

COMMITTEE ON SCIENCE AND TECHNOLOGY
Subcommittee on Energy and Environment
U.S. House of Representatives

Research to Improve Water-Use Efficiency and Conservation: Technologies and Practices

Tuesday, October 30, 2007
2:00 p.m. to 4:00 p.m.
2318 Rayburn House Office Building

Purpose

On Tuesday, October 30, 2007 the Subcommittee on Energy and Environment of the Committee on Science and Technology will hold a hearing to receive testimony on H.R. 3957, *The Water-Use Efficiency and Conservation Research Act of 2007*. The purpose of the hearing is to evaluate the need for research and development of technologies and processes to enhance water-use efficiency and water conservation. The Committee will also ascertain perspectives on current federal efforts to promote water-use efficiency and conservation through programs such as the WaterSense program of the Environmental Protection Agency (EPA).

Need for Legislation

The dwindling supply of water in the United States has created increasing concern at all levels of government. Since 1950, the United States population has increased nearly 90 percent. In that same period, public demand for water has increased 209 percent. Americans now use an average of 100 gallons of water per person each day. This increased demand has put additional stress on water supplies and distribution systems, threatening both human health and the environment.

Approximately 26 billion gallons of water are used every day in the United States and thirty six states are anticipating local, regional, or statewide water shortages by 2013. However, some states are already in the middle of a severe drought. Most of the Southeastern United States, stretching from Tennessee across the Carolinas and into Georgia, is suffering from an exceptional drought, the highest intensity as measured by the U.S. Drought Monitor. The city of Atlanta is bracing as experts argue whether the city water supply will last as few as three months or as many as nine months.

In California, catastrophic fires burned across areas of the southern part of the state this week. Extreme drought conditions over the past two years have played a large role in creating the conditions that made such a disaster possible. More than 500,000 people were evacuated from their homes at the height of the fires, the largest number in California history. Over 2,000 homes and at least 180 commercial buildings were destroyed or damaged. The drought gripping the West is considered by some experts to be the worst in 500 years, with effects in the Colorado River basin that have been considerably more damaging than during the Dust Bowl years, according to scientists at the U.S. Geological Survey. Compounding the problem, the Colorado River had its highest flow of the 20th century from 1905 to 1922, the years used as the basis for allocating the River's water between the Upper and Lower Colorado Basin states under the Colorado River Compact.

Climate change related effects are expected to exacerbate already scarce water resources in many areas of the country. The Intergovernmental Panel on Climate Change's (IPCC) 2007 assessment states that water stored in glaciers and snow cover is projected to decline, reducing water availability to one-sixth of the world's population that relies upon melt water from major mountain ranges. The IPCC also predicts droughts will become more severe and longer lasting in a number of regions.

Although some water efficiency strategies require an initial capital investment, in the long run, conserving water provides significant cost savings for water and wastewater systems. Water efficiency and re-use programs help systems avoid, downsize, and postpone expensive infrastructure projects, by developing new water supplies.

Introduced by Representative Jim Matheson, H.R. 3957 would establish a research and development program within the Environmental Protection Agency's Office of Research and Development (ORD) to promote water efficiency and conservation. The program would collect and disseminate information on water conservation practices. Through this program, EPA will be able to encourage the adoption of technologies and processes that will achieve greater water-use efficiency thereby helping to address the water supply shortages in the United States.

H.R. 3957 would expand EPA's scope and involvement solving the nation's water crisis by researching innovations in water storage and distribution systems, as well as, behavioral, social, and economic barriers to achieving greater water efficiency. In addition, the program will research technologies and processes that enable the collection, treatment, and reuse of rainwater and grey water, waste water from sinks, baths and kitchen appliances.

Background on EPA's Current Water Research and Outreach Programs

EPA currently has no research and development effort that addresses water supply issues. In conjunction with its statutory responsibilities to ensure water quality under the Clean Water Act and the Safe Drinking Water Act, EPA has a program of research and development on water treatment technologies, health effects of water pollutants, security from deliberate contamination, and watershed protection. Current annual funding for these activities is approximately \$50 million. EPA does not have a research and development program to address water-use efficiency or conservation.

In June of 2006, EPA created a voluntary program entitled WaterSense, which focuses on educating consumers about available choices to save money and conserve water. Similar to Energy Star ratings, the WaterSense label indicates the performance of an appliance or product with respect to its water-use efficiency. Products displaying a WaterSense label must achieve water use reductions of at least 20 percent over similar appliances and products. In FY 07, EPA obligated \$2.4 million in funding for the WaterSense program.

