

# WASTEWATER

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## 2010 Report Card for Pennsylvania's Infrastructure

D+

*Aging wastewater management systems discharge billions of gallons of untreated sewage into Pennsylvania's surface waters each year. It is estimated that the state must invest \$2 billion over the next 20 years to repair existing systems, upgrade existing systems to meet regulatory requirements and expansion of existing systems or build new systems to meet increasing demands. Increased state funding and the American Recovery and Reinvestment Act (ARRA) of 2009 have resulted in PENNVEST grant and loan awards for sewer projects amounting to \$65 million dollars or half the annual need required to meet the \$25 billion required. The 2009 PENNVEST sewer project funding coupled with the \$400 million dollar H2O Pennsylvania grant program being dispersed during 2009 and 2010 is an increase alone of 340 percent from 2008—but it is still short of the projected need, and Federal assistance alone cannot fill the gap.*

### BACKGROUND

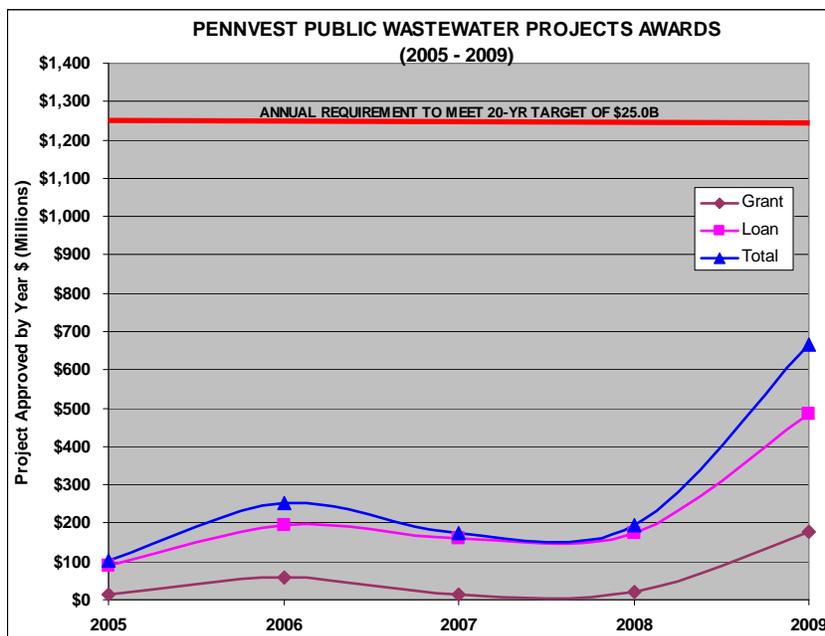
Clean and safe water is critical for human health, ecological health and maintaining local and national economies. Advances in wastewater treatment initially made at the turn of the 20<sup>th</sup> Century helped alleviate epidemics of typhoid, cholera and other waterborne diseases. Further advances during the 1970s improved environmental health, increasing fish and shellfish populations in the waters of the commonwealth.

Pennsylvania is now facing a large financial burden due to the simultaneous expiration of the useful life of wastewater infrastructure installed at different times. Treatment plants typically have an expected useful life of 20 to 50 years before they have to be expanded or rehabilitated. Pipes have life cycles ranging from 15 to 100 years, with actual pipe life varying depending on soil conditions, pipe material and capacity requirements. In some cities in the state, some pipes are approaching 200 years old. This is occurring at a time when funding for wastewater has been continually decreasing. Nationally, the U.S. Environmental Protection Agency (EPA) indicates research and development expenditures on more efficient and affordable technologies in water and wastewater treatment have decreased by half since the early 1970s.

By the end of 2004, the Pennsylvania Department of Environmental Protection (PADEP) had assessed 83,161 miles, or 82 percent, of the total stream miles in the state. As many as 10,762 stream miles, representing 18 percent of the assessed and 13 percent of the total stream miles and 60 percent of lake area in Pennsylvania are classified as impacted due to on-lot sewer systems, stormwater runoff, agricultural activities, acid mine drainage and wastewater discharges. Without adequate spending on the state's water infrastructure, we face the real risk of losing the environmental gains achieved over the last three decades.

