

# **Managing Water in Connecticut**

## **A Report on the Study of Water Resources Planning in the State**

In accordance with Section 3 of Public Act No. 07-4 of the June Special Session

An Act Implementing the Provisions of the Budget Concerning General Government

June 2010

Prepared by the Office of Policy and Management  
for the General Assembly's Energy and Technology and Appropriations Committees

## Table of Contents

	<u>Page</u>
Introduction	2
Water Resources Planning in Connecticut, 2010: The Big Picture	4
State Drought Plan and Model Water Use Restriction Ordinance	8
Conservation Programs, Conservation Incentives and Rate Making	12
Freedom of Information (FOI) Regarding Water Supply Plans	15
Water Company Lands	16
Conclusion	17

## Introduction

Many of Connecticut's laws, policies and funding decisions influence the supply of and demand for the state's waters. Like other states, Connecticut has dealt with water resource issues as they've arisen and, over the years, has solved some problems but not others. Section 3 of Public Act 07-4 of the June Special Session (the Act), directs the Office of Policy and Management (OPM) to report annually on the study of water resources planning in Connecticut. The Act specifically requires OPM to:

- 1) Review and prioritize the recommendations and the goals of the Water Planning Council developed prior to October 1, 2007;
- 2) Compile information from other reports or studies regarding water resources planning in the state;
- 3) Establish a mechanism to perform an in-depth analysis of existing statutes and regulations of the Department of Environmental Protection, the Department of Public Health and the Department of Public Utility Control for areas of overlapping and conflicting or inefficient procedures;
- 4) Review and summarize other states' regulatory programs and structures, relating to water resource planning, including, but not limited to, their approaches to water allocation;
- 5) Identify processes and funding needs for the evaluation of existing water diversion data and approaches to basin planning projects and coordinate water data collection from, and analysis among, the Department of Environmental Protection, the Department of Public Health, the Department of Public Utility Control, the Office of Policy and Management and the United States Geological Survey, and recommend supplemental data collection, as appropriate;
- 6) Evaluate existing water conservation programs and make recommendations to enhance water conservation programs to promote a water conservation ethic and to provide for appropriate drought response and enforcement capabilities; and
- 7) Identify funding requirements and mechanisms for ongoing efforts in water resources planning in the state

The Water Planning Council (WPC) is comprised of the Secretary of the Office of Policy and Management and the commissioners of the Department of Public Utility, the Department of Environmental Protection and the Department of Public Health, or their designees. The WPC was established pursuant to Public Act 01-177 "to address issues involving the water companies, water resources and state policies regarding the future of the state's drinking water supply."

To assist it in its mission, the WPC established the Water Planning Council Advisory Group (WPCAG). The WPCAG is a group of people representing a wide range of interests and expertise in water resources. They research and provide recommendations to the WPC and, during the past year, the WPC requested the WPCAG to establish workgroups to consider

various issues raised by OPM's previous report. The WPCAG currently has the following five workgroups:

- a) State Drought Plan and Model Water Use Ordinance
- b) Conservation Incentives and Rate Making
- c) Freedom of Information (FOI) Regarding Water Supply Plans
- d) Water Company Lands
- e) Conservation Programs – Outdoor Use

The workgroups are currently researching and discussing their assigned topics and are at varying stages towards completing their findings and recommendations. Those findings and recommendations are expected in the coming months and will influence the state's future water resources planning efforts.

Rather than organize this report in accordance with the seven tasks specified by Section 3 of the Act, the workgroup topics form the framework of this report. Because of some common themes in their work, this report combines the *Conservation Programs – Outdoor Use* and the *Conservation Incentives and Rate Making* topics to provide a holistic overview. Each workgroup addresses some of the ACT's seven tasks and it is hoped that, by framing the discussion around specific issues, this report will provide a more cohesive review of the state's water planning efforts and needs.

## Water Resources Planning in Connecticut, 2010: The Big Picture

In October, 2009, the Department of Environmental Protection (DEP) proposed new stream flow standards and regulations in response to Public Act 05-142, An Act Concerning the Minimum Water Flow Regulations. That initiative, as widely expected, has become the focus of debate regarding the future of the state's water resources. It has brought attention to contradictory viewpoints regarding the state's water resources and to the competing demands for that water.

The Office of Policy and Management (OPM) prepared this report as the DEP received and began to review public comments on the proposed regulations. Even before the proposed stream flow regulations can affect the flow of a single stream, they might very well lead to the resolution of some critical issues OPM described in its previous report on water resources planning. In particular, OPM is hopeful that the regulation review process and the final regulations will result in a systematic assessment of the legal framework for water resources management, the development of standardized methods for measuring and reporting flow from diversions and, in the end, yield data necessary for effective basin planning.

