

DRINKING WATER

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Drinking water infrastructure in Pennsylvania faces a required investment of \$13.9 billion over the next 20 years to replace aging facilities and comply with safe drinking water regulations. Although waterborne outbreaks are low, the number of incidents has been on the rise. Encouragingly, the number of drinking water systems in violation of clean water regulations has seen improvement. Funding research into new water treatment technology as well as reducing waste and consumption will help reduce costs, but construction and repair of drinking water facilities will require a steady source of funding. Drinking water systems must adopt full-cost pricing in water billing to reflect operational and maintenance costs as well as raising funds for eventual replacement. If funding needs are not met, the state risks reversing the public health, environmental and economic gains that have been made over the past three decades.

BACKGROUND

In 1900, the average residential usage of potable water in Pennsylvania was five gallons per day per person; today that number is 62 gallons per day per person. One million Pennsylvania households rely on 450,000 individual wells, and more than nine million people rely on the Commonwealth's 323 largest community drinking water systems alone. The Pennsylvania Department of Environmental Protection (PADEP) regulates nearly 10,000 community drinking water systems which serve more than 10 million people. While the majority of the public water systems draw from ground water sources, the 575 public water systems that use surface water serve more than 75 percent of the 12 million residents of the Commonwealth. Currently, for many households, water remains relatively inexpensive, comprising less than one percent of household income. Because most water systems do not adequately account for investment needs, residents are receiving water at rates that are greatly below cost, and the systems are not generating sufficient revenue to finance investment.

CONDITIONS AND CAPACITY

In 2013, the U.S. Environmental Protection Agency (EPA) updated its national survey of drinking water infrastructure needs on a state-by-state basis. The survey results concluded that approximately \$13.9 billion would be needed over 20 years to repair, replace and upgrade the Commonwealth's community drinking water systems.

Improved water quality regulations were enacted under the 1984 Safe Drinking Water Act (SDWA) and have reduced the occurrence of waterborne outbreaks of disease to nearly zero, the number of community drinking water systems in violation of the regulations is trending upwards. According to Pennsylvania Department of Environmental Protection's (PADEP) *2012 Public Water System Compliance Report*, PADEP staff completed 7,237 enforcement actions across the state with over \$360,000 in penalties being assessed.

FUNDING AND FUTURE NEED

Federal assistance has not kept pace with demand for drinking water infrastructure improvements. Since 1997, Congress has averaged between \$700 million and \$850 million annually for the SDWA's State Revolving Loan Fund (SRF) program, enacted in 1987. The FY 2012 allocations for the SRF included a \$26.3 million designation for Pennsylvania, while the amount dropped to \$24.67 million in 2013.

According to a report issued by the Sustainable Task Force on Infrastructure published in 2008, the estimated capital investment for improvements to Pennsylvania's drinking water system is estimated to be \$11.5 billion over the next 20 years (estimated in 2007 dollars). This estimate falls in line with the USEPA's estimates listed above.

When the current water usage rates are compared with the available funding from state and Federal agencies over the next 20 years, a funding gap of \$8.1 billion appears, with over half of the gap being for systems serving less than 3,300 people. It should be noted that the funding gap between projected water investment needs and current spending levels is dependent upon the growth of user rates. The gap would be approximately \$3.7 billion if rates are raised to a level comparable to 1.5 percent of median household income (MHI).

The gap analysis provides a starting point for the magnitude of Pennsylvania's drinking water infrastructure funding issues. While the data available represents a reasonable effort to quantify the funding gap, more detailed statewide data would further assist in more accurately quantifying the problem and projecting the impact of potential remedies.

In 1988, Pennsylvania created the Pennsylvania Infrastructure Investment Authority (PENNVEST) to help communities finance infrastructure investments. PENNVEST serves as the financing agency for the Federal drinking water SRF authorized by the 1996 Safe Drinking Water Act Amendments. Since 1988, PENNVEST has funded more than \$1.5 billion in water supply infrastructure improvement projects.

Increased Federal subsidies for drinking water needs would help finance required investment, but Federal support cannot be expected to address the entire program. Operation and maintenance (O&M) costs are not eligible for Federal funding and must be borne entirely by local utilities. Therefore, water system customers will be forced to pay for the vast majority of the needed investments not funded by the Federal or state governments.

Clean and safe water is provided for the public good; therefore, the central question becomes, to what extent can and will ratepayers pay for needed investment? While rate increases will not adversely affect most households, many low-income families may not be able to afford the added expense.

POLICY OPTIONS

Clean and safe water is no less a state priority than are adequate roadway systems and a

safe and efficient aviation system. New solutions are needed for what amounts to more than \$13.9 billion in critical drinking water investments that Pennsylvania will require over the next two decades. If investment needs are not met, the state risks reversing the public health, environmental and economic gains that have been made over the past three decades.

Without a significantly enhanced Federal role in providing assistance to drinking water infrastructure, the role of critical investments will fall to Pennsylvania. The case for state assistance to address the unprecedented needs is compelling. In many locations, public water systems cannot be expected to meet this challenge alone, or these communities face losing competitive economic advantage to neighboring communities, other regions and states due to inordinately high utility rates. Additionally, because source waters are shared across local boundaries, the benefits of state help will be realized by entire regions of Pennsylvania.