According to the Governor's Sustainable Task Force on Infrastructure's report, published in November 2008, the estimated capital investment for improvements to the wastewater system is estimated to be \$25 billion over the next 20 years (estimated in 2007 dollars). This estimate falls in line with previous EPA estimates. With current operating costs and at current user rates, there is a total funding gap of \$28.3 billion over the next 20 years.

Pennsylvania created the Pennsylvania Infrastructure Investment Authority (PENNVEST) in 1988 to help communities finance infrastructure investments. PENNVEST serves as the financing agency for the clean water state revolving loan funds authorized by the Clean Water Act. In 2009 alone, PENNVEST awarded approximately \$660 million dollars in loans and grants for funding of public wastewater infrastructure projects in Pennsylvania—an increase of 230 percent. In November 2008, Pennsylvania voters approved a \$400-million bond issue on water and wastewater infrastructure. This grant program is administered by the Commonwealth Financing Authority and is in its second year. The graph below illustrates the PENNVEST grants and loans awarded since 2005 and the projected funding gap in the governor’s report.



DATA Source – PENNVEST WEBSITE – BOARD MEETING PROJECT AWARD SUMMARY

The grade of D+ reflects a more than \$25.0 billion funding gap, incomplete data at the state level, increasing violations and the potential threat to public health, the environment and the economy.

## CONDITIONS

The 2004 Needs Survey conducted by EPA and published in January 2008 indicates that Pennsylvania’s wastewater infrastructure needs an investment of \$7.2 billion. More than \$1 billion is need for treatment, \$1.4 billion for sewer rehabilitation and separate sewer wet weather issues and \$4.6 billion for combined sewer overflow correction.

As of 2006, more than one-third of Pennsylvanians used on-lot sewer disposal, for a total of 1.2 million homes. National failure rates for onsite sewage treatment and disposal systems are reported at 10 percent annually by EPA. Using this figure, 120,000 on-lot systems are failing annually; however, estimates of failure rates range upwards of 20 percent in Pennsylvania due to the frequent occurrences of soil conditions unsuitable for on-lot systems. PADEP has reported that onsite systems failures are implicated in 149 impaired stream miles and 6,110

impacted lake-acres. Contamination of groundwater and surface water by failing or substandard septic systems is a considerable risk in much of Pennsylvania due to the state's geology, soils, land development patterns and large number of aging systems.

PADEP has reported that runoff, including urban runoff and storm sewers, road runoff and small residential runoff, is implicated in the impairment of more than 3,000 stream miles and 97 lake-acres in Pennsylvania. Additionally, acid mine drainage is responsible for the impairment of more than 4,000 stream miles and non-point source discharges from agricultural activities are implicated in the impairment of nearly 4,000 stream miles.

Concentrated animal feed operations are growing in size and number in Pennsylvania. Economies of scale and modern technologies are driving the establishment of these new concentrated livestock and poultry operations. The increased efficiencies are necessary for the Pennsylvania agriculture industry to stay competitive in the U.S. and abroad. PADEP has adopted policies to address the potential pollution these facilities may produce. Low-interest loans have been made available to farmers to implement best management practices for manure handling and storage and land management to protect water sources. Additionally, Pennsylvania is a nationwide leader in implementing a watershed-based total maximum daily load nutrient discharge limit program in the Susquehanna River watershed in a multi-state attempt to stop the drastic decline in the ecological health of the Chesapeake Bay. In 2008, Senate Resolution 224 called for the Legislative Budget and Finance Committee (LB&FC) to study the economic impact on municipal wastewater dischargers to comply with the Chesapeake Bay Tributary Strategy (CBTS). The resulting study estimated the capital cost for nutrient removal at \$1.4 billion and the increase in annual operations and maintenance cost for nutrient removal is \$61 million per year.