Connecticut's original stream flow regulations only applied to streams that DEP stocks with fish. Not only were relatively few of the state's streams offered protection, but the degree of protection provided to even those few streams is less than what DEP now considers necessary to maintain the aquatic habitat. The 2005 public act directed DEP to develop regulations encompassing all the state's rivers and streams and to strike an appropriate balance between the needs of humans with the need to sustain desired aquatic habitat. Such a proposal is inherently controversial as many water users who never before faced any significant limitation on their diversion of the state's water are faced with possible limits.

The stream flow regulation proposal arose in part from widespread concern about the profound environmental consequences that water diversions can cause, to the point of drying water bodies and wetlands. Climate projections, furthermore, suggest the problem will grow worse. Average precipitation is actually predicted to increase, but human and natural demands for water would also increase. Precipitation is predicted to be more erratic, with drought being more frequent and more severe. Even if the state's system of water allocation were thought to work well enough now, despite its flaws, we cannot rely on it in the future.

Efficient water allocation is essential to the economic, environmental, and social well being of the state. Those three factors are known as the three pillars of sustainability and the American Water Works Association addresses them in its Triple Bottom Line (TBL) of sustainable water utility performance. By considering those factors simultaneously, the TBL approach maximizes the economic, environmental and social benefits of water resources while minimizing the harm resulting from any particular use or non-use of water.

*It makes sense that we'll come to a point where we're sustainable. The question we must ask ourselves now is how long it will take and what we will lose in the process?*

Peter Raven  
quoted by in the Los Angeles Times, 5/7/2010

The human use of water is a priority of the state's water planning efforts, but it is important to keep in mind how little of the water supplied by the state's water utilities and private wells serves essential human needs. Indoor water use is declining and that is attributed to regulations and educational efforts requiring or encouraging the use of low-flow fixtures and appliances.

Despite that success, more water continues to be used to flush toilets and wash clothes than is actually consumed by people, so continued conversion to low-flow fixtures and appliances will help to further reduce indoor water use.

In residential areas outside the state's compact urban neighborhoods, demand for water rises dramatically with the lawn watering and other outdoor water uses of summer. A family of four typically uses less than 2,000 gallons of water per week for all indoor uses. If they have a ¼ acre lawn, however, they will use an additional 6,700 gallons of water each week that they water the lawn with the recommended 1" of water.

Much of the state received ample rain during the summers of 2008 and 2009, which reduced the amount of lawn watering. This contributed to serious cash-flow problems for a number of water companies, since their rates assume that a certain amount of lawn watering will occur. With the continued installation of automatic lawn irrigation systems, some water companies might experience significantly stress on their water sources and distribution systems resulting from increased levels of demand the next time there is a prolonged dry period in summer.

A community whose water supply strains to meet peak summer demands faces the prospect of water use restrictions, inadequate fire protection and high costs to develop more supply and treatment capacity. Given such uncertainty, a business considering expansion or a new location might be inclined to look elsewhere. Such a community also stresses the environment, since stream flows and groundwater levels are already low at times of peak seasonal demands. Connecticut's environment is one of the state's major attractions, so environmental harm resulting from non-essential seasonal water demands should not be taken lightly.

There are surprisingly few incentives to conserve water in Connecticut's current system of water allocation. Given the nature of the water utility business, a large proportion of a water company's day-to-day costs are fixed. Those who divert the state's waters do not pay for each gallon of water diverted, so there is little cost for taking more and little to be saved by taking less. Rate-making has tended to reflect the water industry's cost structure, thereby shielding customers of water utilities from a price signal that might otherwise encourage conservation.

Now that limits to the supply of water can no longer be ignored, the inherent flaw underlying traditional rate structures is obvious. Thinking back to the Triple Bottom Line approach, traditional rate structures fail because they only address economic and social needs, without accounting for the resulting environmental costs. Water rates have not included the full cost of the resource being used and, in fact, routinely fail to even recover necessary long-term infrastructure costs.

Aging water system components can be expected to fail at an increasing rate; not only affecting water service, but also disrupting neighborhoods and roads subject to major excavation projects at a moment's notice. With a history of underfunding infrastructure replacement, water utilities around the country appear to be counting on massive federal and state government subsidies. It is important that rates be adequate to sustain water systems without outside support.

