Coordinated Water System Plan
Part III: Final Integrated Report

Central Connecticut Public Water Supply Management Area

June 4, 2018

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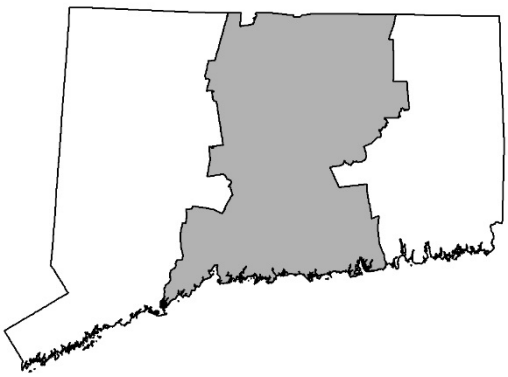

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NOTICE TO READERS

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Other Meeting Attendees

The Central Connecticut WUCC also appreciates the time and effort of the numerous non-member stakeholders who participated in and have contributed valuable insight to this process:

Stakeholders	Stakeholders
Connecticut Department of Energy & Environmental Protection	Prime AE Group
Connecticut Department of Public Health	Quinnipiac River Watershed Association
Connecticut Office of Policy & Management	RCAP Solutions
Connecticut River Watershed Council	Rivers Alliance of Connecticut
Farmington River Watershed Association	Save Our Water - CT
Members of the Public	University of Connecticut

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

Page

LIST OF TABLES

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF APPENDED TABLES

LIST OF APPENDED FIGURES

LIST OF APPENDICES

4.0 SATELLITE MANAGEMENT AND SMALL SYSTEM CHALLENGES

4.1 Satellite Management

Satellite management is defined in RCSA Section 25-33h-1(a)(10) as "management of a public water supply system by another public water system". Satellite management is common for small systems that are physically or geographically isolated from surrounding public water systems. Satellite management can be a cost-effective means of operating a small system because it takes advantage of the "economy of scale" factor that larger water suppliers can offer.

The term satellite system, while not defined in the regulations, is generally understood to mean a self-contained public water system that serves a discrete, usually small area that is not interconnected with a larger system or distribution piping network. Satellite systems typically serve a contained population, such as a condominium or apartment complex, a residential subdivision, a mobile home park, or a singular facility, such as a town hall, library, school, or business. Satellite systems may be managed by their owner (in the case of a private development) or a local government (in the case of a public facility), or they may be managed by a separate entity that owns and operates public water systems, such as a water company. It is the latter scenario that is considered satellite management. However, a better description of "satellite management" would be "satellite ownership and operation," as many entities that provide satellite management services operate under contract to an owner and management group.

Table 4-1 lists service providers that currently contract operator services to multiple public water systems that they do not own. This information is statewide and based on the DPH Contract Operator List as of November 2017 and may not be complete. Some of the contract operators also own and operate their own satellite systems. Several entities provide services in the vicinity of their office location while others are willing to perform these services statewide.

TABLE 4-1
Entities Willing to Provide Contract Operation Services to Public Water Systems

Contract Operator	Office Location
Al's Affordable Plumbing	Clinton
Aqua Compliance Specialists	Salem
Aqua Pump	Stafford
Aquarion Water Company	Bridgeport
Connecticut Water Company	Clinton
Eastern Water Solutions	Oxford
Fuss & O'Neill	Manchester
Groton Utilities	Groton
Hazardville Water Company	Enfield
Hungerfords Pump Service	North Haven
Hydro Dynamic Engineering	Southington
Jewett City Water Company	Griswold
JH Barlow Pump and Water Conditioning	Wolcott
John Findorak & Sons	Wilton

TABLE 4-1
Entities Willing to Provide Contract Operation Services to Public Water Systems

Contract Operator	Office Location
LaFramboise Well Drilling & Water Service	Thompson
Northeast Water Solutions	Exeter, RI
Southeastern Connecticut Water Authority	Ledyard
Stavens Brothers	Tolland
SUEZ	Paramus, NJ, et al.
Tomaszek Plumbing and Heating Services	Waterford
Torrington Water Company	Torrington
VRI Environmental Services	Lagrangeville, NY
Water Systems Solutions & Design	Watertown
Water Systems Specialties	Thomaston
Weston & Sampson	Peabody, MA
Whitewater Water & Wastewater Solutions	Charlton, MA

The information presented in Table 4-2 should be used as a resource for those small system providers that are currently providing limited service in remote areas and that wish to contract out their operations. In general, the vast majority of small CWSs and NTNC systems rely on contract operators to provide technical capacity for day-to-day maintenance of public water systems. In an effort to evaluate the future need for satellite contract operations, as well as the ability and willingness of water suppliers to provide such services, the ESA providers in the region were queried. Results are presented in Table 4-2.

