

APPENDIX

The Joint Legislative Task Force On Drinking Water Infrastructure

[Draft] Final Report

January 2018

D

R

A

F

T

D

R

[Page reserved for **transmittal letter**]

A

F

T

TASK FORCE MEMBERS

Senator Linda R. Greenstein, Co-Chair

Assemblyman John F. McKeon, Co-Chair

Senator Bob Smith

Senator Christopher “Kip” Bateman

Assemblyman Raj Mukherji

Assemblyman John DiMaio

TASK FORCE STAFF

Alison Accettola
Senate Democratic Office

Kate McDonnell
Assembly Democratic Office

Rebecca Panitch
Senate Republican Office

Thea Sheridan
Assembly Republican Office

Matt Peterson
Office of Legislative Services

TASK FORCE PROCESS

In response to concerns over the condition of the State's drinking water infrastructure, on June 30, 2016 the Legislature passed Senate Concurrent Resolution No. 86 and Assembly Concurrent Resolution No. 161, establishing the Joint Legislative Task Force on Drinking Water Infrastructure. The task force was charged with studying and making recommendations concerning issues related to drinking water infrastructure in New Jersey, and identifying both short-term and long-term solutions to address the quality and condition of drinking water infrastructure in the State.

Pursuant to these resolutions, the task force held three public hearings at the State House Annex in Trenton, New Jersey on November 30, 2016, December 14, 2016, and January 26, 2017. At the first two hearings, the task force took testimony from invited guests on the current condition of the State's drinking water infrastructure, what improvements are necessary to ensure a safe and adequate drinking water supply, and potential funding mechanisms for those improvements. At the third hearing, the task force took testimony from invited guests and members of the public on the issue of lead in drinking water. Transcripts for these hearings, including written testimony submitted by witnesses, are available on the Legislature's website.¹

During its deliberations, the task force took testimony from a wide variety of government agencies, stakeholders, and experts in the field of water infrastructure, as well as members of the public. Over two dozen witnesses testified before the task force, including representatives from the New Jersey Department of Environmental Protection (DEP), the New Jersey Environmental Infrastructure Trust (NJEIT), the New Jersey Department of Education (DOE), and the New Jersey Board of Public Utilities (BPU); investor-owned utilities, municipal utilities, and utilities authorities; nonprofit scientific and educational organizations; environmental advocacy groups; and the academic community. The input the task force received from witnesses serves as the basis for the findings and recommendations in this report.

The final report was released by a vote of [insert vote count here].

¹ Transcripts of the public hearings and accompanying written testimony may be found online at:
<http://www.njleg.state.nj.us/legislativepub/pubhearings2016.asp#TDWI>
<http://www.njleg.state.nj.us/legislativepub/pubhearings2017.asp#TDWI>

TABLE OF CONTENTS

TASK FORCE MEMBERS	ii
TASK FORCE PROCESS	iii
I. INTRODUCTION	1
II. BACKGROUND ON NEW JERSEY'S WATER SYSTEMS	4
III. FINDINGS AND RECOMMENDATIONS	6
A. COST AND FINANCING	6
B. ASSET MANAGEMENT	9
C. WATER LOSS	11
D. INVESTOR-OWNED UTILITIES	14
E. MUNICIPAL UTILITIES AND UTILITIES AUTHORITIES	15
F. AFFORDABILITY	18
G. LEAD IN DRINKING WATER	19
H. STORMWATER AND CSOs	26
I. STATEWIDE WATER SUPPLY PLAN	28
IV. CONCLUSION	30
V. APPENDIX	31

D

R

A

F

T

I. INTRODUCTION

New Jersey is facing a hidden infrastructure crisis underneath its streets in the pipes that transport its water. Much of this infrastructure has aged past its useful life and is breaking down due to decades of underinvestment. Though these pipes have been “out of sight and out of mind” for most of their existence, water utilities have warned that failure to replace them will result in an unreliable supply of safe drinking water, increased service interruptions, more frequent and costly emergency repairs, insufficient water flow and pressure, and a lack of sufficient water infrastructure to support local and State economic growth.

These are not just potential future problems; rather, cities are experiencing them right now and with increasing frequency. In Hoboken, for instance, consultants found that some of the city’s water pipes were installed in 1857, 1869, and 1897.² Since 2000, the city has experienced an average of 20 water main breaks per year and, in 2013, that number reached 30. In some instances, a pressure change caused by one main break caused additional main breaks elsewhere – known as the “ripple effect.” These water main breaks have led to road detours, water boil advisories, and inadequate water pressure for nearby residents and businesses, and posed problems for the fire department. The breaks have also lead to increased costs for the city, which is responsible for pipe replacement and capital improvements. Hoboken’s plight is shared by cities and towns across the State.

In addition, as water infrastructure ages, the amount of water that is lost to leakage rises substantially. According to Facing Our Future, the State loses an estimated 20 to 22 percent of its treated drinking water annually from leaking pipes, with some New Jersey water suppliers reporting losses of as much as 33 percent of their drinking water.³ The Natural Resources Defense Council (NRDC) estimates that New Jersey loses 130 million gallons per day of treated drinking water. Such losses raise water prices for everyone and affect the State’s ability to ensure the reliability of water for home and commercial consumption. Additionally, in an age where droughts are more common and water is scarcer, the preventable waste of this precious resource is unconscionable.

New Jersey also faces significant problems with lead, a highly toxic metal that even at low levels can impair a child’s brain development. In New Jersey, an estimated 350,000 homes and businesses are served by lead service lines, and many older buildings contain pipes, solder, and fixtures that contain lead. If water is not treated properly, or sits in pipes for too long, these lead service lines and plumbing can leach lead into

² For more information on how aging water infrastructure is impacting cities across the State, see New Jersey Future’s 2014 report entitled “Ripple Effects: The State of Water Infrastructure in New Jersey Cities and Why it Matters,” available online at: <http://www.njfuture.org/wp-content/uploads/2014/05/RIPPLE-EFFECTS-Final.pdf>.

³ For more information on the effects of aging and inadequate water infrastructure in New Jersey, see Facing Our Future’s 2013 report entitled “Infrastructure Investments Necessary for Economic Success,” available online at: <https://rucore.libraries.rutgers.edu/rutgers-lib/43476/PDF/1/play/>.

drinking water. In 2016, high concentrations of lead were found in the drinking water at 30 Newark Public School buildings. Since then, every public school in the State has been required to test its drinking water for lead, and an analysis of those test results found that lead is pervasive in the drinking water of schools across the State. The State has only just begun to assess the extent of the problem in daycare centers.

Drinking water infrastructure is only part of a much broader, interconnected network of water infrastructure, which includes wastewater and stormwater facilities and water supplies. Task force witnesses urged the task force to take a more comprehensive view of water infrastructure and to address these issues as well, using a One Water framework that views all water – drinking water, wastewater, and stormwater – as a resource that can be managed holistically and sustainably to build stronger economies, more vibrant communities, and healthy environments. The task force found that the State’s wastewater infrastructure has also aged past its useful life, lacks adequate capital investment, and poses a threat to public health and economic growth. In 21 of New Jersey’s largest and oldest cities, combined sewer systems cause raw sewage to overflow into streets and basements and contaminate waterways, including drinking water sources. In many cities, large volumes of stormwater runoff cause flooding and property damage, and carry debris, bacteria, and harmful chemicals into water bodies. The State could benefit greatly from more concrete water supply planning, especially as it relates to future projects.

