**Introduction to Integrated Report Planning Elements of the**

**Coordinated Water System Plan**

**June 2017; Revised July 21, 2017**

1.0 Background

Section 25-33h-1 of the Regulations of Connecticut State Agencies require each Water Utility Coordinating Committee (WUCC) to prepare an Integrated Report. Whereas the Water Supply Assessment process was an inventory of existing conditions and identification of issues, deficiencies and needs, and the Exclusive Service Area (ESA) process delineated service area providers to meet potential future needs, the Integrated Report will analyze future conditions in recognition of the newly established and historical ESA boundaries. Per the regulations, the Integrated Report must contain the following:

* Population and consumption projections for 5, 20, and 50-year planning periods for the public water supply management area as a whole and for each municipality within the area;
* Projected population, historical and projected water demand by user category (e.g., residential, commercial, industrial, institutional, municipal, state agency, etc.) for 5,20, and 50-year planning periods for each public water system’s exclusive service area and for the combined service areas (each public water supply management area overseen by a WUCC);
* Sources of supply, safe yield, and amounts of purchased water available for 5, 20, and 50-year planning periods for each public water system’s exclusive service area and for the combined service areas (each public water supply management area overseen by a WUCC);
* Determination of the amount and percentage of projected population within each municipality within the public water supply management area to be serviced by public water supplies for 5, 20 and 50-year planning periods (effect of population growth, decline, etc. on public water supply need);
* Identification of areas not within exclusive service area boundaries and discussion of water supply alternatives;
* Discussion of the relationship and compatibility of the coordinated water system plan with proposed or adopted land use plans and growth policies, as reflected in local, regional and state plans. Consideration should be given to both protection and development of public water supply sources and to availability of public water service;
* Evaluation and identification in priority order of alternative water sources recommended to supply future areawide water system needs. Include appropriate ground or surface water studies, safe yield estimates and arrangement for development and delivery of the water supply;
* Plans for any necessary interconnection of both raw and treated water between public water systems for both daily and emergency water supply use;
* A plan for joint use, management or ownership of services, equipment, or facilities (e.g., for emergency use);
* A plan for satellite management or transfer of ownership;
* Provisions for minimum design standards applicable to all water system improvements and all new public water systems within the management area (e.g., suggested technical standards and details);
* Presentation of financial data as related to areawide issues such as interconnections, shared or joint use facilities, regional projects, and information not included in individual water system plans; and
* Consideration of the potential impacts of the plan on other uses of water resources, including water quality, flood management, recreation, hydropower, and aquatic habitat issues.

In December 2016, each regional WUCC published its Water Supply Assessment, which identified the following issues, needs, and deficiencies to be addressed in the Integrated Report:

*Sources of Supply*

* Existing Supply Sources
* Future Supply Sources
* Impacts of Climate Change
* Impacts of Current Streamflow Regulations
* Impact of Future Anticipated Regulations
* Source Water Protection
* Raw Well Water Quality
* Environmental Concerns Associated with Water Withdrawals

*Planning*

* Coordination of Water Utility Planning
* Coordination of Planning between Utilities and Communities
* Disjointed Service Areas
* Exclusive Service Areas
* Use of Current Data

*Interconnections*

* Development of New Interconnections
* Movement of Water through Interconnections

*Small Water Systems*

* Challenges of Operating Small Systems
* New Public Water Systems
* Viability of Small Water Systems

*Water Usage*

* High Water Usage by Agricultural, Industrial, and Power Generation Facilities
* Declining Revenue and Increasing Costs
* Increasing Ratio of Peak-Day Demands to Average-Day Demands
* Infrastructure
* Lack of Fire Protection
* Lack of Funding
* Water Conservation
* Enactment of Voluntary and Mandatory Conservation Measures

2.0 Integrated Report Planning Periods

The regulations define the 5-, 20-, and 50-year planning horizons. The 5-year horizon is projected from the time of the Coordinated Water System Plan development or, in this case, the year 2023. The 20- and 50-year planning horizons are projected from the last U.S. census, or 2010. Accordingly, the 20- and 50-year planning horizons are 2030 and 2060, respectively.

3.0 Process and Timeline

The schedule on the following page presents a timeline for *draft* completion of the Integrated Report elements by December 2017 to enable time for public review, document completion, preparation of the final element of the Coordinated Water System Plan (the Executive Summary), and approval of the Coordinated Water System Plan in May 2018. This schedule will enable completion of the statewide Coordinated Water System Plan by June 2018, as required by regulation.

Prior to each meeting, WUCC members will be provided with background information and discussion prompts that will serve to focus the meeting discussions and input from WUCC members. Members are encouraged to submit their responses in writing to help document the discussions. This information will be used to draft the associated Integrated Report sections.

