



Connecticut Department of Environmental Protection

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***Report to the General Assembly on State Water Allocation
Policies Pursuant to Public Act 98-224***

JANUARY 2000

Department of Environmental Protection

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I. INTRODUCTION

The allocation and preservation of water resources in the face of expanding and shifting water demands is an on-going challenge for Connecticut. While the state, through the actions of business and industry, governmental bodies and individual citizens, has made great strides in improving the *quality* of surface water and ground water in the past three decades, there is mounting concern and conflict regarding the *quantity* of water available to meet the state's needs. As Connecticut moves into the twenty-first century, more comprehensive management tools are needed to ensure adequate quantities of clean water for drinking, economic development, recreation, and maintenance of a healthy environment.

Connecticut's existing laws and policies concerning water supply, water management, and water allocation do not yet work in concert to effectively allocate water or plan for the needs of the future. Rather, the existing laws and policies create limited authorities in different government bodies for certain aspects of water supply planning and management, with no unified water allocation policy or water resource management. It is the goal of this report to identify the gaps in those laws and policies and recommend changes to create a comprehensive water allocation policy.

A. Requirements of Public Act 98-224

This report was created in response to Public Act 98-224¹ (Appendix A), which required the Commissioner of Environmental Protection to deliver two reports to the General Assembly before January 1, 2000:

(1) **A Diversion Registration Inventory.** This inventory shall include: (a) an inventory of diversion registrations filed on or before July 1, 1983; (b) an inventory of the withdrawal quantities acknowledged for such registrants; and (c) an identification of those registrations which the registrants plan to use; and

¹ An Act Concerning Water Diversion Policy and a Task Force on the Provision of Emergency Medical Services, Public Act No. 98-224

(2) **A Report on State Water Allocation Policies.** This report shall discuss: (a) the adequacy of state water allocation policies in protecting and preserving the integrity of water resources while providing for public drinking water needs, and (b) establishing a methodology for allocating water for other uses when consistent with protection of such resources.

B. Response to Legislative Requests

In response to the legislative charge, the Department of Environmental Protection (“Department”) convened an in-house work group and continued our participation on the Water Allocation Task Force. The Water Allocation Task Force (“WATF”) is an ad hoc work group of the Rivers Advisory Committee. The WATF has not made final recommendations as of the date of this report. The Department also conducted discussions with the water industry and environmental groups.

(1) **Diversion Registration Inventory.** The inventory is attached as Appendix B. It includes (a) an inventory of 1,875 diversion registrations; and (b) an inventory of the withdrawal quantities acknowledged for such registrations. In response to subsection (c) of Public Act 98-224, appendices D and E provide the results of two pilot studies which investigate the extent to which registrants plan to use registered water within the Quinnipiac River Watershed and the Scantic River Basin. The Department did not have the resources to complete such studies statewide.

(2) **Report on State Water Allocation Policies.** The body of this report addresses the adequacy of Connecticut’s water allocation policies and proposes the development of an effective and comprehensive methodology for allocating water.

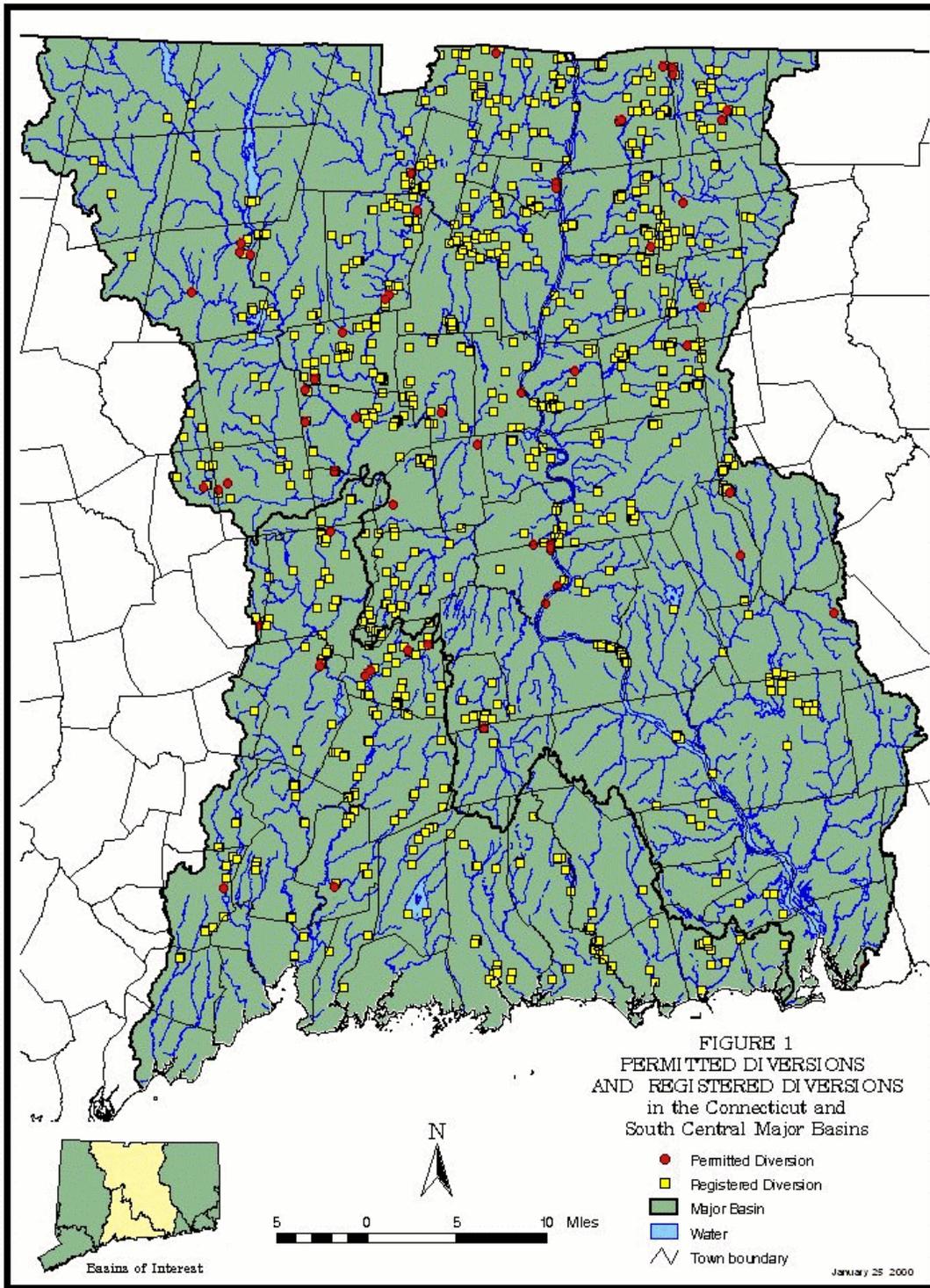
This report describes Connecticut’s water resources, discusses the current water allocation policies which exist in various state agencies, including the Connecticut Water Diversion Policy Act² (the “Diversion Act”), and the challenges involved in incorporating those policies into a comprehensive water allocation system. The report concludes with the Department’s proposals for development of a comprehensive water allocation system, including proposed legislation requiring the Commissioner of Environmental Protection (“Commissioner”)

² Connecticut General Statutes § 22a-365 to 22a-378.

to convene a task force to evaluate recommendations for developing and implementing this system, and to develop legislative authorities. The Department's conclusions are summarized below.

