PENNSYLVANIA GENERAL ASSEMBLY

JOINT LEGISLATIVE AIR AND WATER POLLUTION CONTROL AND CONSERVATION COMMITTEE

INFILTRATION AND INFLOW

REPORT OF THE INFILTRATION TASK FORCE

February, 2002

TO: **All Members of the General Assembly**

FROM: **Representative Scott E. Hutchinson, Chairman**
Senator Raphael J. Musto, Vice Chairman

SUBJECT: **Infiltration and Inflow Report**

DATE: **February 4, 2002**

House Resolution 376, Printer's Number 3182, adopted on October 5, 1998, directed the Joint Legislative Air and Water Pollution Control and Conservation Committee (Committee) to study the issues concerning the infiltration of extraneous water into municipal sewer systems. In early 1999, the Committee held two public hearings and released its report in the fall of the year. The Committee's report on the infiltration of water into sewage treatment systems recommended the creation of a task force to develop strategies to address infiltration issues.

More than two dozen stakeholders (representing state and municipal government, related industries and engineering firms, and interested organizations, associations and authorities) were asked to volunteer their time and expertise in the development of this report. The Infiltration Task Force held four meetings to review the extent of the infiltration problem; strategies to better manage and control infiltration; and options that might encourage better management of infiltration.

The discussion at these meetings revolved around four specific concerns: developing a long-term financing strategy, asset management strategies, uniform construction codes, and service lateral rehabilitation. The recommendations adopted and presented in this report are the culmination of efforts on the part of the Task Force members. Representative Julie Harhart served as chairperson of the Task Force.

RECOMMENDATIONS

Many of the key issues need to be addressed at the local wastewater utility level. Wastewater utilities should develop a comprehensive local strategy that includes:

1. **Wastewater utilities should incorporate asset management guidelines in their policies. The limited financial resources of wastewater programs must be allocated to address the most critical problems first. Asset management policies involve cataloguing every aspect of the sewer system, giving it a rating or a sense of longevity and the need for rehabilitation, and then developing a long-term plan for sewer rehabilitation.**

2. **Much like the Pennsylvania Infrastructure Investment Authority (PENNVEST), the task force recommends the regionalization of wastewater systems as a means to pool resources. Reducing duplication of wastewater services could mean savings for ratepayers. Currently, PENNVEST uses a rating system to prioritize projects that have applied for funding. One of the criteria is whether the project encourages consolidation of systems. Asset management's long-term planning would replace current piecemeal fixes with the potential for a much greater regional approach than has been used before.**

3. **Wastewater utilities should work with the public and the Pennsylvania Department of Environmental Protection (DEP) to increase awareness of the infiltration problem. A public education program (such as written materials and public service announcements) serves the dual function of providing ratepayers with important information about their wastewater systems and building support for needed investments in infrastructure.**

4. **Wastewater utilities need to ensure that local sewer rates reflect the full cost of service, including appropriate capital assets maintenance and replacement. Wastewater systems were paid for and installed by previous generations and represent a huge capital expense. Ultimately, ratepayers will be responsible for the replacement of the wastewater infrastructure.**

Local governments also need to address wastewater problems. The local government role should include:

5. **Local governments should use existing regulatory controls to assist wastewater utilities in reducing infiltration related problems. Currently, there are communities that have ordinances that impact wastewater repairs and inspection. For example, there are local ordinances that require property owners to repair failing laterals and remove direct sources of extraneous water (inflow) from downspouts and sump pumps. There are also ordinances to require lateral observation tees to be installed in new construction.**

6. **Local governments should improve inspection criteria for private laterals. For example, requiring developers to pressure test each lateral and using an independent inspector to ensure hook-ups were constructed properly would help to reduce infiltration related problems. To ensure that infiltration from older homes is reduced, local governments may want to require a lateral inspection with the re-sale of residential housing. Some local ordinances require inspection and correction of certain lateral related problems for a real estate transaction to be legal.**

7. **Local governments need to consider establishing a financial assistance program to help homeowners with the cost of repairing existing laterals. Funding for a lateral assistance program could be provided through a budget appropriation, municipal bonds, or insurance programs.**