4.0 Data, Mapping, and Information Needs

The following specific information is required from each ESA holder within the region by the November 2017 WUCC meeting:

* Calendar year 2016 raw water withdrawn and finished water distributed by month
* Calendar year 2016 average day, peak day, and peak month demands
* Calendar year 2016 water use by user category (e.g. residential, commercial, industrial, institutional, municipal, and unaccounted-for water)
* Calendar year 2016 purchased and/or sold water to/from another utility, by month
* Service area population projections for the 5-, 20-, and 50-year WUCC planning periods for your ESA
* Water demand projections for the 5-, 20-, and 50-year WUCC planning periods for your ESA
* Planned new sources of supply, if any, for the 5-, 20-, and 50-year WUCC planning periods for your ESA, and status of capital planning for such sources
* Planned water purchases for the 5-, 20-, and 50-year WUCC planning periods to serve your ESA
* Proposed plan to serve any currently unserved areas within the ESA boundaries (including previously allocated or expanded ESA boundaries)
* Planned interconnections, and status of capital planning for such interconnections
* Anticipated impacts (if any) from the streamflow regulations
* List of any joint use/jointly managed or jointly-owned services, equipment, and facilities, or the willingness to participate in such arrangements
* Plans for satellite management of systems
* Any information on how future regulations may impact the utility

Integrated Report Module #1

Topic: Maintenance and Replacement of Existing Supply Sources/Asset Management

Genesis: Asset management was raised in the Water Supply Assessment under the topic of issues, needs, and deficiencies. Specifically, the WSA reflects the following:

*Infrastructure* – Water infrastructure is aging, with the cost of repair and/or replacement, the need for asset management (evaluating both repair [on-going operating costs] and replacement [one time capital costs]), and mechanisms for funding being shared across small and large systems alike. Replacement cycles are getting longer, and infrastructure is getting older, is becoming more costly to operate and repair, and more vulnerable to failure.

*Existing Supply Sources* – Some groundwater sources require maintenance to maintain the hydraulic capacity and water quality while other sources require eventual replacement. Finding locations for replacement water supply wells of sufficient hydraulic capacity is challenging and expensive due to the cost of land, encroaching developments, permitting, engineering, and other factors.

Goal: To develop a regional strategy and approach to addressing maintenance and replacement needs, and asset management.

Discussion Prompts:

1. How does your system specifically budget for maintenance and replacement of sources and/or assets?
2. What planning period do you use for capital improvement planning (e.g., 5-year, 10-year, etc.)? How is your capital plan developed, approved (as applicable), and revised?
3. Are your maintenance and replacement planning processes the same, or are they tracked separately?
4. What percentage of capital improvements are planned, and what percentage of capital improvements are reactive (i.e., in response to a break or failure)?
5. How comprehensive is the formal asset management plan for your system? Describe the types of infrastructure covered in the plan (e.g. supply, treatment, distribution, pumping stations, storage tanks, etc.)
6. What are the most critical elements of your water supply system relative to maintenance and replacement?
7. If your system relies on groundwater wells, have you had to redevelop or relocate them since bringing on line? If yes, after approximately how many years of operation was maintenance/replacement needed?
8. Generally speaking, how does your system fund maintenance and capital improvements? Do you generally fund all of the identified needs? If not, how do you decide what is improved and what is deferred?

Integrated Report Module #2

Topic: Financial Considerations/Declining Revenue vs. Increasing Costs

Genesis: The Coordinated Water System Planning regulations require presentation of financial data as related to areawide issues such as interconnections, shared or joint use facilities, regional projects, and information not included in individual water system plans. Additionally, the Water Supply Assessment raises numerous issues, needs, and deficiencies surrounding coordinated planning. Specifically, the WSA reflects the following:

*Declining Revenue and Increasing Costs* – Some water systems are experiencing a trend of decreasing average-day demands. With continued conservation, the decline of industry, and the housing market decline of the Great Recession (2008 to 2010), water systems have been challenged by declining revenue. Because of the high fixed-cost requirements of public water systems, this has, in some cases, negatively impacted levels of service and made purchasing and/or financing new infrastructure and infrastructure upgrades and repairs more challenging. Creative solutions, such as the infrastructure replacement and revenue adjustment mechanisms authorized under Public Acts 07-139 and 13-78, respectively, are needed to recapture lost revenue and/or pay for maintenance and improvements.

*Lack of Funding* – A continued lack of straightforward access to capital improvement funding has delayed many desired projects in the region. The Drinking Water State Revolving Fund 2011 Needs Survey identified $3.5 billion in infrastructure replacement needs over the next 20 years, and the 2015 survey results yet to be published are expected to be even higher.

Goal: To better understand the financial issues and needs in the region, develop planning level cost estimates for future regional projects, and identify potential funding sources

Discussion Prompts:

1. Describe the extent of metering in your system (production metering, customer metering, etc.). How often do you read your meters? What type (technology) of meter do you utilize (e.g. Advanced Metering Infrastructure [AMI] or Automatic Meter Reading [AMR], etc.)?
2. What metering improvements are you considering or planning?
3. Is your system financially self-sufficient, or does it rely on outside budgetary assistance or have its budget as part of a larger operations budget?
4. Is your rate structure inclining, declining, or flat? How many years do you typically wait between rate increases?
5. Describe your system’s general demand trends over the past five to ten years. Has your revenue generally increased or decreased in line with demand trends?
6. If revenue has been declining, how have you addressed it (or are planning to address it)? In which year did the decline in consumption begin to be noticeable? What impacts has the decline in revenue had on your ability to operate the system?
7. Have you received state or federal funding for past or ongoing projects? If so, please describe the type of funding received, the amount of funding, and the funding terms and conditions (both financial and administrative). Please share any lessons learned regarding applying for state or federal funding for water system projects.

