerial and financial capacity to address loss of street power for an extended period of time. Below is a summary of the effects of the three storms on the state's public water systems:

Phone: (860) 509-7333 • Fax: (860) 509-7359 • VP: (860) 899-1611
410 Capitol Avenue, MS#51WAT, P.O. Box 340308
Hartford, Connecticut 06134-0308
www.ct.gov/dph

- Storm Irene (tropical storm on August 29, 2011) –

    - 137 small cpws on Boil Water Advisory (30% of small cpws), these systems are shown in red on the attached map
    - 16,624 CT residents served by these 137 small cpws (19% of population served by small cpws)
    - Majority of small cpws that were on Boil Water Advisory were due to loss of system pressure caused by power outage (on average it was 5 to 6 days until power restoration)
    - Majority of sources and systems were not affected by flooding due to requirements to locate wells outside flood zone.
    - Majority of large cpws on shoreline area lost street power, however operations were not affected due to their emergency generator capacity, street power restored to these systems within a few days
    - 2.688 million CT residents retained their safe public drinking water (99% of CT residents served by cpws)
    - 51 small cpws (6,300 population served) affected by both storms shown in purple on map

- Storm Alfred (early season snow storm on October 29, 2011) –

    - 121 small cpws on Boil Water Advisory (26% of small cpws), these systems are shown in blue on the attached map
    - 20,212 CT residents served by these 121 small cpws (23% of population served by small cpws)
    - Majority of small cpws that were on Boil Water Advisory was due to loss of system pressure caused by power outage
    - Majority of large cpws along and north of the I-84 corridor lost street power, however operations were not affected due to their emergency generator capacity, street power restored slowly to these systems with some generators operating 8 to 9 days straight
    - 2.674 million CT residents retained their safe public drinking water (98% of CT residents served by cpws)

- Storm Sandy (hurricane category 1 on October 30, 2012) –

    - 100 small cpws on Boil Water Advisory, these system are shown in green on the presentations map
    - Majority of small cpws that were on Boil Water Advisory was due to loss of system pressure caused by power outage
    - Many large cpws lost street power, however operations were not affected due to their emergency generator capacity, street power restored very slowly to these systems with some generators operating 8 to 9 days
    - 2.7 million CT residents retained safe public drinking water

CTDPH believes that it is important for all community public water systems to have the capacity to sustain their system's water supply throughout extended loss of street power and therefore avoid the need to issue a boil water advisory to their customers. Public water systems that have emergency power capacity will avoid potential negative impacts to water quality, lengthy boil water advisories and unnecessary increased risk to public health due to potentially impacted drinking water quality. Currently in CT, small CPWS have no requirements that address the need for emergency planning or to have back-up power capacity.

The State's large CPWS had the capacity to supply water and sustain system pressures even with loss of street power due to their existing emergency power capacity. This capacity included emergency power generators not only in place for sources of supply and treatment systems, but also in place for pump stations in remote areas of their system. One challenge and vulnerability following each storm for the large CPWS included the need to capture the attention and understanding of local and state emergency managers to prioritize restoration of street power to large CPWS components including surface water treatment plants. Adding a system status component for these large CPWS to WebEOC will directly assist to meet this challenge as well as develop information to share with power companies to address street power restoration to critical public water facilities and critical public health facilities.

Based upon the above storm related effects and system vulnerabilities, the following DPH action items were developed in November 2011 and then updated following Storm Sandy to meet the above objectives:

DPH Action Items:

1. require small CPWS to have emergency power capacity
2. develop and provide for subsidized DWSRF loans to assist in purchasing generators
3. require small CPWS to develop an emergency plan
4. develop and provide workshops to assist to develop an emergency plan
5. add large CPWS status to WebEOC similar to hospitals
6. work with large CPWS to develop WebEOC templates
7. work with state's power companies and the water industry to promote critical facility priority power restoration
8. work with the state's public water systems to assess system vulnerabilities and build resiliency
9. revise and update certified operator regulations to address direct responsibility including emergency response
10. develop a scorecard as a Capacity Assessment Tool (CAT) for small CPWS to fully understand system capacity and initiate change as needed
11. work with a contractor and EPA TA providers and RCAP to provide for asset management planning, emergency planning and fiscal planning
12. develop a subsidized small system DWSRF loan program
13. work to develop regional vulnerability assessments and resiliency plans though utilization of $600,000 in HUD funding via DOH
14. work with EPA Region 1 and Headquarters staff concerning small system sustainability
15. move forward the WUCC process in order to assure large system involvement with understanding small CPWS issues and vulnerabilities
16. move forward with Asset Management legislation in order to require plan development
17. work with PURA to redevelop the CPCN and Takeover processes and legislation if needed

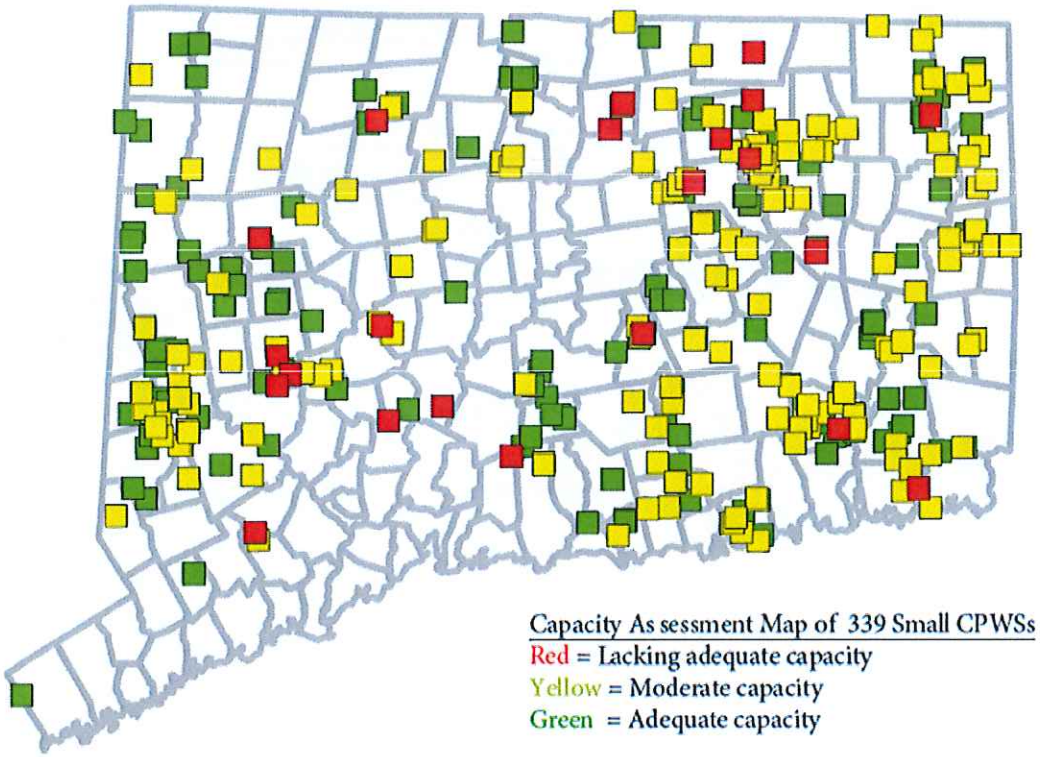
This document will be updated on an ongoing basis as projects move forward and issues evolve over time.

Last updated July 10, 2016

LJM

Appendix D - Capacity Assessment Map

Figure 1: Small Community Public Water System Capacity Assessment Map



Appendix E - FY2017 DWRSF Project Location Map