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WATER CONSERVATION AND EFFICIENCY IN PENNSYLVANIA

Introduction -Statewide Priorities

Since 2004, the Department, along with the statewide committee and the six regional committees that have participated in the state water planning process, evaluated various water resource issues to form principle priorities as the foundation of the State Water Plan. Promoting water conservation technologies emerged as one of the three principle priorities.

Businesses that can develop technology to conserve water and use water more efficiently, restore water quality, and/or reduce water withdrawals and water quality impacts of any activity will improve health and enrich lives while reaping significant economic rewards. Pennsylvania should promote leadership and business development in innovative water resource conservation, water use efficiency, water quality protection and enhancement technologies.

Water Conservation and Water Efficiency

Although the terms water conservation and water efficiency are commonly used interchangeably, there is a difference in their meaning. "Water conservation" refers broadly to a beneficial reduction in water use or water losses to wisely manage, preserve or save water. Water efficiency concepts are often part of water conservation initiatives. "Water efficiency" specifically refers to achieving the same result or accomplishing a function, task or process using less water or a minimal amount of water.

Water efficient practices, products or systems use less water than traditional products or systems without sacrificing performance. Examples include use of low-flow plumbing fixtures such as toilets and shower heads, drip irrigation systems and water reuse of gray water and capture/use of rainwater for nonpotable uses.

Water conservation, as it pertains to reduction in demand for public water, is often implemented at a local level through programs that include but are not limited to public education, varied water rate structures, water restrictions or prohibitions on non-essential water uses during droughts and incentives for plumbing retrofits.

Overview of Existing Programs

Water Resources Planning Act —Proposed DEP Regulations at Chapter 110 and Water Conservation

Section 3118 of The Water Resources Planning Act established an interim registration program and directed the Environmental Quality Board to "adopt regulations establishing requirements for the registration, periodic reporting and recordkeeping of withdrawals." The

Environmental Quality Board has proposed regulations at 25 Pa. Code Chapter 110 that fulfill the requirements of 3112(a)(11) which requires the State Water Plan to include a process for identifying projects and practices that are being or have been implemented by water users that reduce the amount of water withdrawal or consumptive use, improve efficiency in water use, provide for reuse and recycling of water, increase the supply or storage of water and preserve or increase groundwater recharge. Sections 110.601-603 of the proposed DEP regulations establish a voluntary system for registration of water conservation projects or practices.

Section 110.603 of the proposed regulations requires periodic reporting by registrants to document the continuing effectiveness of the registered project or practice.

The Department will develop a process as described under Section 3112(a)(11) to provide the appropriate positive recognition of projects or practices documented through the above registration process subsequent to research in areas linking land management practices, water conservation and groundwater recharge.

The Water Rights Act

In accordance with Act 365 of June 24, 1939, known as the Water Rights Act, the Department administers the Surface Water Allocation Program. Under this program, the Department approves the acquisition of surface water rights by public water supply agencies. These approvals, commonly referred to as water allocation permits, enable public water supply agencies to legally acquire rights in surface waters, "by purchase, lease… eminent domain…or otherwise." Water allocation permits typically include a range of conditions that the public water supply agency must comply with, including conditions relating to water conservation. The water conservation conditions may, in addition to other requirements, require the public water supply agency to:

(1) Develop a drought contingency plan describing the measures that will be taken to conserve available supplies and reduce water use during an emergency, such as a drought or industrial waste spill, that may render sources inadequate or unavailable for a period of time
(2) Adopt and implement a water conservation program, including but not limited to:

    (i) Installation of customer meters
    (ii) An ongoing meter testing, repair and replacement program
    (iii) An ongoing leakage/loss control program
    (iv) A water conservation education program
    (v) A program to require installation of water-saving plumbing devices in all new accounts or promoting the adoption of water conservation ordinances
    (vi) A requirement to comply with the water conservation policies of the Compact Basin Commission, if applicable

(3) Submit an annual permit compliance report, which includes a description of the water conservation program and its implementation
(4) Reduce, if necessary, and maintain its unaccounted-for water loss to a level of 20 percent or less
(5) Accurately measure, record and report to the Department its withdrawals from each source of supply

Emergency Management Services Code—Drought Emergency Regulations

Drought Monitoring and Management

Pennsylvania has one of the most sophisticated drought monitoring networks in the nation. It continuously tracks precipitation, stream flow, ground water levels, soil moisture and reservoir levels, providing real-time data and instantaneous analysis of these important drought indicators. DEP, PEMA and the basin commissions rely on these drought indicators to constantly measure overall water supply conditions. Indicator assessment results are used to determine whether a water supply drought is developing and to approximate its significance.