Integrated Report Module #3

Topic: Coordination of Planning (Between Systems, with Towns, Across ESA Boundaries)

Genesis: The basis and legislative finding contained in CGS Section 25-33e specifically directs the Department of Public Health to administer a procedure to coordinate the planning of water supply systems. The subsequent regulations require the WUCCs to discuss the relationship and compatibility of the coordinated water system plan with proposed or adopted land use plans and growth policies, as reflected in local, regional and state plans, with consideration given to both protection and development of public water supply sources and to availability of public water service. Additionally, the Water Supply Assessment raises numerous issues, needs, and deficiencies surrounding coordinated planning. Specifically, the WSA reflects the following:

*Coordination of Water Utility Planning* – In the years since the Bioterrorism Act of 2002 and throughout the revision and updates to Emergency Contingency Plans, many larger water utilities have made significant advancements in emergency planning with other utilities through memorializing mutual aid agreements and formalizing other forms of cooperation. Additional coordination between community water systems (CWSs) with respect to various aspects of water supply, such as shared use of equipment and technical staff, is also desirable from a financial perspective. Improved coordination has the potential to greatly benefit smaller systems that may not have the financial ability to purchase (or rent) equipment such as that required for spill response or emergency power. Additionally, a key benefit of improved coordination among water utilities is the potential to establish a more organized and holistic approach to the exploration of future water supplies and interconnections. The WUCC process is precisely aimed at such coordination efforts.

*Coordination of Planning between Utilities and Communities* – In some cases, state, regional, and local planners have limited understanding of the long-term planning goals of water utilities and vice versa. For example, although larger utilities account for local planning efforts as part of their water supply plans (WSPs), this information does not necessarily inform the local or regional planner. Review of the Coordinated Water System Plan should be encouraged as part of local planning efforts along with increasing the lines of communication and coordination between larger utilities and local staff. In addition, planning between water utilities and communities is typically performed in a staggered manner, with utilities reviewing current planning documents that may be several years old.

Goal: To identify means and measures aimed at improving communication and coordination among systems and between systems and their service communities.

Discussion Prompts:

1. If you are a municipal utility, what mechanisms are in place for coordination with other municipal departments relative to water supply, such as during emergencies (drought, loss of electrical power, large storms, etc.)?
2. If you are not a municipal utility, describe your formal mechanism and frequency by which you communicate with the local governments for your service community(ies).
3. Describe your communications with surrounding water system representatives. To what extent do you coordinate (emergency planning, infrastructure planning, etc.)?
4. Do you have any specific suggestions as to how communication and coordination could be improved among water systems, municipal government, with State agencies, and within the region? How could the WUCC assist with communications between utilities and local governments (many of which are WUCC members)?
5. When you conduct reviews of local development plans within the watershed of your supply source or within your aquifer protection area, are your concerns given weight and addressed by regulatory agencies (i.e., how much clout does your utility have with local governments of municipalities in your source water area)?

Integrated Report Module #4

Topic: Source Water Protection

Genesis: Source protection was raised in the Water Supply Assessment (WSA) under the topic of needs and deficiencies. Specifically, the WSA reflects the following:

*Source Water Protection* – Protection of the environment and protection of water supply sources are in many ways mutually beneficial. Source protection and environmental conservation, for instance, are harmonious throughout many drinking water supply watersheds and groundwater aquifers. Watershed and wellhead protection for both existing and future supply sources has made significant progress in the past 15 to 20 years with completion of the Source Water Assessment Program (SWAP), completion of the majority of the Level A mapping, and full implementation of the Aquifer Protection Area (APA) regulations. However, continued land development and the need to address issues that cross jurisdictional boundaries are of particular interest regarding watershed lands and groundwater aquifers. While DPH has promoted a program to assess systems that cross municipal divides (known as the Drinking Water Quality Management Planning process) and address protection of drinking water supplies on a regional scale, there has been little traction for using this unique collaborative approach in the Central PWSMA.

Goal: To heighten individual utility and regional efforts towards source water protection, share ideas among utilities, and develop a regional approach to protecting the region’s drinking water supply sources

Discussion Prompts:

1. Do you have a groundwater supply, reservoir supply, or both?
2. Describe your source water protection program. What measures (in general terms) do you currently undertake to protect your sources of supply? Describe the level of effort you expend implementing source water protection measures.
3. Does your source water area span multiple jurisdictions? If so, describe any additional challenges you face.
4. What are your specific concerns regarding source water protection?
5. Do you have any specific recommendations for improved source water protection in your system, in small community and non-community systems, and/or throughout the region?
6. What resources or organizations are helpful or have partnered with you to promote source water protection? What additional assistance is needed?

Integrated Report Module #5

Topic: Joint Use, Management, or Ownership of Facilities; Shared Resources

Genesis: The Coordinated Water System Planning regulations require a plan for joint use, management or ownership of services, equipment, or facilities.