The American Society of Civil Engineers (ASCE), in its 2017 “Report Card for New Jersey’s Infrastructure,” gave New Jersey a grade of “C” for drinking water infrastructure and “D” for wastewater infrastructure. In both cases, the ASCE noted, due to the age of its water systems, the State will need to overhaul much of its existing infrastructure in the next two to three decades. However, many of the State’s smaller water systems have limited revenues and so are less able to afford the necessary expertise and capital investments. Many systems face affordability concerns or are under immense pressure from elected officials and the public to reduce costs and rates, despite major deferred capital costs. This can lead to mounting costs and expensive emergency repairs, which New Jersey American Water estimates cost 10 times more to fix than routine infrastructure upgrades.

Looming over the entire water infrastructure debate is the price tag for making necessary repairs. The U.S. Environmental Protection Agency (EPA) estimates that New Jersey will require an investment of over \$40 billion over the next 20 years to meet its drinking water, wastewater, and stormwater infrastructure needs. As several witnesses noted, however, this estimate is based on documented costs, which, by their nature, cannot include what we do not know about our water system. New Jersey currently lacks a comprehensive system or report for understanding its infrastructure investment needs and, thus, actual needs may be much higher. While existing rates and potential cost-savings will meet a large portion of this funding need, industry experts anticipate a large funding gap that will require new State and federal assistance.

However, water infrastructure should not be viewed as a cost, but rather as an investment. Modern and reliable water infrastructure provides the foundation for a prosperous economy and healthy communities.⁴ It saves residents costs by creating more efficient systems and avoiding expensive emergency repairs. By contrast, failing to fix the State's water infrastructure will discourage economic development, put the health of residents at risk, and raise costs for everyone. For these reasons, states across the country, such as California, Massachusetts, and New York, are investing in their water infrastructure. They have proven that these investments are beneficial. New Jersey must now make the necessary policy changes and investments to upgrade its water infrastructure and ensure the continued health and prosperity of the State.

The task force is hopeful that the recommendations contained in this report will set New Jersey on a path to repairing and rehabilitating its broken water infrastructure. The report is not meant to be the final word, but rather the start of a broader conversation, and of follow-up action by the Legislature, the Governor, executive departments, local governments, and water utilities.

The task force recognizes the immediate need for new funding to support upgrades to aging, inadequate, and unsafe water infrastructure. It recommends that the Legislature establish a new grant program, financed by \$400 million in State general obligation bonds, to begin to address this need. Funding should be targeted strategically to incentivize local capital investments, make water systems more efficient and cost-effective, and increase transparency. Specifically, grants should be provided to systems that have complete asset management plans, for capacity building at smaller systems, and for lead service line replacement and combined sewer overflow mitigation in economically distressed communities. This will ensure that the value of each dollar spent is maximized, and that the benefits of these investments last for decades. Legislation authorizing stormwater utility fees and a wastewater system improvement charge would help raise additional needed funding.

The report also recognizes that greater information on the State's water systems is needed in order to more accurately assess the State's capital investment needs. The task force recommends that all water systems – drinking water, wastewater, and stormwater – be required to conduct asset management. As part of this requirement, water systems would be required to conduct an inventory of their water infrastructure needs and submit it to the State, to allow for the creation of an accurate Statewide comprehensive capital investment needs analysis. Other recommendations, such as required water loss audits and lead service line inventories, would provide additional needed information. The task force acknowledges that there will be implementation costs associated with these

⁴ The economic value of water infrastructure investments has been quantified by several reports. The Value of Water Campaign's report "The Economic Benefits of Investing in Water Infrastructure," finds that, for every \$1 million of capital invested in water infrastructure, 15 jobs are created. Additionally, the U.S. Bureau of Economic Analysis found that every \$1 spent on water infrastructure leverages another \$2.62 in annual economic activity. That report is available online at: http://thevalueofwater.org/sites/default/files/Economic%20Impact%20of%20Investing%20in%20Water%20Infrastructure_VOW_FINAL_pages.pdf

requirements, and has recommended that new funding be made available to facilitate them.

The task force recommends several policy changes that would protect existing sources of funding, enhance transparency, and educate decision makers at publicly-owned water systems. The task force recommends the creation of an affordability program to address rising water and sewer bills and offset any rate increases caused by new, but necessary regulatory requirements. The task force makes several recommendations for addressing the State's lead issues, particularly in schools. It recommends legislation authorizing stormwater utilities and greater incentives for green infrastructure. Finally, the task force recommends several changes to the Statewide Water Supply Plan and its enabling law to enhance water supply planning.

II. BACKGROUND ON NEW JERSEY'S WATER SYSTEMS

Ownership and management of New Jersey's water systems is highly fragmented. Unlike in many large metropolitan areas across the country, where a single regional utility manages drinking water, wastewater, and sometimes also stormwater, New Jersey's systems are owned and managed by hundreds of public and private entities. Consequently, responsibility for upgrading New Jersey's aging water infrastructure belongs to many different entities, government agencies, and individuals.

Approximately 90 percent of New Jersey residents get their water from public community water systems (i.e., systems that supply water to the same population year-round). New Jersey has approximately 580 community water systems, which are split between investor-owned utilities and publicly-owned utilities (e.g., municipal utilities and utilities authorities). Approximately 40 percent of New Jersey's population is served by only four investor-owned utilities (New Jersey American Water, SUEZ, Middlesex Water, and Aqua-NJ), which operate in 300 municipalities. Thus, the vast majority of New Jersey public community water systems are small – more than half have a design capacity of less than one million gallons per day (by comparison, New Jersey American Water's largest system has a capacity of 251 million gallons per day).

Ninety percent of New Jersey residents also rely on public wastewater systems to collect and treat their sewage. New Jersey has over 200 wastewater treatment plants, which are primarily publicly-owned. Most wastewater treatment plants in the State are small – a majority of the systems have a design capacity of less than 2.5 million gallons per day. Although municipalities and communities across the State have stormwater infrastructure, there are currently no stormwater utilities in New Jersey to manage that infrastructure. Instead, a mix of municipalities, private developments, homeowners associations, and individual property owners maintain and manage their stormwater infrastructure. As discussed in detail later in the report, there is currently no legal mechanism for the creation of stormwater utilities or fees in the State.

Regulation and oversight of the State's water systems is, likewise, highly fragmented. The New Jersey Board of Public Utilities (BPU) is primarily responsible for

regulating investor-owned utilities.⁵ The BPU has a statutory obligation to ensure that utilities under its jurisdiction provide "safe, adequate, and proper service." To that effect, the BPU can adopt regulations, issue orders, and hold public hearings regarding any aspect of service carried out by investor-owned utilities. Additionally, only investor-owned utilities are rate-regulated by the BPU. Rates are set through rate cases, a quasi-judicial process that may involve public hearings, briefs, discovery, and testimony by interested parties. Investor-owned utilities are required to provide service at rates that are "just and reasonable" and must prove that their investments are both "reasonable" and "prudent."