Under the program's structure, manufacturers certify that products with the WaterSense label met EPA criteria for water efficiency and performance. Currently, the program has reviewed High-Efficiency Toilets, and plans on expanding its scope to include bathroom faucets, weather-based irrigation controllers, commercial toilets and faucets, and autoclave water valves. EPA estimates that if all U.S. households installed water-efficient appliances, the country would save

more than 3 trillion gallons of water and more than \$17 billion dollars per year. In addition, the average American household could save 20,000 gallons of water per year if it installed an inexpensive low-flow showerhead. A low-flush toilet could reduce their water use by an additional 34 percent.

At present, there is a lack of significant federal research and development aimed at addressing water-use efficiency and conservation, especially focused on residential and commercial uses. Because of the agency's complementary work on water quality, the EPA is the logical federal entity to complete this research due to the important relationship between water supply and water quality.

Current State Initiatives on Water Efficiency

Many states and local governments are taking action to promote greater water-use efficiency and conservation including: metering and sub-metering, rebates for purchase of water efficient products, use of drought tolerant landscaping, processed water use, grey water and rainwater utilization, and correcting infrastructure leaks.

Because water supplies are controlled by local, regional and state government, a variety of approaches are being tested and implemented. While there are many benefits to having a diversity of creative efforts, the establishment of a central repository for information on the approaches and their costs and benefits is lacking. H.R. 3957 directs EPA to gather this information and provide a central location for distributing information about successful projects that have been implemented by communities across the country to achieve greater adoption of technologies and policies on water conservation.

Listed below are some examples of such efforts.

- The city of Tucson, Arizona has been active in the promotion of xeriscaping: a practice of landscaping which does not require supplemental irrigation. Common plants used in this practice include agave, cactus, lavender, juniper, sedum and thyme. Each year, a xeriscaping conference is held in Tucson, as well as a contest awarding the best xeriscaping project. City policy prevents the use of municipal groundwater supplies for irrigating areas within public rights-of-way unless the landscaping uses plants from a low water-use list.
- The State of New York passed legislation to establish a Green Building Tax Credit, which allows building owners and developers to deduct expenses associated with the design and construction of "green" buildings, which includes a number of water-use efficient practices.
- The city of Austin, Texas has instituted a highly successful appliance replacement rebate plan to encourage consumers to purchase water-use efficient toilets, clothes washers, and irrigation equipment. Austin's Water Conservation Program has contributed to a substantial reduction in per capita water use. In 2006, the Austin City Council formed the Water Conservation Task Force to find ways to implement a June 2006 directive to implement aggressive water conservation measures. The anticipated recommendations include changes to the plumbing code, a retrofit on resale for inefficient plumbing

fixtures, mandatory irrigation analyses for large commercial properties, and stricter summer watering regulations. Together, the measures should result in peak-day water savings of nearly 33 million gallons per day at an average cost of roughly \$1.13 per gallon, one-third the cost of building new treatment capacity.

- The Santa Rosa Subregional Reclamation System in Northern California is one of the largest recyclers of water in the world. Last year 6,400 acres of farmlands, vineyards, and public and private urban landscaping was irrigated with recycled water. Of that, 85 percent was used for agricultural purposes. The irrigation system is supported by storage reservoirs that can hold over 1.45 billion gallons of water. The Subregional System serves the cities of Santa Rosa, Rohnert Park, Sebastopol, Cotati, the South Park Sanitation District, and some unincorporated parts of Sonoma County. In addition, the Subregional System pipes its treated wastewater to a geothermal energy plant to be used as re-injection fluid, thereby prolonging the life of the reservoir while recycling the treated wastewater. The addition of wastewater produces close to 85 megawatts of electricity a day, enough to supply the residential energy needs of Santa Rosa.
- The Pennsylvania Water Conservation Leak Detection Program is a joint effort of the Pennsylvania Department of Environmental Protection and the Pennsylvania Rural Water Association (PRWA). PRWA uses set-aside funds to provide two circuit riders to conduct water audits and perform leak detection for small systems (serving fewer than 10,000 persons). Despite the time-consuming nature of the project, the circuit riders have detected 594 leaks and saved over 1.4 billion gallons of water and \$1.36 million annually. From June 2001 to July 2002, 24 systems underwent water audits. A total of 152 leaks were detected, which saved systems over 396 million gallons of water from 36 percent to 9 percent.