Goal: To understand the realities and benefits of joint use, management, or ownership of facilities and shared resources and identify means and measures to most efficiently enable sharing of equipment, people, and knowledge

Discussion Prompts:

1. Do you share resources with another system, including joint ownership of equipment or facilities? If so, please generally describe your arrangement.
2. Would your utility benefit from future shared resources or joint ownership of infrastructure, such as supply sources, storage, treatment, or distribution system components, or greater purchasing power through bulk purchases with multiple water systems then splitting the commodity (e.g. treatment chemicals) with delivery to multiple locations? If so, please describe.
3. Do you have shared resource agreements (formal or informal) with one or more utilities or municipalities? If so, please generally describe the nature of your agreement. How were they developed? What was critical in developing this agreement? Who were the parties involved?
4. Describe your familiarity with the CTWARN program. Are you a member? Have you requested assistance through CTWARN in the past to respond to a water system emergency?

Integrated Report Module #6

Topic: Fire Protection

Genesis: Lack of fire protection was raised in the Water Supply Assessment under the topic of needs and deficiencies. Specifically, the WSA reports the following:

*Lack of Fire Protection* – Many rural parts of the Western and Eastern PWSMAs are relying on ponds, dry wells, and cisterns for fire protection. While this is less common in the Central PWSMA, the eastern fringe along with other discrete areas of the Central region does rely on these types of protection. These approaches will continue in most of the rural areas but may not be desired in specific areas that would benefit from increased protection afforded by a public water system with sufficient storage and adequate pressure. Additionally, some parts of the region are already served by public water systems where hydrants are installed but pressures are currently insufficient to meet fire flow requirements.

Goal: To evaluate the need for and develop a regional approach to fire protection

Discussion Prompts:

1. Describe your system’s fire protection capabilities, if any. Is there sufficient fire protection coverage (including both flow and pressure) for the entire service area, or only a part?
2. What means of fire protection (other than that which may be provided by your water system) is employed within your exclusive service area boundary and who provides it?
3. Describe the general vulnerability of the service area to fire hazards. Are their areas where large fires could occur that would place a significant strain on the public water supply system? If so, what types of fires would be involved (densely-spaced structures, abandoned industrial buildings, woodland fires, etc.)?
4. Describe any fire-fighting resources in your system that could potentially benefit neighboring water systems or municipalities if shared.
5. Based on your experience, please describe any specific strategies and/or approaches that should be considered within the region to address fire protection needs.

Integrated Report Module #7

Topic: Water Conservation, Drought Planning, High Volume Users, and Increasing Peaking Ratios

Genesis: Water conservation was raised in the Water Supply Assessment (WSA) under the topic of issues, needs, and deficiencies. Specifically, the WSA reflects the following:

*Water Conservation* – Water conservation is an important element of sound public water system operation. In some cases, significant conservation measures have already been enacted, and additional water conservation efforts by a utility may have a minimal return. While all of the larger utilities practice water conservation, many smaller systems limit conservation to end-user controls such as low-flow toilets, faucets, and showers. Additionally, many smaller systems have minimal meters, and the amount of lost or wasted water is unclear. Continuing education is necessary to inform users of conservation methods, and additional education is needed for the general public regarding the amount of water being saved today that may have been wasted in the past. Water conservation may also be an issue with some systems where declining revenues are already negatively affecting revenue requirements.

*Drought Triggers* – In response to the drought of 2015-2016, many water utilities activated their drought triggers. Several utilities found the drought triggers did not initiate early enough, and then the triggers moved from one drought stage to the next very quickly, necessitating rapid response that may not have been as effective as desired. In addition, some utilities found themselves in an emergency situation before impact of earlier response measures were felt. Revisions to the drought triggers were necessitated in some cases as part of the emergency declarations. The primary lesson learned was that a one-size-fits-all approach to drought trigger planning may not be appropriate due to the site and facility-specific configurations that drive local water planning.

*Enactment of Voluntary and Mandatory Conservation Measures* – The recent droughts in Connecticut have raised public awareness of voluntary and mandatory water conservation measures, which are enacted by many utilities to reduce demands during a drought. Typically, such reductions are requested on a percentage basis for each customer. One issue raised by the public as part of the recent widely reported and protested commercial bottling plant in Bloomfield was whether commercial/industrial users should be completely shut off prior to limiting water for residential customers. The WUCC will evaluate potential refinements to the methodology of how drought-related conservation measures are enacted in the customer base in the Integrated Report.

*High Water Usage by Agricultural, Industrial, and Power Generation Facilities* – Some agricultural, industrial, and power generation facilities require substantial water commitments from nearby public water systems for active daily supply as well as potential peaking supply, and there is often a large discrepancy between these figures. Some of these facilities do not require potable water and may be better served by non-potable water.