C. Conclusions

1. Under present law, Connecticut does not have a comprehensive water allocation policy. A comprehensive water allocation policy would: (a) recognize the limits on available clean water; (b) prioritize the uses of water within watersheds; (c) divide available water among competing users; and (d) reserve an amount of water for future needs.
2. The permitting program of the Connecticut Water Diversion Policy Act, the primary management tool available to the Department for regulating water diversions commenced after July 1, 1982. Under that program, the Department considers an application for a diversion permit on a "first-come, first-serve basis". The Department evaluates the use of the proposed diversion and attempts to balance the need for that use with existing uses, including the needs of the environment, considering the costs and benefits of that proposal together with those of available alternatives to the proposal.
3. Because the vast majority of Connecticut's water diversions are grandfathered as "registered" and insulated from regulation, the State is currently prevented from developing and implementing a comprehensive water allocation program (See Figure 1).
4. Although Connecticut's water resources are generally sufficient to meet the state's needs, the water is not always available when or where it is needed.
5. Permit applications for non-consumptive activities such as stream channel modifications, installation of culverts, and storm water collection systems have been more readily permitted by the Department in comparison to those for consumptive uses which have the potential to diminish stream flow.
6. The permitting process for consumptive diversions has been a source of frustration for both the Department and the regulated community because of the length of time it takes to process an application for a diversion permit. There are two primary reasons for these



delays. First, the Department and the applicant often lacks essential information about the effects

of proposed and registered diversions on the particular water resource under consideration, resulting in lengthy delays as staff and the applicant attempt to gather such information. Second, the Department's diversion program has never been adequately staffed. Therefore, the Department seeks both the legislative authority to gather necessary data and support for the staffing required to more expeditiously process permit applications.

This report contains recommendations to move the State toward adoption of a comprehensive water allocation policy. Developing such a policy will require legislative changes as well as major planning efforts among the Department, other state agencies and additional stakeholders including the water utility industry, agriculture industry and environmental groups.

The Department has drafted proposed legislation to establish a Water Policy Task Force. This legislation will require the Commissioner to convene a task force consisting of interested parties and stakeholders to evaluate this report and develop legislative proposals to implement its recommendations and to assist in the development of a scientifically sound and predictable water allocation process.

II. CONNECTICUT'S WATER RESOURCES AND WATER USES

A "water allocation methodology" is a means of dividing up available water among multiple users. Such a methodology balances the competing needs for water among all the users. Although Connecticut *as a whole* has sufficient water to meet drinking water needs, environmental requirements, and the demands of other water users, the water is not always available *where* or *when* it is needed. To help determine how water can be provided when and where it is needed, one must understand Connecticut's water resources.



Stony Brook Reservoir, Montville, CT

A. Connecticut's Water Resources

Connecticut enjoys relatively abundant water resources. The state has approximately 5,800 miles of rivers and streams, virtually all of which eventually discharge to Long Island Sound. There are more than 2,300 lakes, ponds and reservoirs, and roughly 15% of the land surface is either inland or tidal wetlands. Ground water is present everywhere in the state, generally at depths of less than 20 feet from the land surface.

The ground water and surface water systems in Connecticut are hydraulically connected. In general, the direction of ground water flow and the location of ground water divides tend to mimic surface topography, coinciding with surface water drainage divides. Ground water generally recharges surface water, providing the baseflow for streams. However, the surface water system can recharge ground water, particularly following extended periods of precipitation or when wells adjacent to a stream are pumped. When large production wells pump steadily for extended periods, the water produced by those wells is water induced directly from the surface water system, and groundwater that would normally recharge nearby surface waters.

The amount of water available for use in ground and surface water systems at any given time is a complex function of numerous factors including but not limited to: precipitation, evaporation from the surface of water bodies, transpiration by plants, runoff across the land surface, and how much water is being withdrawn by existing water users. Connecticut's average annual precipitation is approximately 47 inches, and is fairly evenly distributed throughout the year. Approximately 50% of the annual precipitation is returned to the atmosphere through evaporation and transpiration (collectively called evapotranspiration), 30% runs off into surface water bodies (streams and lakes), and 20% enters the ground water system. Water entering the ground water system moves slowly through the ground, eventually discharging to a surface water body.

The relative percentages of evapotranspiration, runoff, and recharge to ground water vary seasonally over the course of a year. During the growing season, essentially April through September, evapotranspiration rates are high, and much of the precipitation that falls during this period is lost through evapotranspiration or flows to streams as overland runoff. Consequently, precipitation that falls during this period is generally unavailable for recharging ground water due to its uptake in the root zone of plants, and ground water levels decline. When ground water levels drop, the discharge of ground water that provides baseflow to streams also drops, resulting in decreased streamflow. Minimum ground water levels and streamflows are generally observed in late summer and early fall, toward the end of the growing season. During the winter and early spring months, when evapotranspiration is low, more precipitation generally recharges the ground water system, ground water levels rise, and the resulting baseflow discharged to streams is greater. Overall, more water is available in the ground water and surface water resource for use during the winter than during the summer months.

Man's activities also have a direct impact on ground water levels and streamflow. Intensive development results in an increase in impervious surfaces (rooftops and pavement). Impervious surfaces prevent precipitation from soaking into the ground, instead shunting the water into storm drainage systems which often discharge directly to surface water bodies. This causes rapid increases in streamflow (and possible flooding) during precipitation events, and subsequent rapid declines in streamflow once the precipitation event is over. In addition,



Tractor-mounted pump with pipeline to the river, used for an agricultural diversion, Quinnipiac River

withdrawals of water from the surface or ground water systems for uses such as public water supply, evaporative cooling and irrigation, directly reduce ground water levels and streamflow and possibly change hydrology in adjacent wetlands and watercourses. Such impacts can severely reduce aquatic habitat, and may affect instream water quality to the detriment of these resources' ability to support aquatic life. In general, ground water withdrawals along urbanized streams have an additive effect on those resources, further accelerating the periods of extreme low flow. As witnessed during the summer drought of 1999, the combined effects of these various factors which effect streamflow in Connecticut may not be obvious until a drought occurs.

There are also two basic types of watersheds - *regulated* and *unregulated*. Regulated watersheds are watersheds in which stream flows are largely determined by amounts of water released from upstream impoundments. In unregulated watersheds, stream flows are not determined by flow releases from upstream impoundments; rather stream flows in such watersheds are the result of climatic conditions.

B. Water Uses in Connecticut

There are essentially two broad categories of water use: *non-consumptive* and *consumptive*. Non-consumptive (instream) use takes place within a water body such as a lake, river or stream for the purpose of navigation, recreation, construction-related activities, waste assimilation (e.g., assimilation of treated wastewater discharges), fish and wildlife habitats, and flood storage.

Consumptive (out-of-stream) uses involve the withdrawal (or diversion) of water from a ground water or surface water source for human domestic uses (i.e., drinking, cooking, and sanitation), irrigation for agriculture, lawns and golf courses, evaporative cooling, and industrial processes. These uses are consumptive in nature, although a portion of water withdrawn may be returned to a water body located near—though in some cases far away from—the point of withdrawal.

There are 151 public water supply reservoirs and roughly 6,600 public water supply wells in Connecticut. Reservoirs provide the majority of public water, serving an estimated 70% of the population. Public water supply wells serve an estimated 14% of the people. The remaining 16% of Connecticut residents use an estimated 250,000 privately owned wells for their water supply.

It is important to note that “public water supplies” not only provide potable drinking water, but also provide water for other non-potable needs. The United States Geological Survey³ estimates that 49% of water distributed by public water suppliers is used for domestic purposes with the remaining 51% used for either other customer needs such as industrial processes, commercial and industrial cooling, and landscape irrigation, or lost through water leakage from water supply distribution systems.

Other large water use diversions include: fossil or nuclear fuel power plants and other industrial “once through” water cooling systems (water returns to the resource from which it is withdrawn); fossil fuel power plants with evaporative cooling systems (several proposals under review); and irrigation systems associated with agriculture, large lawns and golf courses. The least amount of water use information is available on irrigation water use.

³ United States Department of the Interior, U.S. Geological Survey, Fact Sheet FS-043-98, May, 1998.