TABLE 4-2
Satellite Management Needs and Opportunities of ESA Providers

ESA Holder	Intend to Operate Their Own Satellite Public Water Systems	Potential Need for Contract Operation by Other Providers	Available to Operate Satellite Water Systems for Others	Satellite Systems Unlikely to Occur in ESA
Avon Water Company	X			
Aquarion Water Company	X		X	
Berlin Water Control Commission	X		X	
Cromwell Fire District				X
Connecticut Water Company	X		X	
East Hampton WPCA		X^		
ESA Unassigned	X			
Hazardville Water Company	X		X	
Kensington Fire District				X
Manchester Water Department				X
Metropolitan District Commission				X
Meriden Water Division				X
Middletown Water Department				X
New Britain Water Department				X
Portland Water Department		X		
SCCRWA	X*			

TABLE 4-2
Satellite Management Needs and Opportunities of ESA Providers

ESA Holder	Intend to Operate Their Own Satellite Public Water Systems	Potential Need for Contract Operation by Other Providers	Available to Operate Satellite Water Systems for Others	Satellite Systems Unlikely to Occur in ESA
Southington Water Department				X
State Agency Existing Service Area				X
Tolland Water Department		X^		
Town of Bolton		X		
Town of Coventry		X		
Town of Durham		X^		
Town of East Haddam		X^		
Town of Lyme		X		
Town of Marlborough		X		
Town of Middlefield		X		
Valley Water Systems				X
Wallingford Water Division				X
Windham Water Works		X*		
Worthington Fire District				X

*Water main extensions preferred over satellite system operation for these utilities.
^Currently has a contract operator for its systems.

In general, the need for new public water systems in the region will be driven by the following conditions:

- Creating public water systems in some village centers may be necessary due to high densities and challenging lot sizes coupled with a desire for nominal economic growth (see also Appendix B.3);
- Creating public water systems in some village centers or neighborhoods may be necessary due to water quality concerns; and
- Developers will continue to approach local governments about new projects ranging from commercial establishments to various types of developments. Many of these will necessitate the development of new public water systems (community or non-community), particularly if local land use regulations push for dense, cluster-style developments to minimize impervious surfaces.

Because some portions of the Central PWSMA are rural, the need for public water service may not be able to be addressed by extension of existing public water systems. However, development of new public water systems must not be taken lightly, especially given the many small systems that are already located in the region and the fact that the creation of new systems is costly. When new public water systems are determined to be necessary, the construction of such systems is

While specific regulations have been developed governing the minimum standards to be met for the creation of new CWSs, regulations have not yet been developed for non-community water systems. The WUCC recommends development of such regulations in order to ensure standardized and consistent development of new non-community water systems across the state.

governed by the CPCN process codified in CGS 16-262m. This process is discussed in detail in Section 3 of *Final Recommended Exclusive Service Areas* (June 2017).

While the development of new small water systems is performed through the CPCN process, the WUCC has an important role in the creation of new water systems. Per RCSA Section 25-33h-1(k)(3), DPH requests that the WUCC recommend the creation of any new water system as opposed to developing a main extension. This process provides the opportunity for the WUCC to review the feasibly of a main extension between the applicant and nearby public water systems. In the future, such reviews should be performed prior to issuing a recommendation for the development of a new public water system.

The potential exists for many non-community systems to be consolidated and operated by an ESA holder. A dedicated source of funding is necessary to allow for the consolidation of such systems, as the cost is unlikely to be borne by a single developer or the individual systems being consolidated.

The WUCC recognizes the challenges of expanding small CWSs and non-community systems under private ownership to provide service to new properties but encourages this to be performed when possible (see Section 6.1 for an example). As a condition of approval, new NTNC and TNC systems constructed since 2007 have been required to consolidate with a CWS once one becomes available. There are presently no regulatory mandates (short of a Consent Order or activation of a takeover proceeding) for ordering older public water systems to consolidate, and such consolidation is often expensive. A dedicated funding source for consolidation of nearby systems would therefore allow for the consolidation of small water systems whose primary business is not the conveyance of public water supply, while developers would be able to reasonably cover the cost of a site-specific water supply evaluation and cost of design as done today.