*Increasing Ratio of Peak-Day Demands to Average-Day Demands* – Some water systems are experiencing a trend of decreasing average-day demands along with an increase in peak-day demands. This negatively impacts the ability to manage sources and treatment facilities in some systems and points to a need for greater conservation during peak-day conditions. This is often the case during the summer months coincident with irrigation and water-intensive recreational activities. In most cases, the increasing peak day demands are associated with outdoor water use such as watering lawns. Utilizing treated, potable water to irrigate lawns is something many members of the public and environmental groups are concerned about in light of other water uses such as potable demands, aquatic habitat needs, and recreational needs. Although reservoir systems are typically better able to handle increased peak-day demands than groundwater systems from a supply perspective (provided adequate treatment capacity exists), increased peak-day usage by reservoir systems is of concern to DPH as overuse of surface water sources can result in taste and odor complaints, elevated levels of cyanotoxins, and other water quality concerns. Conversion of peak-day irrigation use to lower, more stable water uses would benefit all the customers of the system.

Goal: To better understand and develop best practices for water conservation within the region, identify deficiencies that may exist, and evaluate potential refinements to the methodology of how drought-related and peak-day conservation measures are enacted

Discussion Prompts:

1. Do you have a formal water conservation plan and if so, what is the date of the last revision?
2. What supply side and demand side water conservation measures do you actively employ?
3. What conservation measures have been most beneficial for your system?
4. Do you have high-volume usage agricultural (including golf courses), industrial, or power generation customers within your exclusive service area? If so, approximately what percentage of your daily demand is comprised by these high-volume users, particularly during the summer months?
5. In general, has your system experienced increasing ratios of peak-day demands to average-day demands over the past ten years? How does your peaking ratio change between the winter months and the summer months? What have you done to urge customers to reduce day-to-day outdoor water use in the summer months?
6. What are your drought trigger levels based on? As noted above, a one-size-fits-all approach to drought trigger planning may not be appropriate. How often in the last 10 years have drought triggers been initiated? Describe how you disengage (i.e., step back out of) from your drought stages. Have your drought triggers changed, or are these likely to change upon implementation of the Streamflow Standards and Regulations?
7. Please describe your lessons learned regarding these items over the past two years of sustained drought. How have these lessons influenced the way you will perform system planning moving forward? For example, do you have suggestions for drought trigger revisions that could be shared in the WUCC?

Integrated Report Module #8

Topic: Satellite Management / Small System Challenges and Viability

Genesis: The Coordinated Water System Planning regulations require a plan for satellite management or transfer of ownership. Additionally, the Water Supply Assessment identified the following issues, needs, and deficiencies associated with the operation and management of small water systems:

*Challenges of Operating Small Systems* – Many municipalities and privately owned public water utilities own and operate numerous small systems. Operational requirements such as regulatory permitting, technical assessment, system maintenance and repair, 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 community water systems (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.

*New Public Water Systems* – In general, the need for new public water systems in the region is 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 growth.
* Creating public water systems in some village centers or neighborhoods may be necessary due to water quality concerns.
* Over time, developers are expected to approach municipalities about new projects ranging from commercial establishments to various types of residential developments. Many of these will necessitate the development of new public water systems (whether Community or Non-Community).

Some of the above needs may be addressed through extension of existing public water systems. However, not all areas may be easily served by water main extensions, and system expansions and creation of new systems is costly.

*Viability of Small Water Systems* – The number of small public water systems in the region is not viewed as an issue, per se. However, the operational and financial viability of these systems is an issue of concern, particularly in areas where the density of small systems is moderate to high. 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 the technical, managerial, and financial capacity of small systems 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 these larger systems are now immediately adjacent to small systems. Typical 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, 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.
* Potential acquisitions of water systems may be of interest to system owners whose primary business is not providing water.
* 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.

Goal: To better understand which systems within the region may be amenable to and would benefit from consolidation and/or satellite management.

Discussion Prompts:

1. Describe the biggest challenges for owning and operating a small water system.
2. Have you ever taken over or assimilated a small system? If so, describe any lessons learned. What was the most challenging part of the process? How could the process be improved?
3. Do you operate any community water systems that you do not own? If so, describe any lessons learned. What are the biggest challenges to operating a system owned by another entity? How could those challenges be mitigated? If not, describe why you choose not to provide contract operation services.
4. Do you plan to purchase other small water systems to own and operate? Describe why you are interested (or not) in operating small water systems.
5. Do you utilize a contract operator to operate all or portions of your system? If so, describe the biggest challenges to working with contract operators. If not, describe why you do not utilize a contract operator (can manage in-house, TNC system doesn’t require, too expensive, etc.).

Integrated Report Module #9

Topic: Minimum Design Standards

Genesis: The Coordinated Water System Planning regulations require provisions for minimum design standards applicable to all water system improvements and all new public water systems within the management area.

Goal: To establish regional minimum design standards.

Discussion Prompts:

1. Does your system have minimum design standards that are unique from the state design standards? If so, in what ways to they differ (what utility requirements exceed the state requirements)? Do they cover construction of new water systems, main extensions and service connections, or both? What design standard is believed to be the most critical for your utility?
2. How are your minimum design standards communicated to developers, contractors, and customers within your exclusive service area?
3. Do you have specific recommendations for improving minimum design standards related to safe yield, source protection, water quality, fire protection, treatment, or distribution system components? If so, what was the rationale for developing these minimum design standards?