Publicly-owned systems, on the other hand, are not subject to BPU regulation and oversight. In the case of municipally-owned systems, the municipal governing body is responsible for setting rates, creating budgets, borrowing money, and determining the adequate level of capital investment. In the case of utilities authorities and commissions, these decisions are made by appointed bodies. In both cases, the water systems are directly responsible to the ratepayers. The Division of Local Government Services in the Department of Community Affairs approves the budgets of those municipalities that have their own water and wastewater utilities, as well as the budgets of municipal utilities authorities and sewerage authorities. However, the division has no role in, and does not review, the sufficiency of a local government's water rates, infrastructure, or capital spending.

While the Department of Environmental Protection (DEP) has a variety of water-related regulatory functions (water quality, water monitoring, water supply, etc.), it does not play any role in regulating rates or in reviewing the adequacy of infrastructure investments. That said, a number of DEP rules and regulations may affect the type of investments water systems must make in their systems and, ultimately, the rates they charge. For instance, repeated violation of the lead drinking water standard may require a system to begin replacing its lead pipes in the distribution system. Additionally, the DEP has issued permits and requirements designed to reduce or eliminate combined sewer overflows in 21 New Jersey municipalities, which will require significant investment by those municipalities. The DEP's stormwater rules establish requirements for regional and municipal stormwater management plans and stormwater control ordinances, as well as design and performance standards for stormwater management measures.

⁵ Certain municipal systems are subject to the BPU's jurisdiction for customers served outside of the municipality's limits, but only in regard to service and reliability, not rates.

III. FINDINGS AND RECOMMENDATIONS

A. COST AND FINANCING

1. Findings

The estimated cost of fixing New Jersey's water infrastructure is daunting. The U.S. Environmental Protection Agency (EPA), in its 2011 "Drinking Water Infrastructure Needs Survey and Assessment," estimated that New Jersey will require an investment of \$7.96 billion over the next 20 years in order to bring its drinking water infrastructure up to date. The EPA's "Clean Watersheds Needs Survey 2012" (CWNS) likewise estimated that the State will need \$17.48 billion over the next 20 years to update its wastewater infrastructure. This includes \$8 billion for combined sewer overflow correction and \$744 million for stormwater management. The CWNS 2012 report, notably, did not include \$17.2 billion in stormwater management needs that had been included in the CWNS 2008 report because New Jersey did not update its cost estimates as per the EPA's documentation requirements.

All told, according to the EPA, New Jersey will require over \$40 billion to meet its drinking water, wastewater, and stormwater infrastructure and treatment needs over the next 20 years. However, as several task force witnesses noted, these estimates are based on documented costs which, by their very nature, cannot include what we do not know about our water systems. As task force witness Dr. Daniel Van Abs of Rutgers University noted, "if there is a crisis in our water infrastructure, the crisis is in our lack of knowledge." Indeed, one of the key issues with water infrastructure in New Jersey is that the State currently lacks the means to assess the overall state of its infrastructure and funding needs. Consequently, the State's actual needs may be much higher. As several witnesses noted, the State could generate a more complete analysis of its needs, and a targeted plan for investments, if water systems were required to inventory and assess their assets and report their needs to the State.

It is important to note, however, that the EPA's reports do not address the extent to which existing water and sewer rates and projected cost savings from infrastructure upgrades will address the State's need. Currently, user fees (rates) provide nearly all of the funds for the operation, maintenance, and upgrade of water and sewer systems (stormwater infrastructure is not supported by user fees, but rather through local budgets). Existing water and sewer rates will likely cover a large, albeit unknown, portion of New Jersey's total water infrastructure needs. Additionally, effective asset management and infrastructure rehabilitation will yield cost savings over time through decreased water loss and fewer emergency repairs. However, witnesses agreed that existing rates and cost-savings alone will not be sufficient to address the State's large funding need.⁶

⁶ The EPA's "Clean Water and Drinking Water Gap Analysis Report," published in 2002, estimated the funding gap between projected infrastructure needs and projected infrastructure spending for the water industry nationwide. Although outdated, the analysis concluded that, for drinking water, there is a \$102 billion (\$5 billion per year) gap for capital infrastructure projects and a \$161 billion (\$8 billion per year) gap for operation and maintenance. For clean water, there is a \$122 billion (\$6 billion per year) gap for

Many water systems are too small and lack adequate revenue to finance costly water infrastructure upgrades. Other systems do not charge users for the full cost of operating, maintaining, and upgrading their systems due to affordability concerns or political pressure from ratepayers to keep rates low. In some municipalities, water systems are pressured to transfer water and sewer revenue to the municipal budget as “excess funds,” leading to deferred maintenance and upgrades. Additionally, there is currently no legal framework for the creation of stormwater utilities and stormwater fees. In many of these instances, better policy is necessary to ensure that water systems have adequate revenue to address their infrastructure needs. However, it is also clear that many systems will require additional support in the form of grants from the State or federal government to upgrade their water infrastructure.

Unfortunately, federal funding for water infrastructure falls far short of the enormous need. The federal government has provided financial assistance to water systems through the Drinking Water State Revolving Fund and the Clean Water State Revolving Fund. That financial assistance used to take the form of grants. However, in recent years, it has shifted primarily to low-interest loans. While the New Jersey Environmental Infrastructure Financing Program (NJEIFP)⁷ has been very effective at leveraging these funds to get the most use out of them, many communities do not want to participate in the loan program, or feel they cannot repay the loans. To make matters worse, the amount of federal funds available for water infrastructure has not risen to meet demands. Federal spending accounted for just four percent of all government spending on water and wastewater utilities in 2014, nationally.⁸

As nearly all of the witnesses testified, New Jersey will need to develop new funding initiatives to support upgrades to its aging water infrastructure. While the task force recognizes the State’s immediate budgetary concerns, it is also clear that the State can no longer afford to put off necessary investments in its water infrastructure. Deferring capital spending will ultimately raise costs for everyone, as expensive emergency repairs become more frequent. Without reliable and safe water and sewer services, local and State economic growth will be stunted. On the other hand, repairing and rehabilitating the State’s water infrastructure will lower long-term costs and make communities healthier and more prosperous. Task force witnesses raised a number of possible funding mechanisms – including bonding, new taxes and fees, and State appropriations – but the most feasible is a voter-approved, State general obligation bond issue.

capital infrastructure and a \$148 billion (\$7.4 billion per year) gap for operation and maintenance. New Jersey currently lacks the information necessary to assess its own funding gap.

⁷ The New Jersey Environmental Infrastructure Financing Program (NJEIFP) is a partnership between the New Jersey Department of Environmental Protection (DEP) and the New Jersey Environmental Infrastructure Trust to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water.