Pennsylvania also has an important role to play in addressing wastewater infrastructure needs. State decision makers should consider how changes in legislation and policy could help address some of the challenges detailed in this report. The state role should include:

8. **The Pennsylvania Department of Environmental Protection should consider implementing minimum design specifications for the wastewater industry. The standards should meet local, state, and national wastewater requirements and goals. The Pennsylvania Utility Contractors Association has prepared a document that highlights specifications that are potential candidates for standardization. The task force recommends that state funding should be tied to projects that meet these minimum standards.**

9. **PENNVEST should recognize infiltration as a critical part of wastewater programs by offering greater priority to rehabilitation of existing infrastructure in older communities. An infiltration strategy should ensure that financial and technical assistance is adequate to help local**

governments design, implement, and evaluate appropriate infiltration reduction measures including the rehabilitation of wastewater systems.

10. **The state should consider the creation of a Pennsylvania Infrastructure Advisory Board. The Advisory Board would help target state infrastructure investment toward resolving high-priority problems. Among the issues that might be examined by the Advisory Board is alternative funding for wastewater projects. Specifically, two funding alternatives that should be considered are a "Clean Water Trust Fund" and "Lateral Insurance Programs".**

The federal government has a critical role in addressing wastewater infrastructure needs. The federal role should include:

11. **The federal government should significantly increase federal funding for projects to repair, replace, or rehabilitate wastewater infrastructure. The task force recommends the Pennsylvania General Assembly adopt a joint resolution asking the United States Congress to increase federal funding for wastewater infrastructure programs.**

12. **The federal government should strengthen wastewater research and development programs. The EPA should support a fully-coordinated and expanded research effort. This effort should be open to input from state and local governments and the wastewater industry. Research should be focused on all aspects of wastewater collection, treatment, and peak wet weather flows during wet weather episodes.**

BACKGROUND

Infiltration of extraneous water into sewer systems is a chronic and growing problem across Pennsylvania. Many of the state's sewage collection systems are aging; some sewers are 100 years old. Many systems have not received the essential maintenance and repairs necessary to keep them working properly. The lack of attention to these systems has resulted in deteriorated pipes that allow large volumes of extraneous water to infiltrate via holes and cracks throughout the entire collection system.

A key part of maintaining a wastewater system depends on maintaining the piping within the system. Wastewater systems need regular monitoring and maintenance just like other infrastructure systems. However, because they are located underground, problems often go unnoticed until major complications surface in the community, such as sewer backups, flooding, collapsed streets, or contamination of nearby water resources.

FINANCING STRATEGIES FOR REHABILITATION PROGRAMS

Wastewater systems need to make the transition from what has been a cost-effective path of repairing their pipe networks to replacing large amounts of buried infrastructure that is now near the end or past its expected lifetime. Although the federal government has spent more than $71 billion on wastewater programs since 1973, the nation's 16,000 wastewater systems still face enormous infrastructure funding needs to replace pipes and other facilities that have exceeded their design life. Estimated costs to remedy existing sewage infrastructure problems in Allegheny County alone may exceed $3 billion.

For many utilities the demand for investment in wastewater infrastructure will present a significant challenge. The primary issue is how to finance the backlog of repairs and rehabilitation that is necessary while keeping the utility rates to customers at acceptable levels. Meeting this challenge requires a combined effort from ratepayers, wastewater utilities, and government at all levels.

The case for federal investment is compelling. Wastewater needs are large and unprecedented. In many locations, local sources cannot be expected to meet this challenge alone. Because waters are shared across local and state boundaries, the benefits of federal help will accrue to the entire nation. Since 1989, the EPA has provided $512 million for use in Pennsylvania's Clean Water State Revolving Fund.