Integrated Report Module #10

Topic: Future Sources (Wells, Reservoirs) / Raw Well Water Quality / Acquisition of Land for New Stratified Drift Wells

Genesis: The Coordinated Water System Planning regulations require evaluation and identification, in priority order, of alternative water sources recommended to supply future areawide water system needs, considering appropriate ground or surface water studies, safe yield estimates and arrangement for development and delivery of the water supply. The regulations also require the WUCC to identify areas that are not within exclusive service area boundaries relative to water supply alternatives. Additionally, the regional Water Supply Assessments raise the following issues, needs, and deficiencies surrounding coordinated planning:

*Future Supply Sources* – Several of the community water systems (CWSs) in the region have identified the need for additional water supply sources to meet current and future projected demands due to continued development within their existing service areas. Many systems rely on modest networks of surface water supplies and groundwater supplies that are located within municipal boundaries or nearby in adjacent communities. These CWSs may not have the ability to easily develop new sources of supply. Even larger utilities have identified the potential need for additional supply sources if future conditions warrant. There are a number of proposed source alternatives that continue to be included in Water Supply Plans, even when obstacles to development have been identified (such as proposed use of Class B water bodies [e.g. Candlewood Lake] or sites where there are significant environmental concerns). This may speak to a need to more critically assess proposals in individual water supply plans, especially with respect to potential adverse environmental impacts associated with source alternatives.

*Raw Well Water Quality* – It is recognized that the raw well water utilized for public drinking water in the region tends to be variable with respect to quality and quantity. Elevated concentrations of arsenic, radioactive elements, and/or iron and manganese are prevalent in certain public water system well supplies, and treatment can be costly. In general, poor water quality and legacy contamination may present a disproportionate burden on small CWSs and Non-Community water systems, and therefore it may necessitate extending public water systems into areas currently served by private wells or the creation of new public water systems.

Goal: To understand future water supply needs (wells and reservoirs only) in the context of newly established exclusive service area boundaries and water quality challenges within the region.

Discussion Prompts:

1. Do you forecast that your system will require additional sources of supply (wells or reservoirs) in the 5-, 20-, or 50-year WUCC planning periods? If so, what planning has your system undertaken to date for their development (e.g., do you have cash set aside to purchase land for wellfield development)?
2. Are you experiencing, or have you experienced in the past issues relating to raw water quality or quantity? If so, how are you/have you addressed them?
3. If you identify potential new sources of supply in your Water Supply Plan, what are the barriers to developing those specific sources?
4. What do you perceive as the three biggest obstacle(s) to procuring or developing new sources of supply in general? Please list the three biggest obstacles in priority order.

Integrated Report Module #11

Topic: Future Interconnections and Impact / Disjointed Service Areas / Integration

Genesis: The Coordinated Water System Planning regulations require reporting of plans for any necessary interconnection of both raw and treated water between public water systems for both daily and emergency water supply use. Discussions during the State Water Plan process considered interconnections at length. The discussions centered on how interconnections could be encouraged not only from a system resiliency and flexibility standpoint, but also to potentially provide flexibility to alleviate environmental stress. As required in CGS Section 25-33h(a), the coordinated water system plan is to consider the impact on other uses of water resources, and interconnections must be considered in this context.

Additionally, the regional Water Supply Assessments raise the following issues, needs, and deficiencies surrounding coordinated planning:

*Disjointed Service Areas* – Numerous communities are served by multiple public water systems (whether privately owned or municipal or regional) that are located proximal to one another but are not actively interconnected, which can result in higher cost of operation, lack of efficiency, and lack of redundancy. In some cases, the cost for a customer to purchase water can be significantly more expensive in one system than the other system despite the customer's proximity.

*Development of New Interconnections* – New interconnections may be desired where not already present. This can help address water supply imbalances and increase redundancies that are desirable during water supply emergencies or droughts. Some interconnections will require pumping stations, meter pits, and/or pressure-reducing valves, which can greatly add to the project cost. The development of interconnections should include consideration of raw water interconnections among utilities that utilize surface water supplies which could be utilized to bolster surface water supplies during prolonged drought conditions.

*Movement of Water through Interconnections* – The movement of water from areas of surplus to areas of need is not always straightforward, even where interconnections are already present. Potential barriers include water quality differences, pressure gradients, the challenges associated with diversion permitting (although the general permit has streamlined many of the interconnection diversion permit processes), and/or lack of agreements for the movement of water. In addition, concerns about the potential long-term environmental and economic development impacts of transfers of water into or out of a basin must also be considered. Emergency interconnections, which exist solely to address short-term events, are an opportunity to provide critical supply redundancy with minimal long-term impact.

Goal: To identify opportunities for new interconnections, for both treated water and raw water, to better serve the region and create a more robust regional water supply network.