With the development of ESAs across the Central PWSMA, the mapping developed for the *Final Recommended Exclusive Service Areas* (June 2017) depicts the areas in which ESA holders will be responsible for providing satellite management (ownership and operation) of new CWSs. For a few ESA holders, satellite systems are unlikely to be possible or necessary due to the near saturation of the existing system within the ESA, or due to the lack of buildable area in remaining unserved areas of the ESA.

Numerous local government ESA holders who may perform satellite management have indicated a possible need for contract operation of community and NTNC systems that are located within their ESA. All of these noted local governments currently provide service to limited facilities, such as schools and town halls. Several of these local governments have entered into agreements (some formal, some informal) with other providers for satellite management.

Several of the larger municipal ESA providers (i.e., currently providing service to greater than 1,000 people) have also indicated a possible future need for satellite management. For WWW, this is due to their general desire to connect new customers to their existing system and not own and operate satellite systems. WWW has expressed a desire to modify its ESA in the future, if necessary, to allow another utility interested in satellite ownership to own and operate a new satellite system.

4.2 Small System Challenges and Viability

Many of the public water systems in the Central PWSMA are small systems. 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. Furthermore, many of these small systems are associated with developments where the water system was designed as an accessory and not the primary component. For some systems, this has resulted in limited understanding of the technical, managerial, and financial needs of those public water systems.

Many small systems rely on components that are beyond their useful service life. However, planning to acquire loans from the Drinking Water State Revolving Fund (DWSRF) must be done in advance, whereas during emergencies small systems need access to capital immediately and typically need to secure traditional bank funding. Additionally, the current DWSRF program administered by DPH has been identified by many utilities as being burdensome and time consuming, particularly for small system owners who may not have the staff and time to complete the forms, address DPH questions, etc.

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 and deficiencies.

Lack of customer meters is another problem in small water systems. When individual customers do not know or understand their water consumption figures or the costs required to receive drinking water, the situation impedes the ability to recover true costs and discourages water conservation. Metering can be a physical challenge if apartments and condominiums are not arranged in a manner that facilitates meter installation.

Townsley Report

The Townsley Consulting Group, LLC prepared *A Review of Financial and System Viability of Connecticut's Small Community Water Systems Prepared for the State of Connecticut Public Utilities Regulatory Authority* (March 2014). The report was commissioned by Public Utilities Regulatory Authority (PURA) in response to Section 47 of Public Act 13-298. Townsley surveyed 348 small CWSs (serving less than 1,000 people) regarding technical and financial information with a response rate of about 30% (a little over 100 systems responded). In addition, Townsley randomly selected 65 CWSs to evaluate their sanitary survey reports. Finally, Townsley also discussed the acquisition process with major investor-owned water utilities.

The Townsley study concluded that the biggest costs for small utilities were regulatory compliance (including water quality sampling) and preventative maintenance. A small number of systems appeared to be in poor condition and needing significant capital investment. Approximately one-fifth of the systems were not currently collecting or obtaining sufficient revenues to meet daily operational needs, and approximately half were not able to escrow funds for future maintenance needs and emergencies. Overall, approximately 40% of the systems were operating "day-to-day" financially. A slight majority of respondents (56%) indicated that they would not be interested in being taken over by another utility. The study noted that increasing regulatory requirements may pose a risk to the continued financial

viability of some small systems. This integrated report has gleaned and adapted the following four recommendations from the findings of the Townsley report:

- Recommended developing a grant or loan funding mechanism specific to meeting small system needs (including streamlined forms);
- Recommended that PURA and DPH streamline the regulatory process for uncontested water system acquisitions, such as removing the need for the acquiring utility to essentially "re-permit" the system following acquisition. Use of a single, joint application to CT DPH and PURA was recommended, with the ability to waive unnecessary hearings, a less burdensome process for resolving disputes, and without a separate permitting effort;
- Recommended that PURA consider implementing an initial rate setting policy for new CWS requiring regulatory oversight to help ensure that the initial established rates are cost-based (to cover expenses and reserve fund); and
- Recommended identifying CWSs that would have high future capital requirements or other issues that would affect the ability to provide water service. One method was to improve the triennial inspection (sanitary survey) to include data collection on the status of infrastructure, future capital needs, and financial viability. To this end, the study recommended asset management legislation be reintroduced to provide a framework for small system viability.