Changing development patterns in the decades following World War II have also placed added stress on both public water supply sources and their expansive delivery systems. Such systems were originally constructed to convey water from sparsely populated rural areas to more densely populated urban areas. However, the population of many urban areas has declined since that time, along with their commercial and industrial water demands, while many outlying suburban and rural areas have experienced significant growth. This dramatic shift in population has

created demand for new water system infrastructure in less densely populated areas, aided in part by rate structures that have traditionally encouraged new water service extensions while deferring the maintenance of existing infrastructure.

Rural areas can typically accommodate some growth without public water service. However, even those less intensive land use changes can affect local aquatic habitats and reduce the quantity and quality of water available for delivery to the existing public water service areas that accommodate much of the state's population and economy. Development in traditional water source areas not only affects the hydrologic cycle, but it also presents additional opportunity costs to society with regard to how, when and where water resources are used.

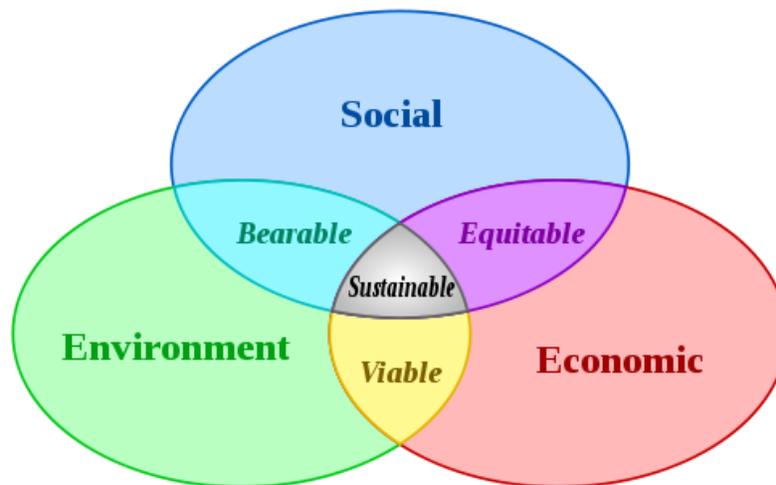


Figure 1

Johann Dréo

[http://commons.wikimedia.org/wiki/File:Sustainable\\_development.svg](http://commons.wikimedia.org/wiki/File:Sustainable_development.svg)

Figure 1 shows different aspects of the sustainable management of the state's water resources. Although there have been proposals to consolidate all water resources responsibilities in a single agency different agencies have different roles according to their enabling statutes. For example, DEP and DPUC fit reasonably well into the Environment and Economic domains of Figure 1, respectively, while DPH, for the most part, can be considered to occupy the social domain. According to this simplification, DPH and DPUC interact with the goal that the use of water is economically and socially equitable; DPUC and DEP interact with the goal that the use of water is economically and environmentally viable; and DEP and DPH interact with the goal that the use of water is environmentally and socially bearable. When all those concerns are addressed together, water use can be considered sustainable. Water resources management is much more complicated, with many other players participating, but the diagram helps show the tension between different perspectives and the importance of each.

Looking at the economic domain, as an example, the economic ramifications of stream flow regulations will be addressed by DPUC in the same fashion as it addresses other state requirements, such as DPH's monitoring and treatment requirements. In its public comments regarding DEP's stream flow proposal, DPUC points out that water rates are already subject to

increases as water companies attempt to catch up with needed water system rehabilitation. DPUC notes that the proposed stream flow regulations will impose an additional financial burden and that it will be necessary to choose between the initiatives if the combined impact on rates is too much for the rate-payers to bear.

It will be a challenge to rehabilitate aging water system infrastructure because water company customers are accustomed to water rates that do not fully recover system costs. Correcting the historic underfunding of water system maintenance will be unpopular and may be especially difficult for municipal water utilities because of legal and political constraints. If rates do not generate the funding needed to maintain system infrastructure, the only alternative is to look for taxpayers to subsidize water utility customers by paying costs not covered by rates. It is an economic benefit for those who enjoy the lower water rates, but doing so raises equity concerns and, by keeping prices artificially low, encourages the excessive use of water.

Different uses of the state's water have different benefits and costs, which must be measured on the basis of economic, environmental and social criteria. Similarly, the diversion of water from some sources has a higher cost than from other sources and, again, economic, environmental and social factors must be considered. It will be a challenge to change the water allocation process because there will be winners and there will be losers. Difficult decisions must be made in order to create a water allocation process that serves the greater need into the future. People look to the state to resolve water allocation concern and prepare for future stresses because of the state's influence over the quality, supply, demand and price of Connecticut's water.