In 2009, PADEP was investigating sources of total dissolved solids (TDS) in the Monongahela River. As a result of elevated TDS in the Monongahela, some new wastewater treatment plants had a TDS limit in their permit. It is not known at this time if TDS limits will be imposed on all wastewater treatment plants discharging to the Monongahela or if a statewide TDS limit will be proposed. A majority of sewage treatment plants are not equipped to remove TDS and proposed limits will require new treatment technologies be identified, evaluated and permitted.

PADEP has reported that wastewater handling and treatment, which includes municipal point source discharges, on-site wastewater treatment and combined sewer overflows, are implicated in the impairment of 744 stream miles. Nationwide there are 9,471 combined sewer outfalls (CSO) nationwide in 32 states—1,569 of which are in Pennsylvania, making it the state with the most CSOs. The PADEP has identified 152 communities in the commonwealth that are currently operating with CSO discharges. When sewers were first installed in Pennsylvania, combined sewage systems were used to convey sewage to the nearest waterway. These systems provided a great convenience to cities and towns. Sewage and industrial waste was commonly disposed of into waterways. At the time, streams and rivers were not thought of as recreational areas, but instead were used for transportation and waste removal. Only relatively recently has the public perception of waterways changed to conceptualize waterways as recreation, conservation and preservation areas. Recent regulatory and fiscal pressure placed on communities throughout the commonwealth by the EPA and the PADEP to upgrade, repair and replace aging CSO systems has often exceeded the financial abilities of many municipalities.

Clean and safe water is a public good; therefore, the central question becomes to what extent can and will rate payers pay for needed investment. Many systems do not adequately account

for their investment needs and charge rates below costs, generating insufficient revenue to finance investment. For many households sewage treatment remains relatively inexpensive, comprising less than 1 percent of household income. However, many low-income households will not be able to afford higher sewer rates.

The nation's wastewater infrastructure and Pennsylvania's combined sewer systems represent nearly a century of investment, substantially funded by local taxpayers. The federal government has directly invested more than \$72 billion in the construction of publicly owned sewage treatment works (POTWs) and their related facilities since passage of the Clean Water Act in 1972. Nevertheless, the physical condition of many of the state's wastewater treatment systems is poor, due to a lack of investment in plant, equipment and other capital improvements over the years.

Federal funding under the Clean Water Act State Revolving Loan Fund (SRF) program has remained flat for the past decade. There was an increase in PENNVEST project awards in 2009, primarily due to American Recovery and Reinvestment Act (ARRA) funding.

The House Transportation and Infrastructure Committee stated the issue bluntly: "Without increased investment in wastewater infrastructure, in less than a generation, the U.S. could lose much of the gains it made thus far in improving water quality, and wind up with dirtier water than existed prior to the enactment of the 1972 Clean Water Act."

In November 2008, the Governor's Infrastructure Task Force released a detailed gap analysis, which assessed the difference between current spending for wastewater infrastructure and total funding needs. The Task Force's Gap Analysis estimated that, over the next two decades, Pennsylvania will have a funding gap of more than \$28.3 billion for capital project costs and for operation and maintenance, replacement and repair, and debt retirement.

The Task Force made the following recommendations for more efficient water infrastructure management:

- Increasing user rates incrementally over time;
- Increasing funding in federal and state assistance; and
- Reducing costs through effective management, asset management, efficient operations, regionalization and rightsizing of systems, and maximization of innovative and nonstructural solutions.

Increased federal subsidies for clean water needs would help finance required investment, but federal support can not address the entire need. Operation and maintenance costs are not eligible for federal funding and must be borne entirely by the local utilities. The wastewater system customers will be forced to pay for the vast majority of the investments—those not funded by the federal government or the state.

The 2009 budget cuts and furloughs at PADEP have resulted in cutbacks to the Wastewater Operator Certification program and reductions in staffing in Wastewater Engineering/Planning sections of DEP. According to PADEP, a hold has been placed on the processing of new operator certification applications as a result of this cutback. The reduction in staffing in the PADEP Wastewater Engineering/Planning Sections has reduced staffing in areas where an increase in staffing was already needed. In addition, the budget cutbacks have forced the PADEP to propose new permit fee structures that will make the permitting of wastewater

treatment systems self-sufficient. An example of this increase is that a plant treating between one million gallons per day (mgd) and five mgd would currently pay \$500 for permitting every five years. It is proposed to increase to \$2,500 for a new permit, \$1,250 for permit renewal and an annual fee of \$1,250 in the non-issuance years, for a total five-year permitting cost of \$6,250 versus the previous \$500.