C. Competing Uses for Finite Supply

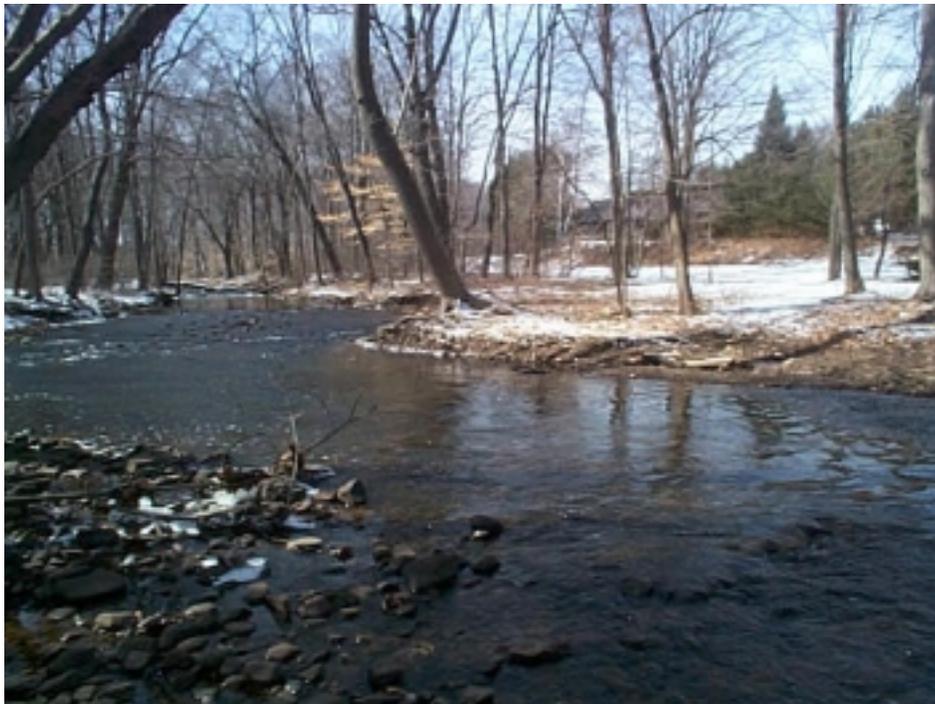
Despite the relative abundance of water resources in Connecticut, there is not always enough water supply to meet the demands of the public in certain areas, particularly during the summer months. For example, during the summer of 1999 some water companies were forced to implement strict conservation measures while others had more than enough reserves. There are a number of factors contributing to this situation, the most important of which are the following:

(1) Seasonal variation in water availability: As previously discussed, both streamflow and ground water levels vary seasonally, and typically are highest during the spring and lowest during the late summer and early fall. Streamflow and ground water levels are a function of recent climatic conditions, and thus the amount of water available for instream and out-of-stream uses also varies with climatic conditions. Unfortunately, a user's need for water may be relatively constant throughout the year (such as the need for industrial processing water), or may be greatest during the time of year when available water is lowest (such as the need for irrigation water). Most water users have limited ability to vary their water needs in response to the amount of water naturally available.

(2) Growth and shifting demand: Connecticut continues to grow and change, and its economic expansion naturally results in changes in *how much* water is needed and *where* it is needed. Residential, commercial, industrial and agricultural development have had significant effects on our naturally occurring surface and ground waters as evidenced by stream flow depletion concerns raised in the Department's 1998 report, "List of Impaired Waterbodies." While population projections prepared by the Office of Policy and Management (draft version 91.2, prepared for public water supply planning purposes) indicate that statewide population growth over the next forty years is not likely to be significant, people continue to leave the cities and move to suburban and rural areas, thereby creating new or additional demands for public drinking water in areas traditionally served by private residential wells.



Mattabessett River, Berlin, CT. Compare streamflows in the summer (above) and winter (below) along the same stretch of the river. Note the bent tree trunk on the right bank of the river, visible in both photographs, for scale and comparison of the width, and the rocks in the streambed for comparison of depth of the river.



In sum, many users with diverse needs are presently competing for an increasingly limited amount of water. Given the extent of existing registrations, some basins simply have no water available for additional diversions. In view of increasing demands, localized water quality problems and periodic water shortages, it is more important than ever to ensure wise and efficient management of our water resources. Economic and social prosperity and the overall quality of life here in Connecticut depend on strengthening our ability to balance the need for water with the capacity and quality of our resources. It is critical that the state plan for efficient future use by assessing past and present supply and demand.

D. Environmental Conditions

The short supply of water in certain areas has caused adverse environmental impacts, as there is often not enough water in particular water bodies to support a healthy fishery, resource, recreational boating, swimming, and other needs. For example, in the water use pilot study of the Quinnipiac River and seven of its main tributaries (see Appendix D), the Department compared baseflow⁴ to maximum authorized diversions;⁵ (see Figure 8, Appendix D). Natural stream flow in these tributaries during dry periods is predominately groundwater recharge. The study show that authorized diversions *exceed baseflow* for Sodom Brook, Broad Brook, and Muddy River and *approach* baseflow for Eightmile River, Misery Brook and Broad Brook. Thus, authorized diversions can significantly depress stream flows of six of the seven main tributaries in the Quinnipiac River watershed during dry periods.

In early August 1999, completely dry stream channels were observed in sections of Misery Brook and Sodom Brook, and, where agricultural diversions were operating, a 50% reduction of flow was observed in the lower Muddy River.

During July and August 1999, Department staff made weekly observations of three sites located on the upper portion of Muddy River, one site located on Patton Brook, and one site located on Roaring Brook, a headwater tributary of the Eightmile River. Throughout the observation period the volume of water remained fairly constant at these sites. Muddy River and

4 As calculated by the United States Geological Survey (“USGS”).

5 i.e., permitted and registered diversions.



Sodom Brook, Meriden, CT, August, 1999. The combined withdrawals from numerous registered diversions within the basin exceed baseflow, causing the stream to go completely dry during the summer

Patton Brook appeared to have standing water conditions, as much of the water present in the channel was retained in shallow runs or pool sections, with little visible water flow between sections. Roaring Brook was completely dry from 7/29/99 through 9/20/99. Additional observations made in September found little change in stream channel width and depth at these sites, although precipitation had resumed and flow levels in other areas had returned to more normal flows. Thus the flows observed in July and August of 1999 may not be solely due to the drought.

III. CONNECTICUT’S PRESENT WATER ALLOCATION POLICIES

As mentioned earlier in this report, Connecticut does not have a comprehensive water allocation system in place. The Diversion Act is the primary tool for water quantity management for the state. However, the Diversion Act is only a piece of an allocation policy. The State Plan for Conservation and Development, Water Quality Standards, Flood Management Act, Water Supply Planning Process, Inland Wetland and Watercourses Act, Aquifer Protection Act, and Endangered Species Act all play a role in managing water use. These various programs and associated statutory authorities and regulations are separate and distinct initiatives, each having its own standards and goals for water use, which are not necessarily consistent with one another, although each must be considered when the Department issues a diversion permit. In addition, the Diversion Act does not clearly empower the Department to prioritize uses or establish reserves for specified future water uses – all of which are essential components of any water allocation methodology.

A. The Adequacy of Connecticut’s Water Allocation Policies

Over the years, Connecticut’s General Assembly and executive branch agencies have attempted to develop a water resource management policy for the state. This policy has evolved incrementally through the adoption of various legislative policies, authorities, agency regulations and planning documents. All have focused on the protection and provision of high quality waters for human consumption. Another overarching theme of these efforts particularly since the early 1970’s is the need to balance the demand for potable water with the needs for the natural environment. Subsequently, environment regulations introduced additional important concerns, which compound the complexity of the state’s long-range water planning efforts.

Connecticut’s water management authorities are distributed principally among four agencies: the Office of Policy and Management (OPM); the Department of Environmental Protection (DEP); the Department of Public Health (DPH); and the Department of Public Utility Control (DPUC), (Appendix G). OPM has a central role in coordinating the activities and actions of the state agencies. Specific water management policies and authorities are typically

implemented in conjunction with the assigned agency's primary mission and principal program focuses. Unfortunately, no one agency is authorized to oversee or implement a single state-wide, comprehensive water planning or management effort.