## State Drought Plan and Model Water Use Restriction Ordinance

One of the WPCAG workgroups is charged with reviewing and recommending changes to the state's Drought Preparedness and Response Plan (Drought Plan) and the state's Model Water Use Restriction Ordinance (Model Ordinance). Past experience suggests that more robust planning and coordination would help the state and its municipalities be better prepared for droughts and other water supply emergencies. Climate projections, furthermore, indicate that droughts and other natural hazards could occur with greater frequency and severity in the future, increasing the risk of water supply disruption. Preparing for such events is critical because of the potential ramifications for the state's citizens, environment and economy.

It was only two years ago that Connecticut emerged from a Drought Advisory declared by Governor Rell in October 2007 as parts of the state experienced serious water supply concerns after several months of below-normal precipitation. Based on the state's experience with that advisory and the experiences of municipalities and water companies with that and other shortfalls, efforts are underway to amend the state's Drought Plan as appropriate.

Water companies and local, state and federal officials have different responsibilities and authorities for taking actions in response to a drought or water supply emergency. The fundamental goal of this workgroup's ongoing effort is to coordinate the responsibility, authority and means for responding to water shortages. In its basic Incident Command System training, the Federal Emergency Management Agency (FEMA) lists factors that impair the response to emergencies:

- *Lack of accountability, including unclear chains of command and supervision.*
- *Poor communication due to both inefficient uses of available communications systems and conflicting codes and terminology.*
- *Lack of an orderly, systematic planning process.*
- *No common, flexible, predesigned management structure that enables commanders to delegate responsibilities and manage workloads efficiently.*
- *No predefined methods to integrate interagency requirements into the management structure and planning process effectively.*

Some of these problems were cited when the Drought Plan was implemented during the 2007 Drought Advisory and during subsequent tabletop exercises. One goal of the current Drought Plan review is to address those limitations. Doing so, however, cannot be a one-time occurrence. As FEMA notes in its National Incident Management System training:

*Preparedness is achieved and maintained through a continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action.*

The preparedness cycle is illustrated in Figure 2.



Figure 2

Federal Emergency Management Agency  
 IS-700.A National Incident Management System (NIMS), An Introduction  
<http://emilms.fema.gov/IS700a/NIMS0102000.htm>

The ongoing evaluation and revision process will complete the cycle for the first time since the Drought Plan was approved in 2003. Future evaluations and corrections should occur more promptly. Fortunately, the state has not experienced a severe drought during recent years, but it is critical that the process works when the inevitable drought occurs. In addition to correcting some inefficiencies within the plan, OPM expects the current update process to establish a system that will keep the planning process active in the future.

It should be noted that the Department of Emergency Management and Homeland Security (DEMHS) produces a related plan, the State of Connecticut Natural Disaster Plan, which was last updated in 2009. The forthcoming update to the Drought Plan will strive for greater consistency with the Natural Disaster Plan because of the degree to which that plan is implemented at all levels of government and the resources available through that plan.

The Natural Disaster Plan focuses on other disasters, particularly floods, severe thunderstorms, hurricanes, tornadoes, ice storms, winter storms, blizzards, and coastal storms. A drought differs from such disasters because, as the state Drought Plan says, “A drought is not a distinct event that has a clearly defined beginning and end.” Although it only uses the word “drought” once, the Natural Disaster Plan does address water supply problems that can arise from other disasters. For instance, the Natural Disaster Plan’s Local Government Situation Report Form provides the following examples of water supply problems that might arise from other disasters:

<b>Minor</b>	<b>Significant</b>	<b>Major</b>
<i>Water Supply Loss of private wells due to minor power outages.</i>	<i>Temporary loss of a major public water supply due to contamination/damage to distribution system.</i>	<i>Extensive damage to a public water supply, rendering it unusable for several days or longer.</i>

The underlying causes are different, but the Drought Plan must anticipate similar problems. Droughts do differ from other disasters in significant ways, but emergency management and communication procedures specified in the Drought Plan should, to the extent possible, be based on those established in the Natural Disaster Plan.

The WPCAG drought workgroup is discussing the Drought Plan's criteria for determining the drought status and its trigger points for upgrading or downgrading that status. Connecticut uses the same criteria used in many other states, which are based on readily available data compiled primarily by federal agencies. Although Connecticut is a small state geographically, there are significant gaps in the data collection network and they make it very difficult to accurately assess regional variations in drought conditions.