A "Drought Watch" is the least serious of the three phases of drought management. A drought watch can be issued by the DEP Secretary upon consultation with the Drought Task Force and the Governor's Office. A drought watch is issued at the onset of drought conditions. It prompts a request for individuals to voluntarily reduce water use by about 5%, and initiates notification of public water suppliers to update and begin following their drought contingency plans. A "Drought Warning" is issued by the DEP Secretary when conditions deteriorate to the point that an emergency is imminent. News releases are made in the affected areas, public water suppliers are notified of the change in drought status, and individuals are asked to reduce water use by 10-15%.

Under the Emergency Management Services Code, the Governor has sole authority to declare a natural resource shortage in Pennsylvania. Such a declaration is justified when a threat or actual occurrence of a local emergency is judged to be of sufficient severity and magnitude to warrant local action to prevent or alleviate damage, loss, hardship or suffering. It follows that a "Drought Emergency" may be declared only by proclamation of the Governor. Upon the Drought Task Force recommending an emergency declaration, the Pennsylvania Emergency Management Council, chaired by the Lieutenant Governor, convenes to advise the Governor whether a drought emergency should be declared in any part of the Commonwealth. Issuance of a drought emergency proclamation by the Governor activates PEMA's emergency management regulations at 4 Pa. Code Chapters 118, 119, and 120.

Chapter 118 requires each public water supplier in the affected area to ensure that DEP has a copy of its current drought contingency plan which must include among other items, a plan of actions which will be taken by the public water supply agency to respond to drought or water shortage conditions, and a water conservation program. Industrial and commercial water users may also be required to submit and follow drought contingency plans if conditions become extreme. Those plans must include descriptions of measures previously undertaken to conserve water at the facility, potential measures which could be implemented to reduce water use under emergency conditions and plans of actions to achieve a phased reduction of total withdrawal and use amounts of 5%, 15%, 25%, 35% and 50% should such reductions be ordered by the Governor or the Commonwealth Drought Coordinator.

Drought management requirements most visible to the public are the nonessential water use restrictions listed in Chapter 119. These restrictions are designed to achieve an overall water use reduction of up to 25%. Nonessential water use restrictions generally apply to outdoor usage such as irrigating lawns and shrubs, washing vehicles and paved surfaces, filling

swimming pools, and using water for ornamental purposes. The nonessential water use rules also describe a process for requesting exemptions and variances. Under provisions of Chapter 120, each public water supply agency and each municipality must monitor its water supply levels, estimate the availability of its sources, and implement water conservation measures to extend supplies. If demands exceed or threaten to exceed supplies, a public water supplier or municipality may request the Commonwealth Drought Coordinator to approve water rationing within its service area. This step should be taken only when sources are so depleted that public health and safety are threatened. Under rationing, each customer is allotted a specific quantity of water that can be used. Exceeding the allotment results in steep excess use charges and could lead to water service being physically restricted, interrupted or terminated. The Commonwealth Drought Coordinator ensures that rationing is justified before approving individual requests.

River Basin Commissions

Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) is an interstate compact commission with regulatory authority over the entire Delaware River Basin, including those portions of the basin in Pennsylvania. The DRBC has promulgated regulations addressing water conservation through a series of resolutions over the past three decades.

Under the first resolution, adopted in 1976, the DRBC undertook a "long-range continuing program to reduce water use" and established a policy to "require maximum feasible efficiency in the use of water" by industrial, municipal and agricultural users throughout the basin. Under that and successive resolutions amending the Basin Water Code, the DRBC:

(1) Required inclusion of a water conservation plan in applications by owners of water supply systems for new or expanded water withdrawals;
(2) Undertook research and planning programs to foster water conservation;
(3) Embraced the objective of reducing consumptive use of fresh water;
(4) Established water conservation performance standards for plumbing fixtures and fittings and mandated compliance with those standards in all signatory state and political subdivision water conservation performance standards;
(5) Required owners of public water supply systems supplying in excess of 100,000 gallons of water per day (gpd) to undertake a systematic program to monitor and control leakage within their water supply systems;
(6) Promotes and supports retail water pricing, by public water suppliers, that encourages customer conservation, including a requirement for all suppliers withdrawing more than 1,000,000 gpd to include in applications for new or expanded withdrawals an evaluation of the feasibility of implementing a water conserving pricing structure and billing program;
(7) Required applicants for projects involving out-of-basin diversions to indicate the conservation measures that have been taken to forestall the need for a diversion of basin water;
(8) Required owners of public water supply systems that distribute in excess of 100,000 gpd to install customer water meters incident to the provision or maintenance of service at the retail level; and

(9) Required, with some exceptions, each project whose withdrawal exceeds 100,000 gpd to install source meters and to record and report their withdrawals to the DRBC or a designated state agency.