⁸ See the Congressional Budget Office’s 2015 report entitled “Public Spending on Transportation and Water Infrastructure, 1956 to 2014,” available online at: <http://cbo.gov/sites/default/files/114th-congress-2015-2016/reports/49910-infrastructure.pdf>

2. Recommendations

The task force recommends that the State issue \$400 million in general obligation bonds to provide new funding to support upgrades to the State's water infrastructure. Such funding would complement revenues from existing rates, which will continue to provide the majority of funds for water infrastructure. Additionally, the funding should take the form of matching grants to incentivize investment by water systems. The task force recommends that any new State funding be targeted strategically to incentivize increased local capital investments, and also make water infrastructure systems more efficient and cost-effective. In this way, the value of each dollar spent will be maximized, and the positive impacts will last for decades. The task force recommends that the State utilize the NJEIFP as the vehicle for the delivery of these funds, since it is already effectively doing this. In addition, the task force makes the following recommendations (which are discussed in greater detail throughout the report):

- **Asset Management:** The NJEIFP should offer matching grants for infrastructure upgrades to any water system that has a fully functioning asset management program. This would create an incentive for systems that are driving down long-term costs by minimizing emergency repairs, reducing waste, and supporting sound management and innovation. Grants should be structured in such a way as to reward drinking water utilities that meet the asset management requirements in the Water Quality Accountability Act (WQAA) (discussed later in this report), and to reward wastewater utilities and municipal stormwater systems that meet any forthcoming requirements for asset management. A portion of funding should be dedicated to support water audit training and validation (discussed later in this report).
- **Capacity Building:** To assist smaller and economically distressed water systems that lack the staff and funding resources to conduct proactive asset management, water loss audits, and lead service line inventories, the NJEIFP should offer grants to these systems, perhaps through its existing technical assistance program, designed to enable them to access the asset management implementation funding described above.
- **Replacing Lead Service Lines and Mitigating CSOs:** The NJEIFP should increase grant funding and other financial assistance for full lead service line replacement and the mitigation of combined sewer overflows (CSOs) in the communities that need it most: older, economically distressed communities.
- **Improving accountability and transparency:** New Jersey ratepayers need to understand how their systems are performing and whether they are getting better or worse. The State should require utilities to provide, and State agencies to collect and publish, simple standardized metrics of system condition and utility finances. Funding should be conditioned on, and support, this effort.

While the task force recognizes that \$400 million will not solve all of the State's water infrastructure issues, it is hopeful that the funds will set the State on the path to repairing and rehabilitating its broken water infrastructure. Importantly, the new funding

will support policies (described in detail in this report), such as asset management, water loss auditing, and lead service line inventories, that will generate the information New Jersey needs to comprehensively assess its water infrastructure needs and prioritize future investments. Additional recommendations in this report, such as the authorization of stormwater utilities and fees and a wastewater system improvement charge, will help water systems raise additional revenue to address infrastructure needs. Finally, the task force recommends that the Legislature and the DEP continue to advocate for greater federal funding for water infrastructure.

B. ASSET MANAGEMENT

1. Findings

Much of New Jersey's water infrastructure is rapidly approaching the end of its useful life. In order to ensure that water systems are rehabilitated and maintained effectively and that they continue to meet customer service expectations and water quality standards, utilities must conduct asset management. According to the DEP, asset management is a process to ensure that there is sufficient investment in and planned maintenance, needed repair, replacement, and upgrade of the physical components of a drinking water or wastewater system. The physical components of a system, or the "assets," include reservoirs, treatment plants, storage tanks, and pipelines.

The current best practice for conducting asset management is for a utility to develop and implement an asset management program. These programs incorporate detailed asset inventories, operation and maintenance tasks, and long-range financial planning to ensure that utilities have adequate resources to reinvest in their systems and ensure the long-term viability of those systems. The five generally recognized components of asset management planning are: (1) performing an inventory and condition assessment of the system's assets; (2) defining level of service goals (e.g., the acceptable number of service interruptions or main breaks and the acceptable amount of water loss); (3) prioritizing assets based on criticality and business risk exposure; (4) establishing life cycle costs; and (5) developing a long-term funding strategy.

There are a number of reasons why asset management is necessary. Sound planning through asset management increases the reliability of the system and protects public health and the environment, which attracts businesses and increases quality of life. From a financial standpoint, as water systems age and deteriorate, the costs of operation and maintenance increase (recall how emergency repairs cost up to 10 times more than planned infrastructure upgrades). If sufficient revenues are not reserved and the system's assets are not maintained pursuant to an asset management plan, the utility and its ratepayers may be faced with excessive costs that they cannot afford. Asset management allows a utility to plan responsibly and make prudent long-term investments in its system, which ultimately saves ratepayers money.

A number of task force witnesses identified the lack of robust asset management as one of the most significant obstacles to addressing the State's water infrastructure

issues.⁹ Recognizing this, in July 2017 New Jersey enacted the “Water Quality Accountability Act” (WQAA) (N.J.S.A.58:31-1 et seq.), which requires most drinking water systems in the State to “implement an asset management plan designed to inspect, maintain, repair, and renew its infrastructure consistent with standards established by the American Water Works Association.” The act establishes specific requirements for asset management plans and gives the DEP the authority to adopt regulations requiring additional programs, plans, or provisions. Under the act, water purveyors must provide to the department a report based on their asset management plans at least once every three years. Drinking water systems must have their plans in place by April 2019.

Task force witnesses recognized the WQAA as a critical step toward rehabilitating and modernizing the State’s aging water infrastructure. However, they also identified the limitations of the act and areas for improvement. First, because the WQAA does not specify the required elements of asset management, or the level of scrutiny the State will give to each utility’s plan, successful implementation of the law will depend on the adoption of effective regulations by the DEP. The WQAA authorizes, but does not require, regulations. Second, the DEP will need to devote sufficient staff and resources to ensuring implementation of the act and any regulations. Third, the legislation does not require public reporting, but task force witnesses urged that the public should know how their utilities are performing and whether those utilities are getting better or worse. Fourth, the law’s 150-year pipe renewal cycle will likely need to be refined to address the fact that most pipes only have an expected lifespan of 100 years or less and to address utility-specific needs; the WQAA recognized the potential need for shorter utility-specific targets. Fifth, the WQAA applies only to drinking water utilities, but the need for asset management applies equally to wastewater and stormwater infrastructure. Legislation would be needed to address this issue.

Finally, while it is recognized that asset management is always financially prudent, it requires a significant upfront investment by utilities, and some utilities will need financial assistance to meet new asset management requirements. The NJEIFP currently provides principal forgiveness loans to small drinking water systems who meet certain requirements to complete asset management. Witnesses recommended that this program be expanded, with new State funding, to provide principal forgiveness loans to more small drinking water, wastewater, and stormwater systems. Such funding will assist water systems in their own efforts to implement sound management of their infrastructure, create more efficiency, and reduce overall costs. Technical assistance from the DEP could help low-capacity utilities use the funds as well. Witnesses also agreed that increased funding will help alleviate concerns over privatization caused by more stringent regulatory requirements.

⁹ The “New Jersey Water Supply Plan 2017-2022” recognizes the critical importance of asset management in maintaining infrastructure and ensuring a safe and adequate drinking water supply. The plan is available online at: <http://www.nj.gov/dep/watersupply/pdf/wsp.pdf>

2. Recommendations

The adoption of asset management is the single most important step utilities can take to rehabilitate and maintain their water infrastructure. Therefore, the task force makes the following recommendations:

- The DEP should adopt effective regulations to implement the asset management requirements of the WQAA, including utility reporting requirements.
- The DEP should establish simple, standardized metrics for system condition and utility finances that utilities would report, and DEP would publish, to show how individual utilities are performing. These metrics should be integrated into the WQAA regulations for drinking water systems.
- The Legislature and the Governor, through the annual appropriations act, should ensure that the DEP has sufficient funds, resources, and staff to implement the WQAA and any implementing regulations effectively.
- The Legislature and the DEP should explore refining the WQAA's current pipe renewal cycle of 150 years to ensure the proper upkeep of water systems and to address system-specific needs.
- The Legislature should enact legislation, similar to the WQAA, to require asset management for wastewater and stormwater systems.
- The Legislature and the NJEIFP should establish a grant program, or expand existing programs, to assist smaller water systems and economically distressed systems in completing their asset management requirements under the WQAA and any other pertinent law or regulation and also provide technical assistance.
- The Legislature should require water systems, as part of their asset management requirements, to conduct an inventory of their infrastructure needs and submit it to the DEP, to allow for the creation of an accurate Statewide comprehensive capital investment needs analysis.