In addition to complexities that arise because of geographic variations in precipitation, water companies experience drought differently, depending on their water sources, infrastructure and demand. Water companies, therefore, establish their own drought plans and base their drought triggers on criteria unique to their circumstances. Consequently, their plans and trigger points can differ markedly from those of the state and of neighboring water companies. It is important to coordinate state and municipal drought responses with water company drought plans.

In all likelihood, there will be times when either the state, a municipality or a water company will have reason to seek a higher level of drought response than the others might desire. For that reason, drought plans should allow each entity to adapt to the needs of the others. A member of the WPCAG drought workgroup described a situation in which a town wanted to continue drought restrictions even after reservoirs serving the area's water company were replenished by heavy rains. The water company had ample water for its customers, but other residents, who depended on private wells and fire ponds, were still affected by drought. Allowing some residents to use water without limitation while others needed to restrict use would have complicated communications and enforcement. Although the investor-owned water company lost revenue because of the restrictions, it recognized the town's need and cooperated even though its own drought plan would have allowed its customers to use water without restriction. The roles could be reversed the next time.

Many conflicts can be anticipated, either based on past experiences or through mock exercises. To the extent possible, such problems should be addressed through a continuous planning process. Connecticut municipalities rely on multiple sources of water, including private wells, private surface or groundwater diversions, and public water companies, to serve their residents and businesses. Any town or water company can face a situation in which water source or infrastructure limitations temporarily prevent the supply of water from satisfying the demand. In areas relying on private wells, the problem might be revealed by low well yields or dry fire ponds. Water companies have established criteria for implementing their own drought response plans, but almost all lack the authority and means to enforce restrictions on water use.

Because of the authority vested in municipal officials and the uniqueness of each town's water supply, municipalities are in the best position to develop and enforce water use restrictions. Such restrictions can be formalized as a municipal ordinance enabling a municipality to ensure that a fair and effective process exists when a water use restriction becomes necessary. When the demand for water outstrips the supply, a municipality with a well-crafted water use restriction ordinance will be able to safeguard the availability of water for its most essential needs, whatever the source of the water. Water companies serving the town must participate in developing such an ordinance and an ordinance's effectiveness can be enhanced if it is coordinated with those of neighboring towns or other towns served by the same water company.

The state believes each town should assess the potential benefits of a water use restriction ordinance and determine whether to undertake the process of enacting one. To the best of OPM's knowledge, no town has used the state's 2008 Model Ordinance to develop a new ordinance. OPM believes this has happened at least in part because of timing; chief elected

officials and local health directors who received the model ordinance were soon confronted by the ongoing fiscal crisis and H1N1 flu, respectively, and precipitation has generally been abundant since then.

OPM believes the Model Ordinance would benefit from better-developed guidance information as well as wider distribution. The WPCAG's drought management workgroup has reviewed and discussed the Model Ordinance and, although there is agreement that the model and its distribution could be improved, the workgroup has decided that the state Drought Plan is in need of more immediate attention. The workgroup, therefore, will focus on the state Drought Plan for the time being. The Model Ordinance will not be ignored during this process and deficiencies noted during this time will be corrected, leading to a more user-friendly Model Ordinance that can be available when town leaders can again turn their attention to drought management.

Just about everyone who has worked with or even just reviewed the state Drought Plan agrees that it would be improved if it had a more localized or regionalized focus. It is interesting to note that while most agree that Connecticut should localize the drought decision making process, the State of Georgia has done the opposite. A bill passed there in 2008 limits a local government's ability to impose outdoor water use restrictions stricter than those imposed by the state.

Connecticut's state Drought Plan does mention that, "Droughts can vary widely in duration, severity, and local impact", but there is little in the plan to target responses according to variations in local impact. There are exceptions. In its earliest stage, a Drought Advisory, the Drought Plan notes that the Commissioners of DPH, DEP and DPUC are to "Urge residents to cooperate with local utilities as conditions may be worse in specific areas requiring greater efforts in accordance with adopted utility plans." Absent a declaration by the Governor and the resulting media attention, however, achieving the hoped-for cooperation will be difficult in the vast majority of towns which lack a water use restriction ordinance.

Local variations are also mentioned in the second stage of the drought plan, a Drought Watch. During a Drought Watch, DPH is assigned to "Monitor implementation of individual water supply plans and determine if local/regional water supply situation warrants a targeted emergency declaration." That section is inadequate for addressing local drought variations because it is not unusual for one area to face localized drought conditions while other areas are relatively normal. Currently, DPH is only directed to do such monitoring and to consider a targeted emergency declaration if the entire state is in the Drought Watch stage.