The Pennsylvania Infrastructure Investment Authority (PENNVEST) manages the state's revolving loan program. In July 2001, PENNVEST approved $118 million in low-interest loans and $13 million in grants for 52 drinking water, wastewater, and stormwater projects. The funding for the projects brings PENNVEST's total funding for community water and sewer projects to more than $2.7 billion since the program's inception. PENNVEST funding, however, is primarily devoted to converting unsewered areas served primarily by on-lot systems to sewage conveyance systems and treatment plants. Currently, the rehabilitation of sewers in existing urban areas receives a lower ranking priority under the PENNVEST loan rating system.

While PENNVEST has provided significant funding for wastewater projects, many ascertain that federal and state funding alone is not, and will not be enough to assist municipalities and utilities in meeting their wastewater infrastructure needs and bridging the anticipated funding gap.

The task force examined several alternatives to augment state and federal funding. One funding alternative receiving attention is the use of a "Clean Water Trust Fund". Task force members were given a presentation on the economic and environmental benefits of a proposed "Clean Water Trust Fund". The fee would be levied on all public and private water utilities through regular water bills, and measured in cents per 1,000 gallons used. It is estimated that a 20-cent user fee would raise $189 million a year for water infrastructure needs. The cost to the average homeowner would be $2 a month. The fund could be allocated in the following manner: 25 percent would remain in the local community (to be used for capital improvements of water and sewer systems), and the remainder would be made available to PENNVEST to be used as grants.

A similar long-term approach might be to offer insurance for customers that are experiencing problems with their service laterals. Several states have programs whereby municipalities may implement a sewer lateral insurance program to assist homeowners with the cost of lateral repairs. All residential properties within a community are assessed an annual fee to fund the program. The program protects homeowners from potentially large, unexpected repair costs. When a resident's service lateral needs to be repaired, the costs will be borne by the insurance fund. The program allows the owner of a residence to recover up to 100 percent of the authorized costs to repair defective sewer laterals serving his or her property. For example, since 1998, when Missouri passed its lateral insurance legislation, more than 40 municipalities have approved insurance programs.

Local funding, however, will remain an integral part of any wastewater rehabilitation program. Many older cities and small communities in Pennsylvania are

faced with dwindling populations. Facing a rise in infrastructure replacement needs, compounded by the problem of a shrinking customer base, wastewater utilities face a significant challenge in keeping rates affordable for all the people they serve.

ASSET MANAGEMENT OF WASTEWATER INFRASTRUCTURE

The public demands the highest level of public services and expects that their tax dollars will be wisely used to provide those services. As a result, the wastewater industry has the responsibility to ensure that the systems are operating efficiently and in a cost-effective manner. Asset management guidelines can play an important role in this respect.

Asset management is a cost-effective, systematic process of maintaining, upgrading, and operating infrastructure assets. An asset management philosophy focuses on the benefits of investment, as well as its cost, and takes a comprehensive view of the entire portfolio of wastewater resources. Objective, fact-based tools and techniques are systematically applied to determine how best to deploy available resources in order to achieve system-wide goals. Asset management is an improved way of doing business that responds to an environment of increasing system demands, aging infrastructure, and limited resources.

Asset management has come of age because of changes in the wastewater environment, changes in public expectations, and advances in technology. Today's wastewater system is characterized by high user demand, budgets stretched by significant and growing requirements, declining staff resources, and a collection system that is experiencing ongoing deterioration.

Asset management provides a framework for handling both short-term and long-term planning. The Philadelphia Water Department is taking advantage of asset management and using tools such as geographic information systems and new technology to assist in the decision making process. Asset management can help identify and plan for needed investment decades in advance of the actual need for funds. The South-Central Assembly for Effective Governance is formulating a five-year work plan to establish a regional asset management strategy for all publicly owned infrastructure.

UNIFORM CONSTRUCTION CODES FOR WASTEWATER SYSTEMS

The regulation of the design and construction of wastewater infrastructure in Pennsylvania is conducted by local jurisdictions and is typically fragmented, uncoordinated, and unpredictable. This often leads to unnecessary added costs to construction. Several members of the task force expressed strong concerns about the barriers created by lack of uniformity in construction standards. Anything that creates additional work or unnecessary confusion within the industry that performs the services necessary for the corrective actions understandably adds costs.