C. WATER LOSS

1. Findings

"Water loss" is the technical term for leakage from a drinking water system.¹⁰ It is most visible above ground when a water main breaks and floods a city's streets and damages homes and businesses. However, the vast majority of water loss occurs underground where old, deteriorated pipes leak millions of gallons of treated drinking water into the ground each day. In some instances, utility managers have said, a large portion of this treated drinking water also ends up in aging and cracked wastewater pipes, which are situated deeper than drinking water pipes. The drinking water then must be treated again and can contribute to overflows of raw sewage from overburdened combined sewer systems.

¹⁰ Water loss also includes "apparent loss," which is a failure to recover revenue from some of the water that is actually delivered to customers who should be paying for it, for reasons such as inaccurate meters, unauthorized consumption, and systematic errors in billing systems.

There is currently no precise data on how much water loss occurs in New Jersey. A 2013 report from Facing Our Future, based on data from several water systems, estimated that the State loses 20 to 22 percent of its treated drinking water annually from leaking pipes. The report notes that some New Jersey water suppliers have reported losses of as much as 33 percent of their treated drinking water. An audit of one municipality found that 45 percent of its treated drinking water could not be accounted for – a rate comparable to that of cities in developing countries. Most water suppliers in the State do not know how much water they are losing, what the causes are, and the associated costs because they do not perform water loss audits.

Unlike some other states, New Jersey does not have a requirement for water suppliers to assess and report on their water losses using the industry standard methodology.¹¹ However, the Delaware River Basin Commission (DRBC), an interstate agency, does have such a requirement. The Natural Resources Defense Council (NRDC) commissioned a detailed review of water loss audit reports filed by the 76 DRBC-regulated New Jersey water suppliers. According to that report, leakage among those water suppliers totaled 14 million gallons per day in 2013, which equates to a loss of about 21 gallons per customer connection per day, with many utilities losing substantially more. The data indicated that an additional two million gallons per day was going unbilled, largely through faulty measuring and billing practices. Taken together, a conservative value for these losses is \$7.5 million per year.

Extrapolating these figures over the entire State, it is estimated that New Jersey loses 130 million gallons per day of treated drinking water. According to the NRDC, over 50 million gallons per day of these water losses, conservatively valued at over \$10 million per year, are likely to be cost-effective for utilities to save. For perspective, this amount of water is equal to the total amount of water being used by 700,000 New Jersey residents, or a population two and a half times the size of Newark. Additionally, \$12.5 million per year in lost revenue is likely to be cost-effective for utilities to recover through improved water measurement and billing practices. It should be noted, however, that because the DRBC data is all self-reported, and has not been independently validated, it is likely that water losses have been underreported. New Jersey's total water losses, and associated lost revenue, are likely higher.

These conservative estimates on water loss in New Jersey suggest that water suppliers and their customers would benefit immensely from water loss audits and subsequent measures to reduce water loss. As the NRDC points out, a projected savings of \$22.5 million per year from water loss control could provide a revenue stream sufficient to raise \$350 million in bonds (assuming a 4 percent interest rate and a 25-year repayment schedule) to fund investments in water loss control. That's \$350 million that water suppliers could invest without raising water rates. However, these cost-effective investments cannot be identified without using standardized, best practice water loss audits.

¹¹ Currently, the DEP requires public water systems to submit a report on water supply and customer consumption every two years, but a standardized AWWA audit report is an option, not required.

States and regional water agencies around the country are beginning to require water suppliers to perform and report annual or biennial water loss audits. These audits use a standard methodology developed by the American Water Works Association (AWWA), which is considered the industry's best practice. Some of these states are also requiring independent validation of the self-reported audit data, and some are setting performance benchmarks to reduce losses over time. For example, Georgia and California have water loss requirements that include all of these elements, and provide technical assistance to utilities to comply with audit requirements. In 2016, Indiana adopted legislation requiring every water supplier to conduct a water loss audit using the AWWA method. According to Professor Daniel Van Abs of Rutgers University, the state achieved 100 percent compliance that same year and issued a report showing that the average water loss ranged from 19 to 24 percent among utilities. The report found that many pipes were reaching the end of their expected service lifespan. These states and the DRBC illustrate the value of a uniform water auditing approach. A number of task force witnesses recommended that the State adopt such an approach Statewide.

2. Recommendations

The task force believes that water loss audits are the first step toward achieving cost-effective reduction in water losses. Therefore, the task force makes the following recommendations:

- The Legislature should enact legislation requiring all water utilities to perform annual or biennial water loss audits, with independent validation, using the standardized AWWA methodology and report the results of those audits to the DEP. The Legislature could consider linking these requirements to the WQAA's asset management requirements, since water loss audits are one step in assessing system condition as part of an asset management plan.
- This legislation should require the department to post audit results publicly, develop performance benchmarks for utilities to reduce water loss, and provide technical assistance to utilities for both the water loss audit process and the implementation of strategies to reduce water loss.
- The legislation should require each utility to directly notify its customers of the water loss reported in the audit – for example, as part of the system's annual consumer confidence report or with the next bill customers receive after the audit has been performed.
- The Legislature and the NJEIFP should establish a program, and allocate funds, to support water audit training and validation, as other states have done.

D. INVESTOR-OWNED UTILITIES

1. Findings

New Jersey's investor-owned utilities face the same infrastructure investment needs as the rest of the State's water systems. New Jersey American Water, the State's largest water purveyor, has reported that, of the utility's 8,700 miles of pipeline in the State, over half was installed between 1870 and 1960, and fifteen percent of the pipes are between 100 and 140 years old. The utility estimates that in less than 10 years, the vast majority of these pipes will have reached, or aged beyond, their reasonably expected life.

However, unlike publicly-owned water systems, investor-owned utilities are generally better equipped to deal with the challenges of aging water infrastructure. Jersey Water Works reports that investor-owned utilities tend to charge significantly more for residential drinking water than the publicly-owned systems with similar water sources.¹² These prices reflect the actual cost of service, including capital expenditures, operations and maintenance, and the cost of capital, as well as a return on investment. Consequently, investor-owned systems typically reinvest capital dollars at much greater rates into the renewal and upgrade of their water infrastructure.

Investor-owned utilities also have the benefit of assessing a "Distribution System Improvement Charge" (DSIC). The DSIC charge, authorized by the BPU in 2012 and readopted in 2017, allows water companies to utilize a modest surcharge, separately itemized on a customer's bill, providing for contemporaneous recovery of costs on rehabilitation and replacement of aging drinking water infrastructure. The DSIC is a departure from the typical process for recovering capital costs, which requires utilities to first complete a capital project and then undertake a litigated rate base case. Under the typical rate base case, a utility does not know what portion of the cost of its capital project it will ultimately be able to recover. According to the New Jersey Utilities Association, the DSIC creates more certainty for the utilities and more of an incentive to invest in drinking water infrastructure.