The quoted sections of the Drought Advisory and Drought Watch protocols are especially inadequate if the Drought Plan is to address private wells. Drought Advisories and Warnings only address water utilities. The question of private wells will also be an important issue for the Model Ordinance. Not only can private wells have a significant effect on the availability of water to neighbors, but their presence complicates the enforcement of water use restrictions in areas also served by a water utility.

The WPCAG drought workgroup will evaluate these and other issues regarding the state Drought Plan and provide its recommendations to the WPCAG. After reviewing the workgroup's recommendations, the WPCAG can provide a set of recommendations as requested by the WPC in 2009. At that point, the WPC can convene the state's Interagency Drought Workgroup for the final consideration and implementation of those changes.

## Conservation Programs, Conservation Incentives and Rate Making

Water conservation is a key component of the state's water planning efforts. Encouraging conservation, however, requires more than just asking people to turn off the water when brushing their teeth. Many of a household's largest water uses are determined by the home's fixtures, appliances and landscaping and most people have little awareness of how much water is used for different activities.

Water bills do not increase significantly with increased use or decrease significantly with conservation; thus providing little incentive to change behavior or to invest in water-conserving appliances. Complicating any conservation effort is the fact that the rates charged by a water utility are based on historic consumption patterns and conservation measures reduce a utility's revenues more than they reduce the utility's costs. Conserving water requires a multi-faceted approach.

Because of how their rates are structured, above normal precipitation during lawn watering season has the same effect on a water company's finances as a slow holiday shopping season has on a retailer's bottom line. It is the season of peak sales and water company finances suffered because of regular rains during the summers of 2008 and 2009. Water companies, furthermore, are reporting that their customers' indoor water use is gradually decreasing, perhaps as households replace old fixtures and appliances with new, water-saving models, which are either required by state law or otherwise have come to dominate the market.

In the 2010 WPC report, the WPCAG noted that, "...it is important to explore how to ensure rates are designed to give customers appropriate price signals and generate adequate revenues to maintain operations and investments in water systems even with declining customer usage." Climate projections predict that droughts may be more frequent and intense in the future. Previously exempt water diversions, furthermore, could be subject to the future stream flow regulations.

Water conservation was addressed by one of the original WPC workgroups in 2002 but, as pointed out in OPM's 2010 water planning report, there have been a number of changes since that time. Therefore, the conservation rates and incentives workgroup is considering past recommendations, recent innovations, as well as changes being experienced in the water industry today. As the WPCAG said in the 2010 WPC report, "revisiting opportunities for additional water conservation programs is particularly timely given the pending streamflow regulations and the importance of conservation to reduce demands on water resources and/or delay or mitigate the need for additional supplies."

Solutions to water shortfalls can be roughly divided into those that increase supply, known as supply-side solutions, and those that reduce demand, known as demand-side solutions. Even with heightened environmental awareness and stronger regulations, there still are strong incentives to expand existing sources and develop new ones rather than conserve the water from existing supplies.

*We buy too little efficiency and too much supply*

Water Efficiency: A Resource for Utility Managers, Community Planners, and Other Decisionmakers  
Rocky Mountain Institute, 1991  
available at <http://www.p2pays.org/ref/12/11219.pdf>

One factor that encourages supply-side over demand-side solutions is known as the payback gap. Supply-side investments, such as new dams and wellfields, are undertaken by water companies, not by individuals. Demand-side investments, on the other hand, are typically made by consumers. A payback gap occurs because a water utility's customers expect a much more rapid payback from their investment in conservation than a utility ever would expect from an investment in increased supply.

A utility investing in a new water source can accept a payback period of decades and knows the costs will be recovered through its rates with a predictable rate of return on its investment. Residential customers, on the other hand, typically will not invest in improved efficiency unless they expect payback within 1-2 years. Such a short payback requires an extremely large return on investment and that unreasonably high expectation prevents many cost-effective conservation improvements. The result is that costly supply-side solutions are favored over less expensive demand-side solutions. The payback gap can be so large that water companies can save money if they avoid developing new supplies by offering rebates and free installation of water-conserving fixtures. Some states experiencing increased demand for water because of growing populations require such an approach.

Although there are strong incentives to increase the supply of water rather than to reduce demand, there also are challenges to doing so. In particular, there is a lengthy permitting and review process even without the proposed minimum stream flow regulations. For example, the Connecticut Water Company began the actual work of raising the dam of its Killingworth Reservoir in 2004, but planning had begun decades earlier. Once the company began the actual process of seeking the necessary local, state and federal permits, a number of years were necessary to obtain those approvals.