While §22a-352 of the Connecticut General Statutes directs OPM, DEP, and DPH to prepare and update a statewide plan for the management of water resources for the state, the statute does not, provide guidance on the objectives the plan seeks to achieve. A plan under this authority has been worked on from time to time but never completed. In addition, §22a-352 fails to assign implementation responsibility for the plan once adopted by the General Assembly. This statute also predates several important water permitting and planning statutes presently implemented by DEP and DPH. These include the Connecticut Water Diversion Policy Act (§ 22a-365 through 22a-379) adopted in 1982 as well as the Water Supply Planning Process for individual water companies (§ 25-32d) adopted in 1984 and the Coordinated Public Water Supply Planning Process (§25-33c through 25-33n) adopted in 1985. Any comprehensive water planning initiative would need to integrate data derived from these and other programs adopted in the recent past and specifically assign responsibility for implementing a state-wide plan once it is adopted.

Connecticut does not have a single, integrative water allocation authority or policy. Connecticut also does not comprehensively support a statewide program to coordinate water resource planning. A comprehensive planning program is an essential prerequisite to the creation of a statewide allocation policy. Understanding the overall needs and potential competing uses of water is fundamental to a full understanding of the challenges associated with the allocation of water in the state. A comprehensive planning program would evaluate the broad array of water needs including potable water, waste assimilation, habitat maintenance, recreation, irrigation, industrial uses, power generation, agricultural irrigation, and navigation and would guide state agency actions to minimize water use conflicts.

B. The Connecticut Water Diversion Policy Act

The General Assembly enacted the Diversion Act in 1982, giving the Department limited authority to regulate the withdrawal and use of the groundwater and surface waters of the state.

(1) Diversion Registrations

The Diversion Act included a provision for diversions existing at the time the law was passed to continue without being subject to regulation. This “grandfathering” provision allowed registration of ground and surface water diversions maintained prior to July, 1982. Registrants were required to identify the location, capacity, frequency, and rate of withdrawal of the diversion, and to provide a description of the water use and distribution system. These registered diversions may continue indefinitely, regardless of their environmental effects and their impact on the water needs of others.

The Department performed two pilot projects to examine the status of water use, one through the Quinnipiac River Watershed Partnership (Appendix D) and one through the Tolland County Soil and Water Conservation District (Appendix E). In reviewing the status of water use in the Quinnipiac River Watershed, the workgroup found that of 91 registrations, 39 (43%) are for Public Water Supply Use, 22 (24%) are Agricultural/Irrigation uses, 26 (29%) are Industrial uses, and 4 (4%) are Recreational Uses. The Scantic River report was completed through a contract with the Tolland County Soil and Water Conservation District for a cost of approximately ten thousand dollars. The study found that in the Scantic River basin there are 27 water diversion registrants with 125 registered diversions. Twenty-four of the 27 are agricultural operations, one is a state agency, and two are water companies. The Department has information on water usage for the state agency and water companies, however to obtain the status of the agricultural diversions required individual meetings with agricultural registrants to ascertain the status, frequency and use of registered diversions. The Department does not have the resources to do this statewide.

The Scantic River report indicates a great deal of variability in water withdrawals from year to year depending upon climatic conditions. The studies also reported the existence of unauthorized diversions and inactive or defunct diversion program registrations. Significant staff resources and additional contract monies would need to be provided to complete registration reviews for Connecticut’s major watersheds.

(2) Diversion Permits

The Diversion Act requires a permit for any activity that causes, allows, or results in the

withdrawal from or the alteration of the flow of water, for both surface water (rivers, streams, and lakes), and ground water.⁶ When making a decision on a water diversion permit application under § 22a-373 of the Diversion Act, the Department must consider certain factors, including the environmental effects of the proposed diversion and whether it: 1) is necessary, 2) is consistent with long-range water resource management, 3) is consistent with the state Plan of Conservation and Development adopted pursuant to part I of Chapter 297 of the Connecticut General Statutes, and 4) will not impair proper management and use of the water resources of the State. Applications must be consistent with all other state policies that deal with long-range planning, management and use of the water resources of the state, including the State Plan for Conservation and Development, Water Quality Standards, Flood Management Act, Water Supply Planning Process, Inland Wetland and Watercourses Act, Aquifer Protection Act, and Endangered Species Act. In addition, applicants must evaluate the effect of the proposed new diversion on other water uses, including instream uses, and perform a comparative analysis of the costs, feasibility, and impacts of their proposals in comparison to alternative means of obtaining water, including conservation measures.

The permitting program created by the Diversion Act is an important tool for regulating new water uses. It allows the Department to require the applicant to tailor the level of analysis to the magnitude of potential water use conflicts at the site. Recently, a permit applicant's analysis of comparative costs and impacts resulted in the selection of an alternative that avoided the adverse impacts on a unique wetland which would have occurred if the originally proposed diversion were allowed. That alternative was also considerably less expensive for the applicant.

⁶ Withdrawals of less than 50,000 gallons in any one 24-hour period, and certain other categories of diversions, are exempt from the permit process.

IV. CHALLENGES TO ALLOCATION OF WATER RESOURCES THROUGH THE DIVERSION ACT

At the present time, the Diversion Permitting program is the Department's primary tool for management of water quantity. However, the effectiveness of the diversion permitting program as an allocation system is limited. These limitations result in delay and frustration for permit applicants, and hinder the Department's ability to balance an individual applicant's needs with the competing demands for water.

A. Diversion Act Is Only A Piece Of Allocation Framework

As discussed, significant changes to the Diversion Act can be made to improve the permitting process. However, those changes alone cannot address all of the state's current water allocation problems. The diversion permit applications are considered on a first-come, first-serve basis within the context of existing permitted and registered diversions. The Diversion Act does not contain regulatory authority for prioritizing water among competing users, or for reserving a particular amount for specific future needs, or the environment. All of these other issues must also be addressed within a regulatory allocation framework.

In addition, some of the problems with the diversion program are symptoms of larger problems concerning comprehensive water resource planning. The State's Water Supply Planning Process (CGS §25-32d) requires individual water utilities to plan for existing and future water supply needs for their customers. The Coordinated Water System Plan (CGS§25-33h) ensures coordination and cooperation between water companies with respect to service areas. In these processes the integrity and capabilities of existing water supply sources are evaluated, future water uses are projected, and potential sources of supply are identified, all without the benefit of any environmental assessment. The focus of these processes is the water supply system, not impacts on the resource or other competing water uses. These plans are developed without the benefit of a comprehensive allocation framework, and without data on how much water is available for allocation within a particular basin. It is not until the water is needed and a Diversion Permit application is submitted, generally long after the Water Supply Plans have been developed, that the data necessary for a detailed environmental assessment on the potential

source of supply are collected. At this point in the process, the water company has usually invested considerable capital into a particular site, and it is too late to realistically evaluate alternatives to the proposed supply source. This gap between the water supply planning process and permitting of new water supplies is an on-going source of frustration for both water companies and the Department.

Finally, the water supply planning process applies only to the larger public water suppliers. There is no comparable process for other users. A planning process to consider the future requirements of other consumptive water users is needed.

It is highly recommended that the General Assembly undertake changes to the present diversion program, and develop a water allocation method. Connecticut will then be able to make better and more timely decisions, and to resolve problems cause by registered diversions. This will alleviate the high level of frustration currently experienced by permit applicants and the Department's staff in the length of time it takes to process permits.