One of the biggest culprits of this is the inconsistency with which municipalities and municipal authorities specify their bidding and work process. Each of the many hundreds of such authorities along with the mix of still other hundreds of engineering firms throughout the state have developed their own criteria for design, materials, procedures, construction and bidding processes. The lack of uniform codes has created thousands of different and unique specifications and designs for a contractor to try and understand, obtain competitive material pricing, and to assemble a bid that is competitive enough to fall within the budgets that are available.

The benefit to a single wastewater construction building code would be to eliminate confusing local code interpretations and outdated construction ordinances. It will enable contractors to better control construction costs. Uniform codes in the wastewater industry would bring about substantial savings by virtue of more competitive bids because contractors would be doing things routinely rather than by constantly adapting to new specifications.

SERVICE LATERAL REHABILITATION PROGRAMS

Wastewater enters the collection system through both the public and private sectors. The wastewater utility typically owns the portion of a line that extends from the main line to the curb, and a property owner owns the portion of the line between the curb and the building foundation (more commonly known as a service lateral).

It is an industry-wide accepted premise that a majority of infiltration originates in the private property service laterals. A study conducted in 1998 in Lower Paxton Township (Dauphin County) estimated that 60 percent of that community's inflow and infiltration problems were due to defective or leaking service laterals or improper connections to the wastewater system.

For most homeowners, the problem of defective house laterals is not a concern or they may not be aware a problem actually exists. That is why it is important for ratepayers to understand that the collection and treatment of wastewater is an essential service.

Strong public support for wastewater repair or rehabilitation programs is critical to accomplishing long-term economic and environmental goals. In order to develop this support, the public must understand the financial, environmental, and community benefits resulting from the implementation of a lateral repair program. The public should be provided with information regarding the infiltration problems that have been corrected, what problems need attention, and what it will cost. Carlisle Suburban Authority (Cumberland County), for example, distributes an informational package to property owners explaining the lateral repair program in detail.

In a wastewater collection system, often there is as much or more pipe in the ground in the private sector as there is in the public sector. The municipality has little or no control over these private service laterals. The key policy issue regarding house laterals is what the public sector's role should be when private facilities could have a negative impact on the public sewer system.

It is standard practice to require property owners to pay for any repairs to their lateral. The first step municipalities can take is to mandate that repairs be made. The Town of McCandless (Allegheny County) has an ordinance that gives its sanitary authority the power to document problems when they are identified, notify the homeowner involved, and require that repairs take place.

Although some municipalities are able to require owners to repair or replace laterals, officials know that many homeowners cannot afford the cost. Most lateral repairs cost at least $3,000, and more complicated repairs can exceed $10,000. Lower Paxton Township has instituted (through a bond issue) a program of financial assistance to private homeowners. Jeannette, Pennsylvania (Westmoreland County) has also financed public assistance and has allocated up to $1,200 per property for repairs of defective laterals.

Local communities may also want to consider better inspection methods for private service laterals. Currently, there are regulations on the types of materials that should be used and how the connection should be made, but in general, the private system is not tested. Some communities require developers to air test every line that is installed. Another option would be to require an independent inspector to monitor the work site. Often the engineering firm supplies the inspector

for the project. Better inspection of service lateral installation would improve the structural integrity of the system.

The extent of a municipality's authority to expend funds for improving private property, even if the public benefit is identifiable, remains unclear. Legislation would be helpful in clarifying how municipal revenues and municipal bond issues may be used for this purpose. The use of public funds in this way should not lead to public ownership or maintenance responsibility for, or liability for the laterals. While federal and state funding may be used for public infrastructure projects, they may not be used for repairs of service laterals on private property.

Several legislative proposals are pending in the Pennsylvania General Assembly to address defective service laterals and wastewater infrastructure. Legislation has been introduced to give homeowners a state income tax credit for their repair of laterals and another to permit use of PENNVEST funds where laterals are contributing to public health problems. A third proposal would place a referendum on the statewide ballot that if approved would provide $1 billion for combined sewer overflows.