Regardless of whether a new or expanded source will be surface water or groundwater, increasing the supply of water requires a commitment to long-term, fixed infrastructure that will impose future costs, no matter what future demands are. Some Connecticut water utilities have already experienced that: they developed sources and infrastructure for large industrial customers that subsequently reduced their water consumption or shut down operations. Utilities and their remaining customers bear the costs to maintain the greater infrastructure or bear the risks of deferring maintenance. Some seek new demands for their supply, even to the point of municipal water companies extending water service to foster development beyond their municipal border that might otherwise have located within their municipality. Municipal utilities have little choice because of their status as separate enterprise funds which must pay their own way, but doing so might forego future jobs and property tax revenues in exchange for the low price of water.

By managing demand before increasing supply, a water company and the community it serves need not commit to the cost of capacity that might not be needed. Other states have reached their crisis points before Connecticut and have been developing better demand management tools. Although we might think of those as only being necessary in arid regions, they have proven necessary in Seattle, Florida and other places that would seem to get ample precipitation. The Southwest Florida Water Management District has described the role of rate structures in conservation. It notes that a well-designed rate structure can:

- *Reduce water consumption without negative impacts on utility revenues;*
- *Reward customers for making cost-effective changes in water appliances and behavior through greater savings;*
- *Target inefficiency in discretionary water uses such as landscape irrigation;*

- *Delay costly water supply expansion projects; and*
- *Avoid financial hardships on low-income customers*

Southwest Florida Water Management District  
<http://www.swfwmd.state.fl.us/conservation/waterrates/>

The basic premise of a conservation rate structure is that the price of water should increase as a customer uses more water. The price of water for essential needs can continue to be the same, if not lower than it had been. A conservation rate structure, however, requires careful design to ensure that it is aggressive enough to encourage conservation while keeping water affordable for essential needs and not harming water companies. It is not a simple process.

An additional concern raised by conservation initiatives is that, if a utility seeks new customers for water freed up by previous conservation efforts, it is at greater risk during subsequent droughts. This is a concept known as hardening of water demand. Customers who have already eliminated their least critical water uses have less discretionary water use that can be reduced in the next drought. If new customers are added to use the water saved by existing customers, there is less slack in the system during subsequent droughts. In no way does this mean that conservation increases the risk of drought; it only means that careful consideration is required before adding new demands to a system in response to the success of previous conservation efforts.

## **Freedom of Information (FOI) Regarding Water Supply Plans**

The newest of the WPCAG workgroups will assess security concerns regarding utility water supply plans. The workgroup will begin meeting after the current legislative session.

Water supply plans are currently subject to strict requirements restricting access to information necessary for all facets of water resources planning. Those restrictions were enacted by a series of public acts in 2002-2003 that were initiated after the terrorist attacks of September 11, 2001. The more onerous restrictions resulted from the later bills, including language added in a 2003 budget implementer bill. The restrictions form a significant impediment to participation in water resources planning by those who don't have direct access to those plans, which is limited to water companies, their consultants and government agencies.

The current system has been criticized by environmental organization, state agencies and others, without there being any organized effort to assess the problem and offer solutions. OPM's previous water resources planning report highlighted this as being one of the most significant planning deficiencies. The WPCAG has had some preliminary discussions of the options and broad participation is expected.

## Water Company Lands

The Water Planning Council Advisory Group (WPCAG) assigned the Water Company Lands workgroup to assess whether water company lands have adequate protection. Water companies often own very little of the land around their water sources and the state classifies the land they do own based on how important it is to the protection of water quality.

Class I land is considered the most critical and, in general, is nearest to water supply sources or has conditions that make it especially sensitive. It is important to recognize that this classification only applies to land owned by a water company and not to land owned by others. Protections for Class I lands do not rely on specific prohibitions, but instead more broadly require DPH to protect the adequacy and purity of the water supply.

Class II land is the remaining land within the watershed that is not Class I land, as well as land outside the watershed that is within 150 feet of a reservoir or of streams flowing to one. Protections for Class II land are more prescriptive than Class I land, listing specific uses that are prohibited. The different approaches to classifying and protecting water company land have led to questions as to whether an activity specifically prohibited on Class II land might actually be allowed on Class I land. The combined amount of Class I and Class II land in Connecticut is approximately 110,000 acres. Class III land comprises all other water company land that is not classified as either Class I or Class II land. This land is outside the watershed and more than 150 feet from a reservoir or a stream that feeds it.