Discussion Prompts:

1. Is your system in a position to sell excess water to a neighboring system? If not, will it be in the future? If so, in what estimated timeframe (5-, 20-, or 50-years)?
2. Have you applied for/obtained a diversion permit for an interconnection? If so, did you utilize the general permit or individual permit, and what was the biggest obstacle to obtaining it?
3. Do you hold a Sale of Excess Water permit? If so, what was the biggest obstacle to obtaining it?
4. Are you planning or do you anticipate constructing interconnections or projects of a regional nature that will involve your system? If so, what will the primary purpose of the project be (interconnect owned systems, sell water, purchase water, one-way emergency interconnection, two-way emergency interconnection, reducing environmental impacts of existing sources, etc.)? If so, what infrastructure will be needed (e.g. pump station, pressure reducing valve, etc.), and in what estimated timeframe (5-, 20-, or 50-years) would the interconnection be constructed?
5. If you have an interconnection with another system, what lessons have you learned about negotiating interconnections? Who are the key players at the utility, local, and state level who need to be involved in decision making?
6. If funding and/or regulatory approval were not obstacles, are you aware of any local or regional interconnections that would lessen the vulnerability within the region or provide other supply benefits?
7. How could the WUCC assist/promote interaction between interested groups/town planners/etc. in promoting future interconnections?
8. Do you have any other ideas about how interconnections might be facilitated in your region for increased flexibility, redundancy, and/or reducing environmental impacts associated with use of specific sources?

Integrated Report Module #12

Topic: Impacts of Climate Change

Genesis: Climate change was raised in the Water Supply Assessment under the topic of needs and deficiencies. Specifically, the WSA reflects the following:

*Impacts of Climate Change* – The resiliency of water systems to climate change and natural hazards is a significant concern, particularly given the extensive power outages that occurred throughout the state during Tropical Storm Irene, Winter Storm Alfred, and Hurricane Sandy. Many smaller systems do not have standby power facilities. A DPH study is underway headed by the Connecticut Institute for Resilience & Climate Adaptation (CIRCA) to develop a Drinking Water Vulnerability Assessment and Resiliency Plan for Connecticut that considers the impacts of flooding from extreme weather, drought, and other impacts of climate change on public water systems. Furthermore, the State Water Plan describes changes in water resources due to climate change. Future planning will be necessary to prepare for and respond to climate change. Interconnections may become more important as part of these efforts.

Goal: To understand how climate change could potentially impact water supply sources, distribution infrastructure, and service

Discussion Prompts:

1. What natural hazards could severely impact your system (flooding, severe storms, hurricanes, tornadoes, sea level rise, winter storms, dam failure, etc.)?
2. If you have water supply sources along a stream or river, what protections do you utilize to prevent flooding? How has flooding affected any of your supply sources or associated infrastructure?
3. If you operate a reservoir supply, do you envision any capacity or water quality issues related to climate change and changes in precipitation?
4. Does any part of your service area experience regular flooding? If so, what impact does this flooding have on your ability to provide service to customers? Are any system components affected?
5. Do you have a formal flood management plan for your water system? If so, how often is it activated?
6. Have you specifically evaluated the potential impacts of climate change on your water supply system (e.g. the increasing frequency of severe storms on the risk of dam failure)? If so, what were the lessons learned? What capital projects have you implemented/are you implementing to address the potential impacts of climate change? If you haven’t evaluated the impacts, why not? What assistance, besides funding, would you need?
7. What, if any, concerns do you have relative to climate change in terms of its potential impact on your individual water system components?
8. Do you have an emergency power supply system, or an emergency power plan that would grant you access to a backup power supply during an emergency? What type of fuel is it (e.g., diesel, propane, gas, solar, etc.) and what type of equipment (e.g., generator, solar array, etc.). Can the backup power support all system components? How long could that backup system function?

Integrated Report Module #13

Topic: Impacts of Existing and Future Regulations

Genesis: The impact of existing and future regulations was raised in the Water Supply Assessment (WSA) under the topic of needs and deficiencies. Specifically, the WSA reflects the following:

*Impacts of Current Streamflow Regulations* – Several of the community water systems (CWSs) in the region may experience impactful reductions in reservoir safe yields upon full implementation of the Streamflow Regulations by 2026 or 2027. The regulations will mainly affect mid-sized systems that rely on surface water supplies that are not exempt from the Streamflow Regulations. Future water supply sources may be needed to offset reductions in safe yield. Therefore, implementation of the Streamflow Regulations is believed to be a primary driver for determining the need for future interconnections and new source development across the state. Utilities may also choose to develop and enter into flow management plans with multiple parties as a method to comply with the Streamflow Regulations.

*Impact of Future Anticipated Regulations* – Regulations that affect public water systems will remain an issue for this region as well as for water systems statewide. The total coliform rule (TCR) is one such example. The TCR will lead to proliferation of new and improved treatment systems, and it may lead to abandonment of some water supply wells. Other examples are changes to the lead and copper rule, regulations for perchlorate, and regulations addressing emerging contaminants. If the Streamflow Regulations are modified in the future to include progressive cutbacks of groundwater withdrawals, the adverse impact on available water will be significantly felt in the region and statewide. These and other as-of-yet unknown future regulations can be costly to implement, maintain, and significantly affect the logistics of operating a public water system.

Goal: To better understand how existing and future regulations may impact regional water systems, plan for such impacts, and engage systems in the draft regulation process.