B. Insulation of Registrations from Regulations

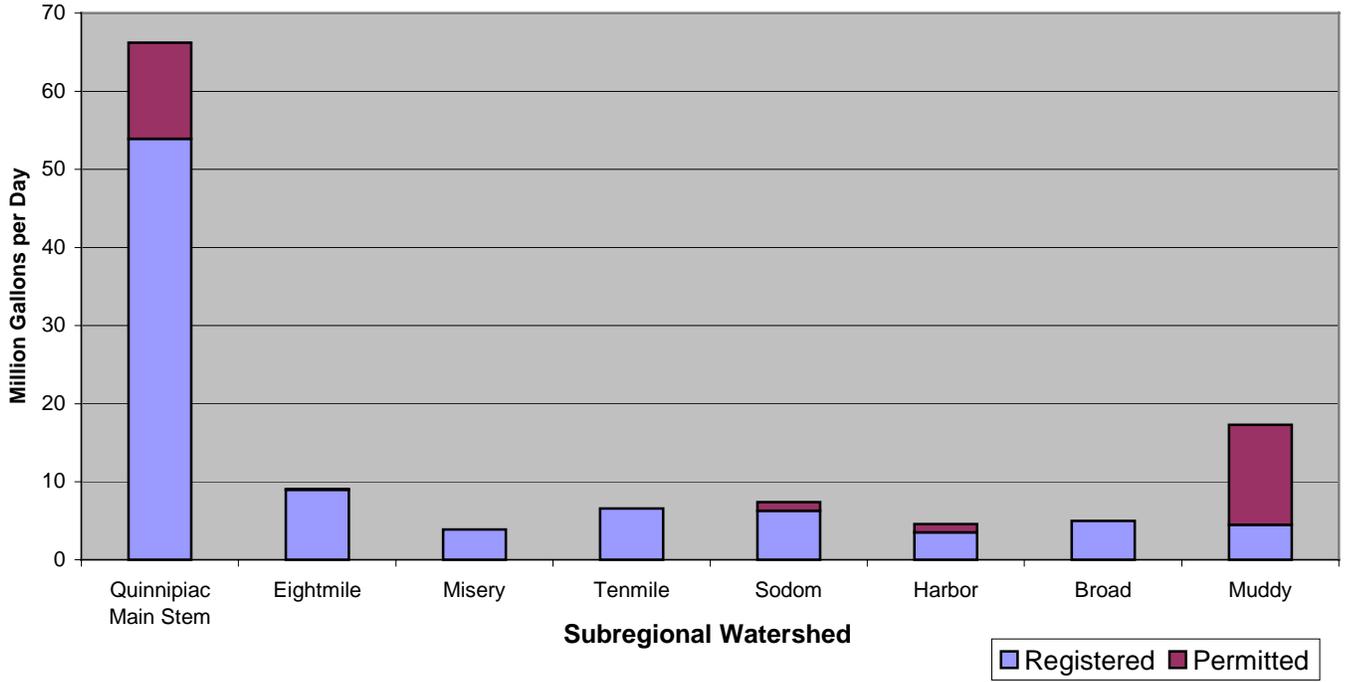
Under the Diversion Act, 1842 diversions were registered with the Department. Compared to **354** existing diversion permits, this means that over the vast majority of the water diverted in Connecticut is grandfathered and thus insulated from all regulation. Without the authority to place controls on the use and withdrawal of water taken pursuant to registered diversions, the State cannot implement a water allocation system. In addition, while the Department may be able to limit adverse impacts caused by permitted diversions, it is unable to do anything about the degradation of Connecticut's waters caused by registered diversions. There are currently many registered diversions that cause adverse environmental impacts, including impacts on aquatic life, waste assimilation, recreational activities, and other serious problems. The Department does not have the authority to prevent or stop a registered diverter from impacting or completely drying up a river, nor require registered diverters to avoid wasting water by metering, leak detection and repair, or other basic conservation measures. The Department also does not have the authorization to retire unused or defunct registrations, thus complicating the process of issuing new diversion permits.



Bride Brook, East Lyme, CT, August, 1999. Historically, Bride Brook provided an important route for one of the largest migration runs in coastal streams of the alewife, a type of herring that are a significant forage fish for larger fish species and birds. However, registered ground water diversions from nearby public water supply wells contribute to dry stream conditions in the brook just downstream of Bride Lake, significantly decreasing the viability of this alewife breeding ground.

A study of the Quinnipiac River watershed found that registered withdrawals account for the majority of the water diverted in the Quinnipiac watershed: 87% of the diversion sites and 77% of the diversion volume (Figure 2, next page) is authorized by diversion registrations rather than by diversion permits.

Figure 2. Capacity of Diversions
Quinnipiac River Watershed



The water available for new diversions in a basin is limited by the amounts claimed by registered diversions. The Diversion Act allowed registrants to register the maximum withdrawal capacity of their diversion facility or system based on historic use records prior to July 1, 1982. Registrants are not required, however, to report on the amount of water that they actually use or plan to use. The Department thus may not have an accurate picture of how much water is available in a particular basin for allocation through the permitting process. In fact, the sum of the amounts of water that the registered diverters can legally take from a source is often more than the amount of water available in that source.

In short, through the permitting process, the Department is only nibbling at the edges of environmental impacts of water diversions. Without the authority to place controls on the use and withdrawal of water taken pursuant to registered diversions, the State cannot implement a comprehensive water allocation system.

C. Inadequate Diversion Program Staffing

The diversion program has been hobbled for many years by inadequate funding for staff. Since 1986, the program has had no more than the equivalent of two full-time employees. This level of staffing severely limits the Department's ability to process applications, to provide much-needed pre-application assistance to regulated entities, and to engage in water planning. Unless staff resources are significantly augmented, permit applications will not be processed any quicker, the regulated community will continue to be frustrated with the program, and the goals of proper water management and long-term planning will not be met.

D. Permitting Conflicts With Federal Agencies

In certain instances, the Department has worked closely with water companies to explore the potential to expand existing surface water reservoirs to meet future demands for potable water. This has been done to specifically avoid the development of new groundwater supplies, which would result in the diminution of surface water flows as a result of groundwater pumping. Optimization of existing surface water reservoirs may have other potential environmental

benefits including the isolation of water resource impacts to areas and resources where historically impacts have occurred as a result of the construction and operation of the original projects. Reservoir expansion projects may provide the ability for water companies to enhance downstream flow releases if that capacity is planned and built from the outset of the project. Such projects can also avoid the impacts of building new civil works and conveyance systems to service the new groundwater withdrawals, and can use existing infrastructure to distribute water to the service areas. While optimization in certain cases may also cause negative environmental impacts, only those projects where the overall impacts associated with optimization are judged to be positive are the subject of this discussion. Unfortunately, federal agencies whose permit authorities focus principally on direct wetland and watercourse impacts associated with the construction of a project do not have the authority to fully evaluate secondary impacts related to stream flow issues and the proliferation of water supply wells dispersed widely across Connecticut's landscape. Therefore, these federal agencies have far less regulatory concern with the effect of new groundwater withdrawals upon streamflow or related environmental impacts associated with new well construction or with the construction of new conveyance systems to service those wells. Federal agencies have effectively blocked reservoir expansions because of direct impacts to riparian wetlands and have largely ignored the broader environmental benefit derived from limiting the proliferation of new water supply wells.

Federal agencies are constrained by their specific permitting authorities and tend to look narrowly at the immediate impacts of a project rather than a more global perspective to view the entire spectrum of environmental benefits and impacts. Connecticut would benefit from an expedited system designed to address water supply conflicts with federal permitting agencies.

V. TOWARDS A METHOD OF ALLOCATING WATER

A comprehensive water allocation system requires two things: (1) adequate scientific data to support a water allocation policy; and (2) adequate statutory authority to develop and implement such a system.

The Department proposes to develop and implement a comprehensive water allocation system as described below and in accordance with the proposed task force scope of work discussed later in this report. These efforts will enable the Department to develop a comprehensive water allocation system through development of a system for prioritizing water use requests, a means to designate an allocation, or set-aside, for the environment, and an efficient integrated water supply planning process. This proposal does not represent a completed proposal, but is rather a description of the issues and the direction the Department would work towards through discussions with stakeholders.

A. Continuing Development of Scientific Data

One of the major problems with the diversion permitting program is that essential scientific information necessary to engage in meaningful water use management and planning, as well as to make decisions on specific permits, is often incomplete. The information needed



Farm River, East Haven, CT, August, 1999. Poorly constructed gaging station at a registered diversion. The staff gage is high and dry even though there is water in the channel, and the staff is leaning over, making any data collected from this gage inaccurate.

includes applied research on watershed hydrology (i.e., the relationships among rainfall, storm water runoff, and ground and surface water flow), development of water use inventories, environmental monitoring, assessment of water resources, and identification of the causes of water resource degradation. Only with such information will the Department be able to understand the amount of flow necessary to maintain healthy aquatic communities in particular streams, as well as the amount of flow that should be reserved for future consumptive use.