In 1983, the DRBC approved the "Good Faith Agreement", which established a drought management plan for the basin and incorporated it into the DRBC Water Code. That plan became the basis for Pennsylvania's drought management plan and the regulations described in section c, above. The DRBC relies upon its state members to implement drought emergency provisions of the basin plan on its behalf, and Pennsylvania implements those provisions through 4 Pa. Code Chapters 118-120 under the Pennsylvania Emergency Management Services Code.

Susquehanna River Basin Commission

Like the DRBC, the Susquehanna River Basin Commission (SRBC) is an interstate compact commission, whose regulatory authority extends throughout the Susquehanna River Basin, including those portions of the basin located in Pennsylvania. The SRBC's water conservation requirements are addressed in 18 CFR Section 806.25 of their regulations.

The SRBC regulations require public water suppliers to:

(1) Reduce distribution system losses to 20 percent or less
(2) Install meters for all users
(3) Establish a program of water conservation, including requirements for installation of water conservation devices; distribution of water conservation literature to customers; implementation of conservation water pricing structures; and encouraging water reuse.

Industrial water users are required to:

(1) Designate a company representative to manage plant water use
(2) Install meters or utilize acceptable flow measuring methods to accurately determine water use
(3) Install appropriate flow control devices
(4) Evaluate and utilize applicable recirculation and reuse practices

Irrigation water users are required to utilize irrigation systems properly designed for the respective soil characteristics, topography and vegetation.

<u>Public Utility Commission</u>

Public utilities are regulated under Title 52 (Public Utilities) of the Pennsylvania Code.

52 Pa. Code Chapter 65. Water Service, includes provisions on metering. Customer water metering provides an incentive for water conservation by allowing customers to view their water use, detect leaks and develop their own conservation plan. Under Section 65.7, a public utility after August 15, 1981 which is issued a certificate of public convenience permitting it to begin to render water service and a currently existing public utility which begins to render

water service to an additional, noncontiguous, service area shall be required to furnish metered service. Further Section 65.8 provides specific requirements for allowable meter error, testing and installation/removal of meters.

Section 65.11 provides for the imposition of mandatory conservation measures to reduce or eliminate nonessential uses of water by public utilities while Section 65.20 provides a statement of policy that during rate proceedings of water utilities, the PUC intends to examine specific factors regarding the action or failure to act to encourage cost-effective conservation by their customers. Utility efforts that are considered include education, water audits, efficiency plumbing fixtures, unaccounted for water, leak detection, metering and conservation plans.

Reuse of Treated Wastewater

In December 2005, the Department prepared a draft guidance manual for reuse of treated wastewater, describing activities that may only occur under the authority of a permit issued by the Department. The manual does not cover land application of wastewater for additional treatment purposes. It includes design, operation and maintenance requirements for wastewater systems discharging treated water for beneficial reuse. Promoting wastewater reuse and recycling conserves water usage and wastewater discharge.

Traditional wastewater treatment processes reduce the concentrations of wastewater pollutants to levels protective of receiving water since the potential for human contact, inhalation and/or ingestion is minimal. An additional level of public health protection is necessary to further reduce pathogenic organisms when considering water reuse. Advanced wastewater treatment processes are generally utilized for this purpose, particularly when high quality reclaimed water is necessary for public access areas.

One of the most critical objectives in a reuse program is assuring public health protection is not compromised. Other objectives, such as meeting user requirements, avoiding public nuisances and preventing environmental degradation, are also important considerations.

WaterSense Partnership and Water Efficiency

The Department is a governmental promotional partner for WaterSense®, a partnership program sponsored by the U.S. Environmental Protection Agency (EPA) whose mission is to protect the future of our nation's water supply by promoting and enhancing the market for water-efficient products, programs and practices. This "national brand" program, similar to the "Energy Star" program for energy efficiency, offers people a simple way to make product choices that use less water, with no sacrifice to quality or product performance.

As promotional partners, the Department has provided each of about 2,000 community water systems in Pennsylvania with information on the program to encourage their partnership with the EPA and to disseminate information to their customers on the WaterSense label and benefits. The Department also provides web links to the WaterSense website. Further information on WaterSense may be found at www.epa.gov/watersense.