Currently, however, the DSIC applies only to drinking water utilities, not sewer and wastewater utilities. Task force witnesses recommended expanding the DSIC charge to sewer and wastewater utilities to provide those utilities with a similar mechanism for funding wastewater infrastructure upgrades. Pennsylvania has already done this. Several witnesses, however, raised the concern that any new charge raises affordability concerns for customers. Thus, any authorization for a new charge should be accompanied by affordability measures (described elsewhere in this report) which mitigate the impacts to low-income residents.

¹² For more information on the obstacles impeding water system upgrades and how they can be overcome, see Jersey Water Works' 2017 report entitled "Our Water Transformed: An Action Agenda for New Jersey's Water Infrastructure," available online at: http://www.jerseywaterworks.org/wp-content/uploads/2017/11/JWW_OurWaterTransformed.pdf

2. Recommendations

The task force makes the following recommendations:

- The Legislature should work with the BPU to expand the DSIC to sewer and wastewater utilities.
- Any authorization for new charges should be accompanied by affordability measures (described elsewhere in this report) which mitigate the impacts of higher rates on low-income customers.

E. MUNICIPAL UTILITIES AND UTILITIES AUTHORITIES

1. Findings

The vast majority of New Jersey's drinking water and wastewater systems are municipal utilities and utilities authorities ("publicly-owned systems"). These systems are governed by elected and appointed officials and are, thus, directly responsible to the ratepayers of the communities they serve. Unlike the investor-owned utilities, whose rates and quality of service are regulated by the BPU, publicly-owned systems determine their own rates and quality of service. One of the major benefits of publicly-owned utilities is that they do not need to ensure a margin of profit for shareholders. They are also closer to their individual communities and have the know-how to help address emerging issues.¹³

However, publicly-owned utilities face their own set of challenges. As the American Society of Civil Engineers (ASCE) notes, because many of New Jersey's systems are small, they have limited revenues and are, thus, less able to afford the necessary expertise or management systems. Additionally, many municipal systems are under intense pressure from the public to keep costs down and rates low, despite major deferred capital costs. Consequently, the rates that many systems charge do not reflect the full cost of the service, including operations and maintenance and necessary infrastructure upgrades. Over time, this leads to increased costs and expensive emergency repairs. It should be noted that this is not the case with all publicly-owned utilities, as many are well-managed, have rates that reflect the full cost of service, and have sound long-term capital and financial plans.

However, several policy factors work against sound planning by publicly-owned utilities. Existing law, N.J.S.A.40A:5A-12.1, permits local governments to divert up to five percent of water and sewer funds for other purposes, even though those funds have been collected for the purpose of maintaining the water infrastructure. According to the Association of Environmental Authorities (AEA), in one set of 100 New Jersey municipal and authority budgets it studied, approximately \$80 million had been transferred in a three-year period. The AEA noted that some municipalities have become

¹³ For instance, the Jackson Municipal Utilities Authority partnered with their local school district to conduct lead testing at schools.

dependent on these annual diversions to supplement other parts of their budgets, to the detriment of the water systems. This is especially problematic in communities where the taxpayers and the ratepayers are not entirely the same – meaning that some ratepayers subsidize some taxpayers. Several witnesses recommended that the Legislature repeal this law. However, it was also noted that these transfers often have legitimate purposes, and removing this flexibility altogether would unfairly constrain some municipalities and preempt the judgment of locally elected leaders.

Additionally, when municipalities dissolve authorities (and take control of the water systems), large sums of money are frequently absorbed into municipal budgets and used for non-water purposes. According to the AEA, in one instance, after an authority was dissolved and its repair and replacement funds were absorbed into the municipal budget, capital spending on water plummeted. In the three years after the authority was dissolved, the community invested only \$6,000 in its drinking water system. Witnesses argued that the Legislature should amend existing law to require that municipalities dissolving water authorities and transferring funds to municipal control use authority funds solely to maintain and upgrade the water system, as those funds came from and should benefit ratepayers. Additionally, those municipalities should be required to create an asset and fiscal management plan for the system before they formally dissolve the authority. Such changes would eliminate a poor management practice that can contribute to the deterioration of water systems.

Witnesses also noted that elected and appointed officials are not being educated as well as they could be to properly maintain and upgrade water systems. These systems are among the most complex services local and county governments manage, and the technical staffs that manage them undergo extensive training and education. Witnesses argued that officials who oversee these staffs and are responsible for decision-making should, likewise, be educated about basic system operations, finance, regulation, and best management practices by way of required, first-term orientations. Such education, witnesses argued, would promote understanding, productive community dialogue, and well-informed decision-making. It is not without precedent, as appointed planning and zoning board members are currently required to take a five-hour, State-approved class on land use planning. School board members and charter school trustees are likewise required to undergo training.

Several witnesses recommended that the Legislature enact legislation requiring full-cost pricing by publicly-owned utilities. Under such a law, witnesses argue, publicly-owned systems would have adequate revenue to cover operations and maintenance costs and invest in necessary infrastructure upgrades. However, as other witnesses noted, such a law could create severe affordability concerns in some municipalities and create “rate shock,” especially in communities with large wastewater needs like the State’s 21 CSO municipalities. An alternative approach to requiring full cost-pricing is to require water systems to meet certain levels of service, as defined by regulation and through their asset management plans. This would allow local governments to map out, for themselves, how they structure rates to meet those requirements.

Finally, witnesses noted that in New Jersey many employed in the water utility sector are at or near retirement. They recommended that the State reform water and wastewater licensing to relieve staffing shortages and help fill vacancies created by the current wave of retirements.¹⁴ These reforms should streamline the State's licensing regulations to enable more young professionals to advance through the licensing categories, establish a retiree status license, and allow greater reciprocity between states.

2. Recommendations

The task force makes the following recommendations:

- The Legislature should explore legislation that would limit, or provide greater oversight over, the diversion of water and sewer funds for other purposes within a municipal budget. For instance, the legislation could limit the number of successive years these transfers can be made; narrow the acceptable conditions for a transfer to unexpected and emergency situations; or require the municipality to restore transferred funds within five or 10 years after the transfer. However, the task force does not recommend the elimination of these diversions in all circumstances. The Legislature could also explore limiting water infrastructure grant funding to communities that do not divert water funds to their general budget.
- The Legislature should enact legislation requiring municipalities dissolving water authorities and transferring funds to municipal control to use authority funds solely to maintain and upgrade the water system. The legislation should require municipalities to create an asset and fiscal management plan for the system before they formally dissolve the authority.
- The Legislature should enact legislation requiring elected and appointed officials who make decisions about water infrastructure to receive standardized education about basic system operations, finance, regulation, and best management practices in their first term.
- The Legislature should explore reforming the State's water and wastewater licensing to relieve staffing shortages at water and wastewater systems.

The task force does not recommend a measure to require full-cost pricing; rather, the State should establish, through effective asset management and water quality requirements, clearly defined levels of service and permit municipal utilities and utilities authorities to develop their own plans and rates for meeting those levels of service.