Witnesses

Glen Daigger, Vice President at CH2MHill

Dr. Daigger is a Senior Vice President and Chief Technology Officer for CH2M Hill. He received a B.S., M.S., and Ph.D. in Civil Engineering from Purdue University. He is the recipient of numerous awards, including the Kappe and Freese Lectures and the Harrison Prescott Eddy, Morgan, and the Gascoigne Awards from Water Environment Federation. A member of a number of professional societies, Dr. Daigger is also a member of the National Academy of Engineers.

Ed Clerico, CEO of Alliance Environmental and Designer at the Solaire Project in NYC

Mr. Clerico is a licensed professional engineer and licensed wastewater operator in NY, NJ, and PA and is an accredited LEED professional. He holds a B.S. and M.S. in Bio-Ag Engineering from Rutgers University. He was the founder and president of Applied Water Management, Inc. before holding executive roles with American Water as Technical Development Director and VP Strategy. Presently, he operates his own consulting business, Alliance Environmental, and focuses on initiatives that involve integrated water management, including the Solaire project in New York City.

Val Little, Director of the Water Conservation Alliance of Southern Arizona

Ms. Little is the director of the Water Conservation Alliance of Southern Arizona. In addition, she serves as a Principal Research Specialist at the University of Arizona's College of Architecture and Landscape Architecture. She received her A.B. in Landscape Architecture from the University of California, Berkeley, and her M.A. in Anthropology from the University of Arizona.

Ron Thompson, District Manager of the Washington County Water Conservancy District

Mr. Thompson is the District Manager of the Washington County Water Conservancy District. He graduated from Brigham Young University in 1971 with a degree in Accounting and received his law degree from the University of Utah in 1974. Mr. Thompson is a past president of the Utah Water Users Association, vice-chairman of the Resolutions Committee for the National Water Resources Association, and vice-chairman of the Resolutions Committee for the Colorado River Water Users. He also serves on the Board of Trustees of the Utah Water Finance Agency, State of Utah Drinking Water Board, and serves as the Utah representative for the National Water Resources Endangered Species Task Force.

John Veil, Senior Scientist at Argonne National Laboratory

Mr. Veil is the manager of the Water Policy Program for Argonne National Laboratory in Washington, DC, where he holds the rank of senior scientist. He analyzes a variety of energy industry water and waste issues for the Department of Energy. Mr. Veil has a B.A. in Earth and Planetary Science from Johns Hopkins University, and two M.S. degrees, in Zoology and Civil Engineering, from the University of Maryland. Before joining Argonne, Mr. Veil managed the Industrial Discharge Program for the State of Maryland government where he had statewide responsibility for industrial water pollution control permitting through the National Pollutant Discharge Elimination System (NPDES), Underground Injection Control (UIC), and oil control programs.

Section by Section description of H.R. 3957

Title: *Water Use Efficiency and Conservation Research Act 2007*

Purpose: To increase research, development, education, and technology transfer activities related to water use efficiency and conservation technologies and practices at the Environmental Protection Agency (EPA).

Section 1: Short Title

The Water-Use Efficiency and Conservation Research Act.

Section 2: Findings

Section 2 includes the Congressional findings and defines the need for expanding the scope of research and development conducted by the Environmental Protection Agency to include water-use efficiency and conservation to address the problems of increasing water shortages across the country.

Section 3: Research Program

Section 3 directs the Assistant Administrator to establish a research, development, and demonstration program within the Environmental Protection Agency's Office of Research and Development to promote water-use efficiency and conservation. The bill provides examples of several areas the program should address including water storage and distribution systems; and behavioral, social, and economic barriers to achieving greater water-use efficiency. In addition, the bill states the program should research technologies and processes that enable the collection, treatment, and reuse of rainwater and greywater. The specific projects selected for funding through the program should reflect the needs identified by local and state water managers.

Section 4: Technology Transfer

Section 4 directs the Assistant Administrator to collect and disseminate information on current water-use efficient and conservation technologies and practices to facilitate their adoption. This information should include incentives and impediments to development and commercialization, best practices, and anticipated increases in water-use efficiency resulting from the implementation of these processes.

Section 5: Report

Section 5 directs the Assistant Administrator to report to Congress on the progress being made by the Environmental Protection Agency with regard to the research projects initiated, and the outreach and communication activities conducted through the program.

Section 6: Authorization of Appropriations

Section 6 provides a five year authorization of the program with such sums as necessary to carry out the program.