Questions regarding the public water supply watershed land not owned by water companies also come up a lot. DPH and water companies can submit comments to local land use commissions that are considering applications that might have an impact on water supplies, but there is a concern that such comments do not carry much weight. The workgroup decided to seek feedback from the Connecticut Water Works Association regarding watershed land protection options and how town commissions can do better.

Restrictions regarding the sale of water company lands are also important. In part, that is because of a question of what is required when a water company sells land to the state for protection as open space. But there is a broader concern because of impending stream flow regulations. If an existing or potential diversion is restricted, a water company might decide that an existing or potential water source is no longer viable and might be inclined to abandon the source and sell land it owns to protect that water source. Water companies might also seek to sell off-watershed land to pay the costs of coming into compliance with the minimum stream flow or other regulations.

The state was in a similar situation in the 1970s, when a number of land sales were proposed to fund public drinking water system improvements necessitated by new requirements for treatment. Stream flow regulations could likewise have a significant impact on lands many communities view as being protected open space. Concerns regarding the protection of water company land or of water supply watershed land in general are intertwined with concerns about the protection of open space.

## Conclusion

Protecting the quality and quantity of water available in the state is important, but it is especially critical when one considers the projections in the water supply plans prepared by the state's privately-owned and publicly-owned water companies. Many utilities report that existing supplies will be unable to meet the projected demands of their customers in 50 years, even before factoring in the proposed stream flow regulations or climate change projections.

Each of the workgroups previously described in this report is influenced to some degree by the impending stream flow regulations, since it is a factor that influences practically every aspect of water resources planning. The allocation of water among economic, environmental and social purposes is controversial everywhere.

*Apportioning this finite resource among cities, farms and the environment will require well-informed discussions, conducted responsibly and in good faith, and thoughtful investments in conservation technologies.*

*A perfect opportunity, in other words, for political posturing.*

Michael Hiltzik, referring to water allocation in California  
"Deceptive arguments are being made in California's water wars"  
*Los Angeles Times*, March 14, 2010

The water companies affected by the proposed regulations are a diverse group, with large differences in size, ownership, land holdings and water availability. They are highly visible and, more so than most other diverters, measure and can account for the amount of water they divert. However, they have little direct control over the ultimate use of the water they divert and have regulatory obligations to supply enough water to satisfy that demand.

When considering the supply of and demand for the state's water, there is a temptation to focus on the largest diversions, such as the registered or permitted diversions of the state's water utilities. But water is also diverted for power generation, agricultural and recreational irrigation, industrial purposes and other reasons. Even private wells are a major consideration, since they serve more than 500,000 state residents and can have a significant impact on the availability of water in some places.

Until the stream flow regulations are finalized and the workgroups are better able to address comprehensive long-term strategies for the management of water resources in Connecticut, near-term efforts will continue to focus on water conservation strategies and drought planning and mitigation efforts. The reason is simple; less demand for the state's water reduces concerns about allocation, environmental degradation and the need for additional sources of supply. A robust drought planning and mitigation effort can prevent a frantic search for water and ecological damage to over-allocated waters. It also reduces the threat of revenue shortfalls that water companies, whether private or public, might face if mandatory water restrictions should become necessary.

The diversion of water is not the only way we affect the availability of water. Development creates impervious surfaces, such as roads, roofs, driveways and parking lots, and makes other changes that accelerate drainage and reduce the recharge of groundwater. Flow in streams becomes even higher during storms and becomes even lower during dry periods. Even without any significant change in the demand for water within a watershed, development will typically

reduce the availability of groundwater and reduce stream flow during the critical late summer/early fall period when flows are at their lowest.

In its report *Stream Flow: The Next Two Decades*, DEP noted the effect of development on stream flow and pointed out that its regulations would not regulate land use. Given the effect of land use on stream flow, inadequate stream flows are not completely solved by a framework that focuses exclusively on water diversions. State support for constructing roads, public utilities, schools and other infrastructure not only has a direct effect on the state's waters; it also fuels private development which can have even more impact. Authority for land use decision-making rests with local boards and commissions, but stream flow impacts should be considered in state funding decisions and adverse effects should be mitigated by the adoption of low impact development (LID) techniques as promoted by DEP.

OPM's most direct influence over water resources planning arises from its responsibility for preparing revisions to the Conservation and Development Policies Plan for Connecticut (State C&D Plan) through a coordinated process with municipalities and regional planning organizations. The State C&D Plan guides state investment decisions in physical infrastructure and natural resources which can influence secondary private development or preservation activities. The stream flow regulations will play an important role in how water resource policies are presented in the next State C&D Plan revision, including appropriate balancing of economic growth and environmental protection and resource conservation concerns.