Regarding the first recommendation, DPH appears to prefer continued utilization of the DWSRF to meet small system needs. This is discussed in Section 11. To date, the status of action on the second recommendation above is not known. Regarding the third recommendation, it is largely no longer germane as ESAs have been assigned throughout the state with ESA holders who will establish rates. Finally, the last recommendation developed into the Capacity Assessment Tool (CAT) now used by DPH to determine the technical, managerial, and financial viability of small water systems, and legislation[12] has been introduced regarding asset management for small systems.

The DPH activated a dedicated Sanitary Survey webpage in March 2018 to help small systems prepare for its sanitary survey. In addition, DPH is now requiring a capacity assessment questionnaire to be answered to provide additional information regarding managerial and financial capacity to inform the CAT. Finally, DPH is also requiring submission of ADD, MMADD, and PDD data for the past three calendar years and instantaneous flow rates for each source.

Limited information is available regarding the viability of small water systems. The CAT is a good method for understanding the status of such systems. Continued maintenance and enhancement of the CAT is recommended, which should be updated during each sanitary survey visit and provided to the surveyed water system as part of the sanitary survey report. In this way, each small water system will be made aware of areas for potential improvement. Development of a CAT specifically for non-community water systems, which are typically structured differently from CWSs, is warranted.

The Townsley Report contends that the largest costs for small utilities are regulatory compliance and preventative maintenance. Although the perception of compliance as a major cost may be true in practice for some systems that have deferred maintenance (therefore making maintenance costs artificially low), it is unlikely correct over the long term. If systems were keeping up with maintenance, that would likely be a much higher cost than regulatory compliance. The WUCCs should strive to educate small systems in this matter when possible.

[12] https://www.cga.ct.gov/2017/TOB/h/2017HB-07220-R00-HB.htm

Water Supply Assessment Report

As noted in the WSA report, the large number of small public water systems in the region is not viewed as an issue per se. However, the viability of these systems is an issue of concern, particularly in regions where the density of small systems is noticeable, such as in East Hampton. Additionally, 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 small water system technical, managerial, and financial capacity to provide water supply is of interest. Several sets of challenges are facing the region:

- Eliminating the proliferation of small systems may be possible in communities where larger public water system expansions have occurred, and therefore, these larger systems are now adjacent to small systems. Barriers to connecting small systems to larger systems (thus eliminating the small separate systems) include lack of funding and/or desire to make the investment, lack of interest from the small system, potential changes in water quality, inconsistencies between the design and technical standards of the small system and the acquiring utility, and potential changes in pressure. For the most part, these types of barriers should be feasible to transcend provided funding is available.

- Reducing the number of small systems may be possible in some communities where options are limited. For example, the Town of Marlborough has recently constructed a consolidated water system to replace the disparate non-community systems in its downtown area.

- Potential acquisitions of water systems may be of interest to system owners that are not in the business of providing water. For example, numerous small water systems are in operation that serve apartment complexes and mobile home parks. Some private boarding schools also exist in the region with education as their chief objective, and they may not be interested in water system management.

- Potential acquisitions of water systems may be of interest to owners that are currently experiencing significant technical, managerial, and capacity challenges. These systems, particularly the numerous non-community systems, could benefit from different ownership.

In general, small systems considered to have high technical, managerial, and financial capacity are considered to be viable while systems lacking capacity in one or more areas may not be viable. The DPH piloted the CAT in 2015 as a method for tracking the viability of small CWSs. For those systems found to be lacking capacity in one or more areas, conducting system improvements, interconnecting with another utility, consolidating with another utility, or becoming a satellite system of another utility are potential general options to improve capacity.

In some cases, the customers of a small community system with limited managerial or financial capacity to perform asset management and capital improvement planning may be better served by selling the water system to another utility (such as the surrounding ESA holder) who has been found to be capable of providing adequate technical, managerial, and financial oversight. In such a case, the customers would continue to rely on existing water system sources and infrastructure but would benefit from the

technical and maintenance support of a more administratively sound utility. Such satellite ownership and operation is presented as Option B in Section 4.3 below.