Equally compelling is the case for flexibility in the forms of state investment, including grants, loans and other forms of assistance. Increasingly, grants will be needed for many communities that simply cannot afford to support the cost to meet public health, environmental and/or service-level requirements. Loans and credit enhancements may be sufficient for public water systems in communities with greater economies of scale, wealthier populations, and/or fewer assets per capita to replace. Other possible investment solutions include trust funds and incentives for private investment.

RECOMMENDATIONS

The four Pennsylvania Sections of the American Society of Civil Engineers (ASCE) encourage the Commonwealth to support much needed water Infrastructure funding going forward. By increasing state and/or Federal funding on drinking water infrastructure improvements, the demand of usage rate increases can be lessened. While the Governor's Report Card has gone further to catalog the need than the USEPA's previous studies and management improvements have been made as a result of the Capacity Enhancement Program, there are still significant improvements needed.

In addition, the Sections support the following recommendations:

Focus on technology

State government can play an essential role in promoting research, development, testing and evaluation of new technologies and the dissemination of information about proven technologies. ASCE supports state-funded research into water and wastewater treatment technology, which may reduce capital expenditures as well as O&M costs. By creating research partnerships with universities throughout the state, Pennsylvania may reap additional economic benefits through public-private partnerships and licensing of new technologies.

Regulators, engineers and drinking water operators tend to be conservative when it

comes to adopting new technologies which exist to clean and repair old pipes, providing low-cost alternatives to replacement of distribution mains. New pipe materials can also reduce water leaks, thereby reducing demand. In order to gain acceptance by the drinking water industry, these new technologies must be supported by full-scale demonstrations. A further example is the adoption of Smart Technology in water metering. Water meters are the direct link between the distribution system, the consumer, and the billing department. Over time, the aging meters begin to wear down and allow un-billed water to pass by the meter without being read. Estimates from meter replacement programs show that providers could be under-billing the customers by as much as 35 percent because of meter reading issues. With the advances in metering technology, and the introduction of no-moving-parts meters, customers can be more accurately billed for the water they actually use and the water systems can be better able to track water usage to determine the presence of a leak in near real time. Proper billing can help to reduce the funding gap without an official rate increase.

Promote sustainable infrastructure initiatives

In many cases, the approach towards public infrastructure is reactive. Systems are built and operated with minimal maintenance until they wear out. Water systems need to conduct a full accounting of the costs to manage their assets both for current operations and future infrastructure needs. By appropriately managing its assets, a system may be able to reduce the overall investment required. In order to close the funding gap, state governments can take several actions. They must support programs that will make infrastructure more sustainable and promote better asset management techniques that will reduce long-term costs and improve performance, including water reuse. They must encourage strides in water efficiency, which will reduce drinking water consumption and the volume of wastewater to be treated, and advocate for full-cost pricing of water and wastewater treatment. Finally, they must support the reduction of non-point-source pollution of water sources.

Full-cost pricing

Advocating for full-cost pricing on water billing to ensure that future repairs, distributions needs, and future treatment are accounted for in current water rates.

Provide reduced rates to the disadvantaged

In order to cushion the impact of rate increases on low-income households, the State should either: a) encourage municipalities to use lifeline rates for low-income households or b) develop a rate reduction program similar to the Federal low-income Energy Assistance Program.

Issue state bonds

With decreasing Federal funding for the SRF program, Pennsylvania should leverage the remaining Federal dollars as collateral for the issuance of state bonds — effectively doubling the amount of capital available for infrastructure investments.

Protect water sources in farming communities

Continue to fund low-interest loans to farmers, so that they may implement best management practices for land management and manure handling and storage to protect drinking water sources.

Develop Standards for Private Water Wells

Currently, no standards exist for private wells. These wells are a potential access point for contamination of the state's groundwater supplies. Standards for private well construction would mandate best practices so private wells protect the Commonwealth's resource from potential contamination.

Environmental Infrastructure Needs Inventory

Support the establishment of an evolving statewide environmental infrastructure needs inventory to be administered by the state's municipal planning organizations. This inventory would serve as a mechanism to differentiate between expenditures for current consumption and long-term investment, and would reduce major inefficiencies in the planning, design and construction process for long-term investments. An infrastructure needs inventory would help to increase public awareness of the problems and needs facing the state's physical infrastructure, and would help the state legislature to focus on programs devoted to long-term growth and productivity. We would recommend including a 5-year projection of future needs on the current permit renewals process in order to accurately generate an accurate infrastructure needs inventory utilizing an existing permitting process.

SOURCES

- United States Environmental Protection Agency, *Drinking Water Infrastructure Needs Survey and Assessment* 2013
- United States Department of Homeland Security, *Water Sector-Specific Plan*, 2010
- Edward Rendell, Governor's Sustainable Infrastructure Task Force Report, *Creating a Sustainable Solution for Pennsylvania*, 2008
- Pennsylvania Department of Environmental Protection (PADEP), *Governor's Report on the Capacity Enhancement Program*, 2011
- PADEP, *Pennsylvania Public Water System Compliance Report for 2012, 2013*

ASCE POLICY STATEMENTS

- ASCE Policy Statement 299: [Infrastructure Investment Policy](#)
- ASCE Policy Statement 361: [Implementation of Safe Drinking Water Regulations](#)
- ASCE Policy Statement 420: [Clean Water Act Reauthorization](#)
- ASCE Policy Statement 422: [Watershed Management](#)

- ASCE Policy Statement 453: [Federal Capital Budgeting](#)
- ASCE Policy Statement 480: [Water Infrastructure and Facilities Construction Funding](#)