Discussion Prompts:

1. What existing or proposed regulation(s) pose the biggest challenges to your system?
2. If your supply sources are registered in accordance with the Water Diversion Policy Act, what proportion of your registration do you typically utilize on an average day? On the average day in the maximum month? On a peak day?
3. Will your system be impacted by implementation of the Streamflow Standards and Regulations? If so, have you undertaken analysis to determine the implications on safe yield? If so, what reduction are you expecting? How may the ongoing decrease in per capita water use each year – which affects margin of safety – offset the impacts of stream flow releases in ten years?
4. Are you aware of any other up and coming regulations that would impact your system such as those suggested above? If so, what are they and what effect might they have?
5. What amendments to the WUCC regulations should be considered to clarify the WUCC’s role beyond the initial two year planning process? What clarifications are necessary to ensure proper planning is performed moving forward?

Integrated Report Module #14

Topic: Potential Impacts on Other Use of Water Resources, Including Water Quality, Flood Management, Recreation, Hydropower, and Aquatic Habitat Issues

Genesis: The Coordinated Water System Planning regulations require that the WUCCs consider the potential impacts of the plan on other uses of water resources, including water quality, flood management, recreation, hydropower, and aquatic habitat issues. Additionally, the Water Supply Assessment raises the following concern surrounding coordinated planning:

*Environmental Concerns Associated with Water Withdrawals* – Members of environmental groups and the general public have voiced concern over the potential for environmental impact of water withdrawals from water supply reservoirs and groundwater aquifers. For new withdrawals and for those previously permitted under the Water Diversion Act administered by the Connecticut DEEP, potential environmental impacts are rigorously reviewed. Previously *registered* water diversions, including those for public drinking water supply, did not undergo environmental review; these withdrawals are grandfathered.

Goal: To identify and consider potential impacts of the Coordinated Water System Plan on surrounding resources and water uses

Discussion Prompts:

1. What specific system expansions, upgrades, or modifications do you have planned in the 5-, 20-, and 50-year WUCC planning periods that could potentially cause impact on surrounding resources or water uses?
2. Do you have any recent, ongoing, or planned system modifications that have been evaluated relative to their potential environmental impact and other impacts? If so, through what process (diversion permit, 401/404 Water Quality Certification, FERC review, etc.)? What expected level of impact (none, negligible, minor, substantial, etc.) on other uses of water would these activities have, and over what time period (temporary, long-term, permanent, etc.)?
3. If you have taken steps to reduce the environmental impacts of a withdrawal or specific diversion, please share your approach and the benefits or impacts of such actions.
4. Under what circumstances have you evaluated the environmental impacts of registered withdrawals? An example could be during the permitting process for a new interconnection that would use the registered sources. If you have ideas about how the environmental impacts of a registered sources should be evaluated, or when such evaluation should occur, please share them.

Integrated Report Module #15

Topic: Regional Population and Service Ratio, Consumption by Demand Category, Safe Yield, Excess Water

Genesis: The Coordinated Water System Planning regulations require the following data:

* Population and consumption projections for 5-, 20-, and 50-year planning periods for the public water supply management area as a whole and for each municipality within the area
* Projected population, historical and projected water demand by user category (e.g. residential, commercial, industrial, institutional, municipal, and unaccounted-for water) for 5-, 20-, and 50-year planning periods for each public water system’s exclusive service area and for the combined service areas
* Determination of the amount and percentage of projected population within each municipality within the public water supply management area to be serviced by public water supplies for 5-, 20-, and 50-year planning periods
* Sources of supply, safe yield, and amounts of purchased water available for 5, 20, and 50-year planning periods for each public water system’s exclusive service area and for the combined service areas

Goal: To develop a consistent database for existing and future planning periods.

Discussion Prompts:

1. If applicable, what is the date of the most recent water supply plan update for your system, and has it been approved by DPH? When do you expect to complete your next plan update?
2. What is the anticipated impact of future population projections for your exclusive service area on the water resources available to your system? What additional water, if any, is needed to serve your system for the average day, maximum month average day, and peak day demand scenarios?

Integrated Report Module #16

Topic: Compatibility with Local, Regional, and State Plans

Genesis: The Coordinated Water System Planning statutes and regulations require an assessment of the compatibility of water system plans with local, regional, and state plans. In most cases, these are the municipal Plan of Conservation and Development, the regional plan administered by the local Council of Government, and the State Conservation and Development Policies Plan. In some cases, there may be other plans to consider such as economic development plans, hazard mitigation plans, area plans (e.g. Town Center South Plan in Guilford), and municipal development plans (e.g. River Street MDP in New Haven).

Goal: To better understand the compatibility of local, regional, and state conservation and development plans relative to water system planning and create a platform for planning discussions moving forward

Discussion Prompts:

1. Is your current supply source(s) and distribution system service area compatible with local, regional, and state planning goals? If not, how so? Have you reached out to local, regional, and state entities to identify the inconsistency? If so, what was the response?
2. Please describe your process for discussion of future service plans with applicable municipal, regional, and state planning entities.
3. Are your future identified sources and/or future service area expansions compatible with local, regional, and state planning goals as established in plans of conservation and development? If not, how so? Have you reached out to local, regional, and state entities to identify the inconsistency? If so, what was the response?