Interconnections in the region are discussed in more detail in Section 5.0. Interconnections are sometimes associated with system consolidation, but they are different concepts. An interconnection allows for flow of water in either one or both directions, sometimes during emergencies or seasonal shortages and sometimes to provide a sustained source of supply from one system to another. While water is shared between two systems, the management of each individual system continues to be performed by each respective utility. Interconnections are presented as Option C in Section 4.3 below.

Alternatively, consolidation serves to merge two separate systems to operate as one, physically and administratively. The system being consolidated ceases to exist as a separate water system, and any existing sources of supply and other water system infrastructure are reassigned to the utility and system performing the consolidation. This option is presented as Option D in Section 4.3 below. One challenge related to consolidation is the need to either abandon or obtain diversion permits for the sources of supply for the small system being consolidated. Abandonment is typically pursued when the small system supplies are not considered cost effective to operate.

4.3 Recommended Actions for Small Community Water Systems

As of December 2017, a total of 57 small CWSs in the central region were coded as "yellow" relative to the CAT score system and seven are "red". These numbers do not include satellite CWSs owned by larger water utilities (those that prepare WSPs such as AWC and CWC). These 64 systems (out of 129 total) were further evaluated to determine appropriate actions that can be taken to make them more sustainable and resilient. This evaluation was undertaken in partnership with the Drinking Water System Vulnerability Assessment and Resiliency planning process conducted by CIRCA and UConn in 2017 and 2018. Factors considered in the evaluation include the following:

- CAT score;
- Whether the CWS is within 1,000 feet of another CWS (this information was provided in the WSA report);
- Actual distance to another CWS; and
- Limitations related to sources, storage, or pumping. For example, some CWSs have only one source of supply (one well), and most lack atmospheric storage. Some have insufficient hydropneumatic storage, only bladder storage, or lack any storage whatsoever.

The WUCC believes it is inappropriate to assign single actions to individual small CWSs. Instead, a toolbox of options has been developed and each small CWS has been placed into a bin with several tools available for achieving improved resilience. The following tools were identified:

A. Conduct internal improvements and remain a small, independently owned CWS;
B. Pursue acquisition by a larger CWS and remain a satellite system owned and operated by the larger CWS;
C. Interconnection with a larger or more viable CWS; and
D. Interconnection and eventual consolidation with a larger or more viable CWS.

To ensure that each CWS has at least two tools, six bins were utilized. It is important to recognize that option A is always available as a tool for a small CWS. In addition, interconnection or consolidation of

more than one system in an area may be geographically feasible depending on the location of the project and should be considered as part of any project pursued under option C or option D above. Systems were placed into bins as follows:

1. A and B: 20 CWSs. These systems are typically too distant for an interconnection or consolidation to be a viable option. There are many examples in the region.
2. A and C: zero CWSs. Examples can be found in other regions.
3. A and D: zero CWSs. Examples can be found in other regions.
4. A, B and C: five CWSs. These systems may be sufficiently close to another system that interconnection is feasible, as is acquisition by a larger system. Examples are Lyme Regis and Boxwood Condominiums in Old Lyme which could interconnect with one another but likely would not consolidate, with an alternative option to be acquired by the ESA holder present in Old Lyme (CWC) and operated as satellites.
5. A, B and D: 14 CWSs. These systems are in areas where acquisition and operation of satellites is common, but eventual consolidation might make sense. Examples include the Whispering Hills development and the Ridgewood Hills Association both of which consist of multiple systems that could consolidate with one another or be acquired.
6. A, C and D: 25 CWSs. These systems are typically within 1,000 feet of another CWS and should therefore focus on becoming interconnected or consolidated.