It is important to point out such state-sponsored data collection efforts would benefit not only the state agencies involved in the planning process, but permit applicants as well. Permit applicants would have less data to collect to support their individual applications, saving time and expenses. Data availability will also significantly accelerate the Department's decision-making process on permit applications.

B. Development of an Allocation System

Water allocation is not merely a matter of dividing up the available water. The quantity of water available for consumptive diversions is unpredictable at any given time as stream flow varies daily, monthly, and seasonally. The challenge is to find an allocation method that can balance the needs of the competing users of water while also protecting the environment.

The Department recommends as the best means of achieving those goals the allocation of water through "apportionment." Under this approach, available water is apportioned among competing uses, both consumptive and non-consumptive. The apportionment method takes into account stream flow standards and thus assures sufficient stream flow to support aquatic life and to satisfy community waste assimilation and recreational needs. Under this method, the Department would apportion available water in advance of any diversion permit, and then give the applicant some percentage of the amount apportioned for the applicant's type of use.

A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it...The different traditions and practices in different parts of the country may lead to varying results, but the effort always is to secure an equitable apportionment without quibbling over formulas.



Shepaug Dam on the Shepaug River, Warren / Litchfield border, CT. Impoundments and dam structures such as this can be used to make releases to maintain streamflow during low flow periods.

Allocation by apportionment can be more readily accomplished in regulated watersheds, because such watersheds have water stored in upstream impoundments. This storage is essential for providing water releases to maintain instream flows during periods of low flow. Unless water stored upstream can be released during such periods, consumptive water use will exacerbate naturally occurring low flows in the stream.

A good example of the value of upstream water storage is the Farmington River Watershed. There, the large storage capacity of the Metropolitan District Commission (“MDC”) reservoirs and the United States Army Corps of Engineers’ multi-use reservoir in the upper watershed allow MDC to satisfy its customers’ drinking water needs while maintaining adequate flow along the main stem of the Farmington River.

In unregulated watersheds, stream flow naturally varies through the year, with highest flows in late winter and spring and lowest flows in the summer and early fall. In these waters, it is very difficult to augment natural stream flow. In unregulated watersheds, a water allocation

method that apportions flow is impossible to implement consistently without a management method that requires reduction of consumptive uses during low flow periods. During low flow periods the natural flow in the streams often falls to a level below that necessary to accommodate instream uses. As a result, streams may dry up during such periods as water is taken out to meet consumptive needs. The consumptive uses of the water are thus provided at the expense of instream requirements and a healthy aquatic community.

C. Allocation Priorities

An allocation method that allocates water by apportionment must include a means to prioritize the types of diversions that are permitted. For example, the diversion of water for a public water supply well may be a higher priority than a diversion for landscaping. Such a prioritization method must consider present as well as *future* water needs. The Department proposes to develop such a prioritization method in conjunction with other interest groups and stakeholders as a component of managing water use and the future allocation of water.

D. Development of An Allocation for the Environment

Another step in developing a water allocation methodology is to preserve the necessary amounts of water to safeguard the environment. Without set asides for the environment, streams, rivers, lakes, and other water bodies may suffer impairment and degradation during sustained periods of low flow. There may not be enough water to support fisheries and the aquatic life on which they depend, wildlife, and all of the other aspects of the natural environment which are water-dependent, as well as the recreational resources and natural beauty that make Connecticut so attractive to its residents and visitors. With careful planning, however, Connecticut can meet the needs of its citizens without sacrificing the quality of its natural environment.

The fish communities in streams subject to water diversions were found to vary in response to available flow. Trout and other intolerant stream dwelling fish prevail in Misery Brook, the Muddy River, Patton Brook and Sodom Brook only during years of ample precipitation. During years with average or below average precipitation, a shift in the species composition is observed with more stress-tolerant species being found in greatest abundance.

-- Findings of Quinnipiac River Study, Appendix D.

The Department believes that the best method for determining how much water is necessary to preserve the health of a particular water body is through the development of instream flow standards for Connecticut water bodies. An instream flow standard will identify the quantities of water that are needed to maintain aquatic resources at a given location along a stream segment throughout the year. An instream flow standard does not maximize the protection or preservation of aquatic resources, but rather will quantify the flow volumes necessary for sustaining aquatic resources. The Department therefore recommends that instream flow standards be developed as part of an allocation methodology.

The application of an instream flow standard specific to Connecticut watersheds when used in conjunction with water quality standards will establish a goal or target for water quantities essential to maintain stream functions, including the assimilation of wastewater discharges and aquatic health and fisheries functions. Instream flow standards would be subject to modification based upon more detailed watersheds flow studies either performed by diversion permit applicants or by the Department, subject to available funding. Strict adherence to such standards is not anticipated, but rather the standards would be viewed as a target or goal for water management decision making. Similar to the water quality standards, it is envisioned that instream flow standards would be achieved over a period of time as unused registrations are retired; unauthorized diversions are discontinued or restricted as the result of enforcement; or water resource management activities occur. Water resource management and implementation of resource plans may include such activities as removal of fish passage obstructions, cooperative flow studies with watershed water users, reaching agreement on flow releases from upstream impoundments through the hydropower license renewal process, or flood control management planning. Within a given watershed or stream reach, the extent to which priority water uses occur or alternatives exist will also influence the difficulty and timeframe necessary for achievement of water quantity goals. In watersheds which meet their specific instream flow standard, the Department would issue permits which would effectively “reserve” a water allocation for priority water uses such as drinking water.

In many watersheds without upstream storage impoundments, and along smaller rivers with substantial ground water withdrawals that affect stream flow, additional allocations may not be possible during the natural yearly low flow period. Along these smaller tributary streams,

withdrawals during higher flow periods could potentially occur in an unrestricted manner. As discussed earlier however, this may be problematic for some water users because consumptive use demands are typically either steady year-round or highest during the annual low flow period.

In order to implement instream flow standards, stream flow would have to be continuously measured at a number of locations within the watershed or along designated streams with similar hydrogeological characteristics and, when flow reached specified levels below which adverse environmental effects would occur, withdrawals for consumptive uses would have to be progressively restricted or, if necessary, suspended. A commitment to funding stream gaging (*such as the US Geological Survey gage shown at right*) is essential, and requires a reversal of current trends. Connecticut has lost funding for 50 gaging stations in recent years and may be losing another ten this year.



The Department therefore recommends the development of watershed-specific allocations that will provide for seasonally-variable environmental needs. The following allocation method is recommended as the most *practicable* approach:

- (1) Develop a *Connecticut Aquatic Base Flow Methodology* based on watershed-specific interdisciplinary studies of instream flow needs. Use the protocols outlined in the publications, *August Median Streamflows in Massachusetts*, U.S. Geological Survey, Water-Resources Investigations Report 97-4190, and *The Instream Flow Incremental Methodology – A Primer for IFIM*, internal publication of United States National Biological Survey, Fort Collins, Colorado, in developing such a methodology. The objective would be to develop a series or matrix of watershed characteristics and flow studies from which to establish seasonally varying instream flow standards specific to Connecticut’s geomorphology and climate. Seasonally varied flow standards would be established.

- (2) Until the Department has developed a *Connecticut Aquatic Base Flow Methodology*, the Department recommends application of the *New England Aquatic Base Flow Policy* (NEABF). The NEABF policy, developed by the U.S. Fish and Wildlife Service (1981), specifies instream flow needs for summer, fall/winter, and spring periods, thus it is reflective of the natural hydrograph in providing for seasonally variable instream flows.
- (3) Upon development of a *Connecticut Aquatic Base Flow Methodology*, water can be apportioned for further consumptive uses after the instream flow allocation has first been reserved for the environment.
- (4) The Department would also develop criteria to allow for additional diversions to meet priority water needs during emergency periods such as critical water shortages caused by drought conditions provided, conservation was implemented first.
- (5) For watersheds which do not currently meet the instream flow standard as established by the proposed *Connecticut Aquatic Base Flow Methodology*, the instream standard would serve as a water resource management goal or target and be subject to further refinement subsequent to an Instream Flow Incremental Flow study of uses and priorities within the watershed.