¹⁴ For instance, on December 1, 2017, NJ.com reported that Trenton's municipal water utility was severely understaffed and lacks leadership and technical expertise to provide reliable and safe water to the community. That story is available online at:
http://www.nj.com/mercer/index.ssf/2017/12/state_to_trenton_water_utility_needs_help_and_you.html

F. AFFORDABILITY

1. Findings

A major deterrent to proper investment in water infrastructure is affordability. In many New Jersey cities, 25 percent of all households are below the federal poverty line, which does not even reflect the full picture of poverty due to the State's higher cost of living. For decades, water and sewer rates have been increasing faster than the level of inflation due to increased treatment costs and the loss of federal grants. Consequently, more low-income households are having difficulty paying their water and sewer bills. Municipalities with a larger share of low-income residents find it difficult to raise rates to fund water infrastructure upgrades due to the detrimental effect higher rates will have on those residents. The result is underinvestment, which is a losing proposition since putting off infrastructure upgrades will only hurt these communities in the future when water systems fail and inevitable costs come due.

However, while increasing rates can adversely affect low-income households, as several witnesses noted, these affects are not inevitable and can be avoided with customer assistance programs. For instance, New Jersey American Water offers the Help to Others (H2O) program, which provides low-income customers with one-time grants of up to \$500 to help with water bills and avoid shutoffs. Although this program is beneficial, at present it is insufficient to meet the scale of need in the State and many households continue to fall behind in their payments. The Philadelphia Water Department recently adopted a new low-income program that reduces the water, wastewater, and stormwater bill to as low as \$15 per month for households at or below 50 percent of the federal poverty level. The program is aimed at preventing thousands of households from falling behind on their water bills. Despite the reduced cost to households, it is anticipated that the city's revenue will be greater than previously achieved because more low-income residents are paying their bills. A number of task force witnesses recommended a similar customer assistance program, or one modeled on the State's Low Income Home Energy Assistance Program.

2. Recommendations

The task force finds that any comprehensive solution to the State's water infrastructure problems must address the issue of affordability. Therefore, the task force makes the following recommendations:

- The Legislature should enact legislation establishing a customer assistance program for water and sewer bills similar to the State's low income home energy assistance program.
- The Legislature should explore legislation authorizing rate-funded customer assistance programs by utilities in their service areas.

G. LEAD IN DRINKING WATER

1. Findings

a. Background

The lead crisis in Flint, Michigan brought national attention to the issue of lead in drinking water. In 2014, a state-appointed emergency manager switched Flint's water source from Lake Huron to the highly corrosive waters of the Flint River without treatment to control the corrosion of lead pipes. Consequently, residents were exposed to toxic levels of lead – in some instances, many times greater than the federal “action level” for lead. The Flint Water Advisory Task Force, established by Michigan Governor Rick Snyder, found that the crisis was a “story of government failure, intransigence, unpreparedness, delay, inaction, and environmental injustice.” To the rest of the country, Flint presented a stark warning of the dangers of lead pipes and our aging drinking water infrastructure.

Lead is a naturally occurring metal that has been used in a wide variety of products found in and around homes, including paint, pipes and solder, gasoline, ceramics, and batteries. It is a cumulative toxicant that affects multiple body systems and is particularly harmful to young children. Even at low levels of exposure, lead can affect a child's brain development resulting in reduced intelligent quotient (IQ), behavioral changes, and reduced educational attainment. Lead exposure also causes anemia, hypertension, renal impairment, immunotoxicity, and toxicity to the reproductive organs. The neurological and behavioral effects of lead are believed to be irreversible. Consequently, experts now agree that there is no safe level of lead in the body.

Drinking water is a significant source of lead exposure. The U.S. Environmental Protection Agency estimates that 20 percent or more of human exposure to lead may come from drinking water, while formula-fed infants can receive 40 to 60 percent of their lead exposure from drinking water. New Jersey's water sources generally do not contain lead. Rather, lead enters drinking water through the water delivery infrastructure such as lead service lines or, in many older buildings, copper pipes with lead solder or plumbing fixtures that contain lead.¹⁵ Changes in water chemistry cause these materials to corrode and leach lead into drinking water. A study conducted by the EPA and the AWWA Research Foundation found that lead service lines contribute 50 to 75 percent of lead found at the tap and piping accounts for 20 to 35 percent.

Generally, water suppliers treat the drinking water with corrosion inhibitors, which reduce or eliminate the amount of lead released into water from service lines and plumbing. However, as the crisis in Flint illustrated, these measures are not foolproof, as they rely on strict monitoring, reporting, treatment, and oversight. Additionally, corrosion control measures, by themselves, are not necessarily enough to protect older

¹⁵ In 1986, Congress prohibited the use of any pipe, fitting, fixture, solder, or flux that is not “lead free” for use in any public water system or any plumbing in a residential or nonresidential facility providing water for human consumption.

homes, businesses, and schools that contain lead service lines and plumbing. Schools, in particular, are susceptible to elevated lead levels in drinking water since the water there tends to sit in, and corrode, pipes on weekends and over holiday breaks.

b. Regulation of lead in drinking water

In 1991, the U.S. Environmental Protection Agency promulgated the Lead and Copper Rule (LCR), which limits the amount of lead allowed in drinking water. Those regulations were revised in 2000 and again in 2007. The LCR requires public water systems to monitor lead from a small number of customer taps and, specifically, at homes and buildings that are at high risk of lead contamination as identified in the federal regulations. The number of taps that must be sampled depends on the size of the public water system – larger systems sample up to 100 taps, whereas smaller systems may sample as few as five. A public water system must conduct monitoring every six months, unless it qualifies for reduced monitoring, which could be annually, or triennially, depending on test results.

The LCR establishes an action level of 15 parts per billion for lead. If lead concentrations in drinking water exceed the action level in more than 10 percent of customer taps sampled, the water system must undertake corrective actions. These actions might include water quality parameter monitoring, corrosion control treatment, source water monitoring and treatment, public education (including the posting and delivery of information to customers), and, in some cases, lead service line replacement. The DEP is responsible for enforcing the LCR.

It is important to note that the purpose of the LCR is to detect and remediate system-wide lead problems (i.e., source water contamination or pipe and service line corrosion). The LCR is not intended to ensure that the water coming out of each and every customer tap is lead-free. As noted above, older homes, schools, and other buildings may have lead plumbing that contributes to high lead levels, which the public water system cannot detect or control.

Over the past several years, the DEP has taken a number of proactive steps to improve its enforcement of, and ensure system compliance with, the LCR.¹⁶ Among these actions, the DEP has:

- Created a dedicated “Lead team” to review each water system’s sampling plan, develop technical resources and guidance, respond to inquiries, and provide training to public water systems;
- Developed a website specifically for lead, which contains information for citizens, public water systems, and schools;
- Required all public community water systems to certify that their lead sampling and water quality parameter (WQP) plans are compliant with the LCR and that sampling sites are representative;

¹⁶ A full summary of these steps can be found in the department’s January 26, 2017 oral testimony before the task force and written submissions.

- Required water systems to submit their lead sampling and WQP plans, in a phased-in basis, for the DEP's in-depth review and approval;
- Required water systems to notify the DEP and any other systems to which they supply water of a change in source or treatment and, in certain cases, adjust their WQP monitoring to ensure that there are no changes in water chemistry that may affect lead leaching, such as what happened in Flint.