## POLICY OPTIONS

If Pennsylvania fails to meet the investment needs of the next 20 years, it risks reversing the public health, environmental and economic gains of the past three decades.

Many of the national primary drinking water regulations have included opportunities for states to reduce costs by tailoring requirements to the conditions actually experienced by their drinking and wastewater systems. States can only make use of this flexibility if they have adequate staff and administrative support to make case-by-case determinations necessary to grant variances and exceptions available under EPA's rules. Funding shortfalls in state budgets are magnified at the local level by rigid one-size-fits-all prescriptions that often result in inefficient expenditures of capital when more affordable or new innovatively efficient technologies could have been used.

In many cases, the approach toward public infrastructure is to build it and operate it with minimal maintenance until it wears out. Wastewater systems need to conduct a full accounting of the costs to manage their assets both for current operations and future investments needs. By appropriately managing its assets, a system may be able to reduce overall investment needs.

Regulators, engineers and wastewater operators tend to be conservative when it comes to adopting new technologies. New technologies exist to clean and repair old pipes that provide low-cost alternatives to replacing collection mains and sewers. New pipe materials can reduce ground water infiltration into sewers and new high-efficiency fixtures can reduce water demand. These new technologies must be supported by full-scale demonstrations to gain acceptance by the clean water industry.

The case for increased federal investment to assist Pennsylvania and other states is compelling. Needs are large and unprecedented; in many locations, local sources cannot be expected to meet this challenge alone and, because waters are shared across local and state boundaries, the benefits of federal help will accrue to the entire nation. Clean and safe water is no less a national priority than are national defense, an adequate system of interstate highways, and a safe and efficient aviation system. Many other highly important infrastructure programs enjoy sustainable, long-term sources of federal backing, often through the use of dedicated trust funds; under current policy, water and wastewater infrastructure do not.

## RECOMMENDATIONS

The Pennsylvania sections of the American Society of Civil Engineers encourage the commonwealth to support much needed wastewater infrastructure funding going forward. By increasing state and federal funding on wastewater infrastructure improvements, the demand of usage rate increases can be lessened.

In addition, the sections support the following recommendations. First, the state should issue state bonds. With the decreasing federal funding for the State Revolving Loan Fund (SRF) program, Pennsylvania should leverage the available federal funds that remain, using them as collateral for the issuance of state bonds, effectively doubling the amount of funds available for infrastructure investments.

The state should also 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 at state supported universities, into wastewater treatment technology, which may reduce capital expenditures, as well as operation and maintenance costs, and create potential economic benefits through public-private partnerships licensing the new technologies. Staff increases at the state level in DEP are required for evaluation/permitting of new technologies; current staff levels do not permit for enough manpower to effectively evaluate new technologies which includes “green” improvements.

Third, the state should create an infrastructure needs inventory, which would help increase public awareness of the problems and needs facing the state's physical infrastructure and help the state legislature focus on programs devoted to long-term growth and productivity. We would recommend including a five-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.

Fourth, the state should promote sustainable infrastructure initiatives, which would close the funding gap by promoting better asset management techniques for reducing long-term costs and improving performance; promoting water efficiency, which reduces water consumption and the volume of wastewater to be treated; advocating full-cost pricing of water treatment; and supporting reduction of non-point source pollution of water sources.

Fifth, the state should consider advocating for full-cost pricing on water billing to ensure that future repairs, distribution needs and future treatment are accounted for in current billings. This might require that the state also provide reduced rates to the disadvantaged.

Last, Pennsylvania should protect water sources in farming communities by continuing to fund low-interest loans to farmers to implement best management practices for manure handling and storage and land management.

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