When combined with an inventory of registered and permitted diversions, this approach to water allocation would lead to more predictable decisions for persons contemplating proposed consumptive use diversions.

E. Encouraging Development of Alternative Water Supplies and Supply Sharing

The Department proposes to adopt policies that encourage the development of Class B⁷ waters sources for non-potable drinking uses. Connecticut allows only the use of Class A water for drinking and other domestic uses and the Department recommends

"Although the total statewide yield of existing water supply facilities is adequate to meet existing and much of the future demand, the supplies are not evenly distributed throughout the state. Thus, new sources and interconnections will be needed to meet local supply deficiencies."

State of Connecticut Plan of Conservation and Development, page 55.

⁷Class B means fishable, swimmable, but not drinkable.

that the current public water supply standard, which prohibits wastewater discharges to drinking water supply resources, be maintained. However, there are many Class B waters such as the Connecticut River, the Thames River, and the Housatonic River which could provide additional supply for industrial use, power plant cooling water and irrigation. By encouraging the development of such resources for non-drinking water purposes, the state could stop or prevent the use of millions of gallons of Class A water per day for non-potable needs.

As Connecticut's population spreads outward to the suburbs and more rural areas, there is an increasing need for public water supply in areas traditionally served by private residential wells. In many urban areas water demand has decreased, often as the result of the shift from manufacturing and intensive water use industries to high-tech, low water use industries. As a result, public water suppliers may have water reserves which could meet some of the increased suburban and rural need, although the suppliers are often reluctant to share that water with neighboring towns.

Connecticut's largest cities – including Stamford, Bridgeport, Waterbury, Hartford, Meriden, Wallingford, New Britain, New London, Groton, and Danbury—historically developed large drinking water reservoirs. The water is aggressively protected from pollution sources, and can be delivered through gravity-fed pipes. Effective sharing of these large centralized water supply systems could minimize additional costly infrastructure investment and avoid environmental impacts associated with development of new water supply sources. Such supply sharing must be carefully considered. The State should avoid costly water main extensions to serve areas more effectively served by private wells or by a new diversion which may pose little environmental impact. An example is the recent agreement between the Metropolitan Water Commission of Hartford to supply water via an interconnection to the Town of Portland. The amount desired by Portland was a small amount of MDC's total supply but resulted in the avoidance of capital investments by Portland to build a water filtration plant and possible impacts to vernal pools and wetlands associated with development of wells. Interconnections between water utilities and regional water planning needs to be encouraged to promote efficiencies, prevent drinking water emergencies, and to discourage inappropriate scattered development, specifically not recommending the expansion of water systems into rural/suburban area.

VI. RECOMMENDATIONS

A. Administrative Recommendations

The Department recommends consideration of the following administrative measures for further study.

(1) Coordination Of Authorities

The Department recommends the consolidation and integration of Connecticut's existing agency-based water resource planning programs under one comprehensive water resource planning process to be carried out or coordinated by a single agency.

As presented in this report, various elements, policies and authorities for water resource planning currently exist within the authorities of Connecticut's Executive Branch Agencies. These programs are often not coordinated effectively between the agencies and the public, nor does any one agency planning effort evaluate the needs of constituencies outside of that agency's traditional client base. Connecticut would benefit from a comprehensive, integrated water-planning program to fully evaluate the water resource needs and challenges for the state. In addition to involving traditional agency-specific interest groups who are typically engaged in the ongoing planning efforts by specific executive branch agencies, new interest groups should be included in the planning process. These interest groups include agricultural entities, recreation interest groups, power producers, industrial users, irrigators and municipalities. Development of a comprehensive water management plan for Connecticut would be strengthened with input from these groups who do not have a forum to present their water resource interests or needs. This comprehensive planning effort is not proposed to replace existing agency-specific planning efforts rather this process would integrate those ongoing efforts and adjust priorities where needed to enhance the state-wide plan. This effort would be an expansion of §22a-352 of the CGS which tasks OPM, DEP, and DPH to undertake a statewide plan to evaluate waste water assimilation and potable water needs for the state.

(2) Adoption of additional necessary authorities

The Department further recommends development of additional authorities to implement Connecticut's comprehensive water resource plan following its adoption.

Once a statewide water resource plan is adopted, its recommendations will need to be implemented for the plan to be successful. Recommendations are likely to include strategies to: enhance existing data acquisition efforts and initiate new efforts to gather additional water resource information; develop programs and authorities to foster statewide water resource planning efforts; encourage better coordination between executive branch agencies; and promote the involvement of new water resource interest groups and their priorities within the statewide planning process. In addition to statutory authorities and state agency actions to support the plan, resources will be needed to support its implementation. Budget allocations for the coordinating agency will be necessary to support the plan's development and the implementation of its recommendations.

B. Task Force Initiatives

The Department of Environmental Protection recommends the development of a task force to evaluate and provide recommendations, including legislative revisions, to address the following proposed revisions to the Water Diversion Policy Act:

(1) Modifying Registration Program

Renewal Process

Under the Act there is no procedure to review, modify, or retire unused or inactive registrations filed in 1983. This means that the Department often does not learn that a registrant is no longer using the amount of water that he has registered, and that that amount of water is available for other uses. The Department recommends that registrants be required to renew their registrations every five years. Renewal filings would be required to document the current and

future need for the water diversion. A procedure would be established to retire diversions for which the need no longer exists, through a public notice and opportunity for a hearing.

In addition there is no requirement under the Act for registrants to notify DEP of address changes or contact names changes. As a result the registration inventory contains mostly 1983 information, which is virtually unusable to contact registrants or perform a mailing. This directly hampered investigation of current or planned use of registered water. Therefore, the Department also recommends that the renewal filing be used to update basic registrant information.

Failure to renew or update contact information would result in discontinuation of the registration. Subsequent to the renewal filing, DEP would periodically publish a report of valid, active registrations.

Establishment of authority to assess the environmental effects of registered diversions and to order mitigation measures:

The Department recommends statutory language to authorize periodic review and investigation of registered diversions in order to assess their environmental effects and to further authorize the Department to issue an order to a registrant whose diversion is causing substantial and avoidable damage to water resources requiring mitigation measures including but not limited to reducing the amount, rate or frequency of an withdrawal balanced with public health considerations and the extent to which the diversion is necessary and is a priority use.

End the registration petition process created by Department regulation:

In order to make future allocation decisions, the department must be able to maintain a static baseline of water allocated through the registration process. The existing petition process allows a registrant to request amendments to its registration at any time and for any reason. After review of the diversion inventory contained within this report, the Department recommends that the registration petition process be closed.

(2) Address Unauthorized Water Diversions/Permit Compliance

Improper or illegal water diversion can adversely affect the environment and restrict legitimate users from further diversion opportunities. The Department is also requesting funding

for enhanced staff to track compliance with permit conditions and investigate unauthorized water withdrawals.

Amnesty for certain unregistered, unpermitted diversions:

The Department proposes the creation of a limited amnesty for certain classes of water users, including community water supplies and family farmers, who failed to properly register existing water use in 1983. This will encourage currently unauthorized water users who might fear penalties for past water use to come into compliance with diversion requirements. The amnesty would forego penalties for past use provided that within the amnesty window the unregistered / unpermitted diverters do one of the following: apply for a diversion permit; discontinue water withdrawals; or restrict water withdrawals to below the diversion act threshold of 50,000 gallons per day.

Compliance Monitoring

New staff would also be dedicated to review: water use records for consistency with permit restrictions and for exceedence of the diversion regulatory threshold; available databases and watershed information to investigate unauthorized water diversions.