CWSs coded “green” (high capacity scores) in the CAT were not included in the detailed evaluation described above, as they are believed more sustainable and resilient due to the individual components of their technical, managerial, and financial capabilities. However, some of the green score systems in Connecticut are located in close proximity to existing CWSs and should consider interconnections as a future tool for maintaining viability and increasing resilience. The following CWSs in the central region are applicable:

- Evergreen Trailer Park System #1, Clinton (consolidate all four systems as only System #4 contains atmospheric storage);
- Evergreen Trailer Park System #2, Clinton (consolidate all four systems as only System #4 contains atmospheric storage);
- Evergreen Trailer Park System #3, Clinton (consolidate all four systems as only System #4 contains atmospheric storage);
- Oak Grove Senior Housing, East Haddam (emergency interconnection with nearest system);
- Chatham Acres Elderly Housing, East Hampton (emergency interconnection with nearest system);
- Chatham Apartments, East Hampton (emergency interconnection with nearest system);
- Heritage Cove Condominiums, Essex (emergency interconnection with CWC);
- Meadowbrook Manor, Essex (emergency interconnection with CWC);
- AWC – Birchwood Estates, Marlborough (emergency or active interconnection with Hillside Corporation and/or Town of Marlborough NTNC system);
- Old Indian Trail, Middlefield (emergency interconnection with Middletown-Durham pipeline); and
- Chadwick Homeowners Association, Old Lyme (emergency interconnection with CWC).

The WUCC, in coordination with DPH, should develop a procedure for periodically reviewing the 64 yellow and red score systems in the bins as well as the green score systems that could be interconnected with other systems. The DPH should annually report on the status of such systems and document technical or planning-level assistance provided to any of them. Furthermore, the WUCC

should encourage DPH to regularly update the CAT for small community systems throughout the state and keep ESA holders advised of low-capacity systems within their ESA.

Although DPH and PURA may order a failing water system to be taken over by another utility, this process is relatively rare. It is important to note that unless ordered by the state through a takeover or other process, small systems must voluntarily accept transfer of ownership or consolidation. Therefore, there is no set schedule contemplated by the WUCC for any of the projects identified for these identified systems. Rather, systems are encouraged to evaluate their current situation and consider the general recommendations herein as potential solutions. Finally, regardless of the ESA holder, local municipal leaders should be kept apprised of any takeover process that may be initiated against a public water system in their community.

The WUCC regulations call for identification of public water systems willing to secure satellite management provided by another utility or willing to transfer ownership to another utility. The regulations also call for the development of a water system satellite management program and schedule for its implementation. In lieu of making binding determinations relative to these items in the regulations, the approach outlined above can be used to accomplish the intent of the regulations.

4.4 Emergency Management, Communications, and Voluntary Associations

Local governments are responsible for providing a priority power restoration list to electric utilities. These lists typically include critical local facilities such as the emergency operations center, fire departments, and public works facility; emergency shelters and schools that can be used as shelter; elderly and assisted living facilities; and infrastructure such as water and sewer pumping stations. Small water systems that are not considered critical facilities by local emergency management personnel are often not on that list. For example, a nursing home with its own water system would be on the local critical facility list due to challenges related to sheltering off site vs. sheltering in place, but an apartment building with its own water system would not be because such residents are more likely to have off site options. DPH has been focused on updating nursing home contacts recently, but it may be prudent to develop a secondary list of critical facilities for local governments that is comprised of small CWSs.

Likewise, emergency contact information is a key concern related to small systems. According to DPH, small CWS owners and operators often require several emails and telephone calls to elicit a response. Systems managed by voluntary associations are reportedly particularly difficult to contact because the association contacts can change frequently, and the level of water system managerial capacity can change rapidly. The merging of multiple levels of critical facility contacts and public water supply contacts into one system could help overall communications during and after emergencies.

The Drinking Water System Vulnerability Assessment and Resiliency planning process and report will likely provide recommendations for the above considerations. In the meantime, two provisional recommendations are as follows:

- Develop a list of CWSs to provide to local governments and the electric utilities that will be considered a second tier of critical facilities. When local hazard mitigation plans and emergency operations plans are updated, incorporate these inventories. DPH has already prepared such a list. Similar to the approach for dam emergency action plans, the contact information (person, telephone numbers, and email addresses) should be verified and updated biennially; and

- Augment DPH's list of emergency contacts with the pertinent contact information for the local emergency management director and his/her backup.

A method to phase out volunteer associations from being system owners should be considered in coordination with DPH. This would address limitations that voluntary associations currently face with regard to applying for grants and loans such as the DWSRF. Possible tools to reducing the number of voluntary associations include using the takeover process in the regulations or requiring a different ownership model for small CWSs. One recommendation is the following:

- The WUCCs and DPH should review the small CWS inventory to determine a subset of systems that are run by voluntary associations and reach out to such systems to determine whether technical, managerial, or financial assistance is needed.