Sustainable Infrastructure

There is a recognition that our nation's water and sewer infrastructure is in bad condition and getting worse. From this, the concept of "Sustainable Infrastructure" or "SI" has evolved to ensure long-term sustainability of water infrastructure and described by the EPA as four "pillars":

- Better Management
- Infrastructure Financing
- System Efficiency
- Watershed Approaches

Pennsylvania Governor Edward G. Rendell signed Executive Order 2008-02 (as amended on April 28, 2008) that calls for the establishment of a "Sustainable Water Infrastructure Task Force" (Task Force) whose purpose will be to provide, among other items, recommendations for legislative or regulatory changes to promote sustainable water and sewer services. A report coming from the Task Force scheduled for October 1, 2008, will include recommendations falling within the SI System Efficiency pillar:

"Efficient Operation" - incorporation of water and energy conservation and system optimization to deliver cost-effective treatments that meet or exceed existing and future public health and environmental standards.

"Maximization of Non-Structural Solutions" - integrating conservation, water reuse, trading strategies and comprehensive water resource planning into sewer and water infrastructure planning.

The Department will review the Task Force report and explore opportunities to interconnect programs to more effectively and thus effectively change the way it does business to promote SI concepts and water conservation.

Water Resources Technical Assistance Center

Water conservation will play an important role under System Efficiency through the establishment of a Water Resources Technical Assistance Center (TAC), as required by Section 3120(A) of The Water Resources Planning Act. The TAC role will be to promote voluntary water conservation and provide technical assistance on water resource issues, including practices and measures that reduce demand for water, improve water use efficiency, reduce water leakage and enhance groundwater recharge.

Recommendations:

A Water Conservation Subcommittee (Subcommittee) of the Statewide Water Resources Committee was formed in early 2007 to assist DEP in setting up the Water Resources Technical Assistance Center. The technical assistance center should satisfy the requirements set forth in Section 3120 of the Act.

The Susquehanna River Basin Commission (SRBC) received a Growing Greener grant from DEP to develop a plan of action for implementing the Center. To support and enhance SRBC's efforts, four specific tasks that it could undertake were identified as:

1. Produce a preliminary mission statement for the Center.

2. Determine where the Center will be housed.

3. Identify potential partners who would establish, maintain and operate the Center.

4. Outline initial start-up funding requirements for the Center and investigate potential funding sources.

A hybrid model for managing water conservation programs is recommended to best meet Pennsylvania's needs. After reviewing other similar state programs, the model used by Arizona seems to be a good fit for Pennsylvania. An academic institution or university should physically "house" and offer administrative support for the Center. Selection for this entity should be done through a request for proposal (RFP) process. Oversight and functional responsibility should rest with a "board" whose membership is comprised of representatives from the private sector, academia, and government (including DEP and state elected officials).

Once SRBC completes and presents its plan of action for the Center, it is recommended that DEP issue the RFP for maintaining and operating the Center. Throughout this process, the Statewide committee will work with DEP to initially establish the Center, including forming its governing "board."

A majority of the initial functions of the Center will be to achieve effective outreach and incentive building. An eventual expansion into research and development is another goal for the Center.

The Center will require a substantial, consistent and dependable funding source. The initial funding for the incubation period is estimated to be $250,000. A practical source of those funds is by appropriation through the Pennsylvania legislature. Future funding sources, in addition to legislative appropriations, are grants (i.e., Growing Greener, academic and industry grants). These funding sources can be leveraged to provide research and development funding by a factor of 2 – 3 times.

Additional recommendations and goals for improving water conservation and efficiency in Pennsylvania include:

- Conduct research and promote innovative practices through marketing incentives, outreach and educational efforts.
- Support innovation and implementation of technology and use policies that cut water resources use and demand at peak times of drought or resource constraint.
- Implementation of technology and use policies that result in a reduction in overall base demand.
- Provide support and resources to entities that have implemented or started to implement innovative water conservation or water efficient practices
- Greater use of local "Microgrids of water" (catchment and use of precipitation to supplement withdrawals from ground water or streams and rivers).
- Funding rebates or swaps of industrial high water using equipment (open loop systems) with closed looped systems or low water use residential appliances.

- Smart Meters - water use meters that allow better measurement of water use in buildings such that wasteful water leak detection and other wasteful water use is identified.
- Time of Use Rates – rates that encourage using water at times of less demand.

Water conservation and efficiency measures such as these and others will be fully explored as the aforementioned Water Resource Technical Assistance Center (TAC) is established and functioning.