Strengthen enforcement tools

Currently it is difficult to document that diversions located in the field or subsequent to a complaint investigation may be subject to a diversion permit or in violation. Effective enforcement requires additional tools. The Department recommends statutory authority be established allowing the department to request that information be furnished relating to suspected violations of the Water Diversion Policy Act, including installation and maintenance of equipment to record water withdrawals.

(3) Establishment of authority to promote interconnections, and water supply sharing

The Department recommends revisions to C.G.S. §22a-373(d) to provide that permit applicants seeking to develop a new water supply source shall, whenever feasible and prudent, avoid new source development if interconnection and supply sharing can be achieved consistent with instream flow preservation.

(4) Establishment of authority to set priorities for water allocation

The Department proposes to develop prioritization criteria as a component of managing water use and the future development of consumptive diversions. This will direct the department and applicants regarding state allocation priorities when there are competing uses or applications for water allocations.

(5) Basin-wide studies

The Department proposes statutory authorization to perform basin-wide studies of water use, including permitted, registered, and unauthorized diversions. This will assist the Department in addressing watershed flow and allocation issues and will assist both the Department and local governments in determining how much water in a watershed remains for new diversions and would be the baseline for setting priorities.

(6) Establishment of a process for watershed closure

The Department recommends that the Diversion Act be amended to allow the establishment of a procedure (to include an administrative hearing) for closing a watershed to additional consumptive withdrawals, based upon the results of a comprehensive basin study. This will protect over-allocated watersheds from further pressures by directing diversion applicants to other areas and avoid unnecessary expense and delays by applicants.

(7) Streamline general permits

The Department requests statutory revisions which would modify the general permit authorization to increase flexibility and create a three-tiered approach similar to the general permit statutes administered by other programs. The proposed general permit categories are: 1) automatic coverage; 2) notification filing; and 3) approval required. Additional categories of coverage are also anticipated to be incorporated as general permits are renewed.

(8) Fees

Registration renewal and transfer fees are proposed to support program functions and partially fund the hiring of additional staff to review applications in an expeditious manner.

Registration Renewal Fee

A registration renewal fee, similar to permit renewal fees, is proposed. The renewal fee

would be due every five years and would be consistent with the existing fee structure for permit applications and permit renewal, and would be deposited into the Environmental Quality Fee Fund.

Registration and Permit Transfer Fee

The Department also proposes to establish fees for processing transfer of registrations and permits.

C. Other Recommendations

(1) Water Conservation

The Department recommends development of a comprehensive water conservation policy that would require (1) cost-effective water conservation measures be implemented prior to requesting a new source; and (2) conservation practices to be implemented by all diverters. The Department proposes to establish core water conservation measures which must be implemented prior to requesting an additional allocation of water and to modify the diversion regulations to require compliance with these core measures as a prerequisite to a diversion permit application.

(2) Instream flow standards

The Department requests funding for hiring recognized experts in hydrology and aquatic habitat to assist the Department in developing an instream flow methodology specific to Connecticut basins and streams as previously described. The department will then apply the methodology on a watershed by watershed approach applied to each of the five major basins in Connecticut. A watershed atlas would subsequently be published to assist potential diversion applicants and resource managers on instream flow targets.

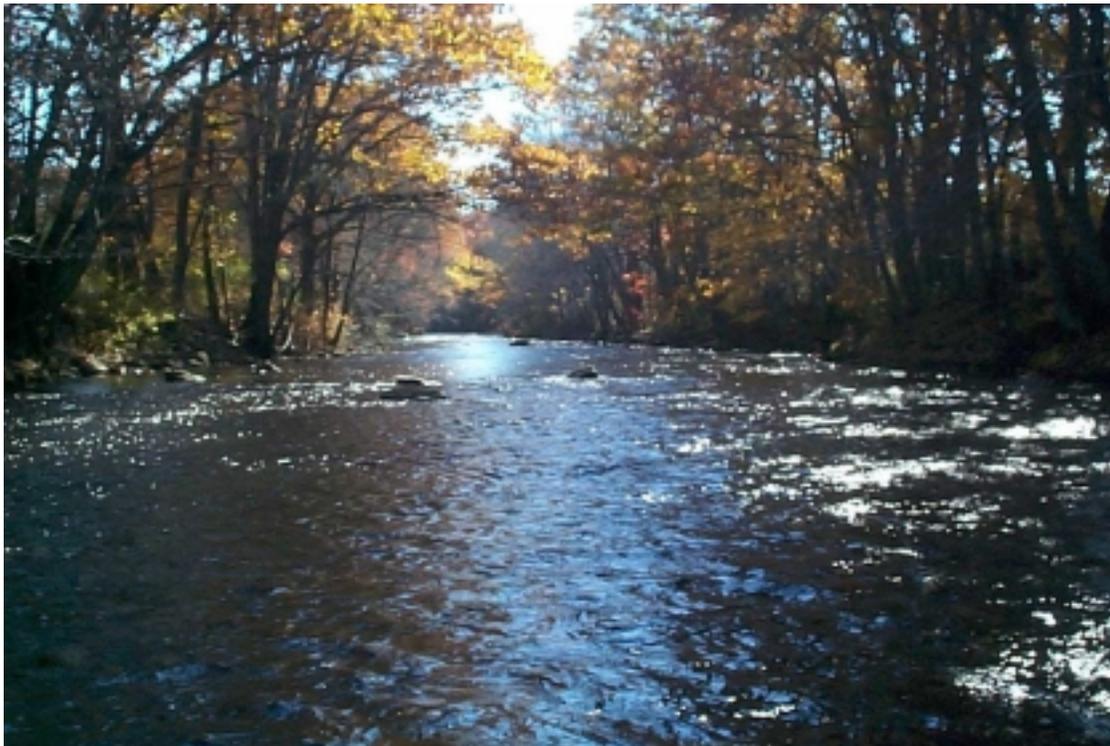
(3) Water Supply Sharing and Development of Alternative Supplies

The Department proposes to work together with applicants, the Department of Public Health, the Office of Policy and Management and the Department of Public Utility Control to avoid environmental effects of new source development by promoting interconnections, water supply sharing, and reservoir expansion. In addition, the Department recommends that development of Class B water resources for non-potable purposes such as industrial supply

substitution, cooling water, process water, irrigation etc. be encouraged and promoted wherever feasible and prudent.

(4) Staffing and Other Program Enhancements

The Department requests sufficient staffing to review registrations, perform basin studies, monitor stream flows, perform fisheries surveys, provide technical assistance and respond more promptly to permit applications in order to effectively manage the diversion permit program. In addition, the Department seeks additional funds in its budget line-item associated with the Department's cooperative program with the United States Geological Survey for continuous monitoring of stream flow and water quality.



Moosup River, Plainfield, CT

VII. CONCLUSION

The time has come for Connecticut to lead the nation in the development of a comprehensive and sustainable water allocation policy. The ideas and proposals set forth by the Department in this report, if implemented, will create a progressive water regulatory framework that will provide predictability to the regulated community and will help assure that all of Connecticut's citizens have a reliable source of water, live in a healthy environment, and experience the natural beauty of the state.

Some of the changes contained in this report will not be easy to implement, because they represent a major change in the way we think about water. Some of the changes also emphasize the future needs of the state, and therefore require what may initially be experienced as sacrifice. However, a decision on the direction of water regulation cannot be put off any longer. The conflict between competing water uses is mounting. With each passing year, opportunities to make positive changes with respect to our water resources are lost.

Shifts in population and industrial growth are exerting increasing pressure on Connecticut's water resources. The state needs to take action now to protect this public resource, in keeping with the responsibilities with which we are charged for managing public resources. The changes we make now will be appreciated for generations to come.

Appendices

- A. Public Act 98-224
- B. Diversion Registration Inventory
- C. Diversion Permit Inventory
- D. Quinnipiac River Watershed Case Study
- E. Scantic River Basin Registration Update
- F. Proposed Establishment of Water Policy Task Force
- G. List of Water Policy Authorities