Additionally, in July 2016 the New Jersey Department of Education (DOE) adopted regulations requiring all schools in the State to test for lead in drinking water and report the results, and the DEP provided guidance to assist schools with this requirement. In March 2017, the New Jersey Department of Children and Families adopted regulations requiring child care centers to periodically test their drinking water for lead and report the results. Regulations are also being considered for health care facilities.

c. Extent of the problem in New Jersey

Despite State and federal regulatory efforts to limit lead in drinking water, task force witnesses agreed that it is still a major threat to public health, especially the health of children, in New Jersey. Data on children, schools, and lead service lines in homes and businesses begin to illustrate the extent of the problem.

Under New Jersey law, children under six years of age are required to be tested for lead. Children whose blood lead level exceeds 5 micrograms per deciliter (mcg/dL) are considered to have elevated blood lead levels and require responsive action by public health officials.¹⁷ According to data released by the New Jersey Department of Health, in 2016, 4,488 children in the State had blood lead levels between 5 mcg/dL and 9 mcg/dL. Of those 4,488 children, 1,864 were between the ages of six months and 26 months. Additionally, 1,024 children had a test result at or above 10 mcg/dL.¹⁸ Many more children had blood lead levels between 0 and 4 mcg/dL. Although lead exposure occurs across the State, it is most prevalent in older cities with the fewest resources to address it, creating environmental justice concerns. In 2016, the New Jersey Department of Health identified 11 cities that have a higher proportion of lead-affected children than Flint, Michigan.¹⁹

One potential source of lead exposure for children is school drinking water. In March 2016, Newark Public Schools reported elevated lead levels at 59 sampling locations across 30 school district buildings. The DEP confirmed that the lead entered the drinking water through the school's water delivery infrastructure – most likely its internal plumbing. Shortly thereafter, the DOE adopted emergency regulations to require every public school and charter school in the State to undertake periodic testing of

¹⁷ In his testimony before the task force, Dr. Bruce Ruck of the NJ Poison Information and Education System suggested that this limit will likely be lowered again in the future.

¹⁸ See the New Jersey Department of Health's 2016 report on childhood lead exposure, available online at: <http://www.state.nj.us/health/childhoodlead/documents/reports/childhoodlead2016.pdf>

¹⁹ See the NJ.com article entitled "Why 11 N.J. cities have more lead-affected kids than Flint, Michigan," available online at: http://www.nj.com/news/index.ssf/2016/02/11_cities_in_jersey_have_more_lead-affected_kids_t.html

drinking water for lead. Under the regulations, each district must make the test results available at the school facility and on the district's website. Districts must also notify parents whenever elevated lead levels are detected, and describe the steps the school is taking to immediately end use of the affected drinking water outlet. Districts were required to conduct initial testing by July 2017.

As of the date of this report, the DOE has not compiled the results of these tests.²⁰ However, in August 2017 New Jersey Future published a preliminary analysis of school lead testing data that they received through public records requests.²¹ The analysis found that lead appears to be pervasive in the drinking water of schools across New Jersey. As of August 2017, 95 districts across the State, including more than 300 schools, had at least one drinking water outlet that exhibited lead levels above the federal action level. In these 95 districts, at least 14,598 water outlets were tested, and 8.1 percent of them exceeded the action level. Furthermore, no type of community was immune from the presence of lead – as lead was present in the schools of urban, suburban, and rural communities alike.

Limitations on this data, however, make it difficult to assess the true extent of lead contamination in school drinking water. For instance, New Jersey Future discovered that numerous school districts that conducted lead testing, had positive results, and notified the public were not included in the DOE data set. The data notably did not include districts like Newark, Jersey City, and Camden, which had been conducting lead testing before the State required it. These districts previously reported elevated lead levels and, in fact, Camden has been providing bottled water to its students for 14 years due to elevated lead levels in the drinking water. New Jersey Future also noted that the type of data collected made it difficult to assess how much exposure children have had to lead at each individual school.

There is also concern that lead may exist in many childcare centers across the State – which poses one of the biggest threats because children under six are most vulnerable to the effects of lead. As noted above, the New Jersey Department of Children and Families recently announced requirements for childcare centers to test their drinking water for lead. As of the date of this report, no data has been reported or collected; however, the Legislature and the executive branch should monitor these results closely and make them public.

Children go from school or daycare to home where they may also be exposed to lead in drinking water from lead service lines and lead plumbing. The American Water Works Association estimates that, in New Jersey, 350,000 homes and businesses are served by lead service lines, fifth most in the country. However, little is known about the location of these service lines because very few water systems have completed

²⁰ New Jersey Future noted, however, that the DOE was responsive, timely, and helpful in forwarding the information as they received it from school districts. The DOE indicated that they would not be compiling the data.

²¹ <http://www.njfuture.org/wp-content/uploads/2017/08/New-Jersey-Future-Analysis-of-Testing-for-Lead-in-School-Drinking-Water-August-2017.pdf>

inventories. While some water systems are working on these inventories, none have been made available to the public. According to the most recent data the task force has obtained, only one public water system in New Jersey is currently being required to replace its lead service lines under the LCR. However, this could change as the DEP tightens its enforcement and oversight. Several other water systems have been replacing lead service lines voluntarily. In 2017, the NJEIFP made \$30 million in grants available for full lead service line replacement projects in low-income neighborhoods. While this is a good start, witnesses agreed it represents a fraction of what is needed to comprehensively address lead service lines.

Currently, one-third of New Jersey's public community water systems treat their drinking water with corrosion control chemicals to prevent lead contamination. As of December 2017, 20 of the State's 580 public community water systems and 40 of the 725 non-community water systems exceeded the federal action level for lead and have not yet returned to compliance (12 of the 40 noncompliant non-community water systems are youth facilities such as schools and child care centers that maintain their own water systems). Many more water systems are technically in compliance, because fewer than 10 percent of customer taps exceed the federal action level, but still have many residences with elevated lead levels in drinking water. The number of noncompliant figures is likely to increase in the short-term as the DEP tightens up its sampling requirements, as noted above.

d. Areas for improvement

Task force witnesses identified a number of measures the State could take to better protect the public from the dangers of lead in drinking water. For instance, several witnesses testified that the federal LCR is outdated and in need of significant revision. They cited issues with the rule's sampling, public education and notification, and corrosion control requirements; the lack of any significant remediation standards; and the inadequacy of the federal action level to protect children. They urged the DEP and EPA to work expeditiously to update the rule, and the DEP to take action alone, if necessary, to protect the public health.

Several witnesses recommended that the State require each public water system to create an inventory of its lead service lines and conduct full lead service line replacement.²² While there was broad consensus on the need for greater information on the State's lead service lines, witnesses raised several key issues with mandating lead service line replacement that were not resolved. For instance, the cost of replacing all of the State's lead service lines would be "extremely high." An EPA white paper estimated that the cost of lead service line replacement nationwide would be \$16-80 billion.²³ The issue is complicated by the fact that lead service lines are often owned by both the water

²² In 2016, California became the first (and only) state in the nation to require water systems to replace their lead service lines on a schedule. However, California also has far fewer lead service lines than New Jersey, at an estimated 65,000.

²³ That white paper is available online at: https://www.epa.gov/sites/production/files/2016-10/documents/508_lcr_revisions_white_paper_final_10.26.16.pdf

utility (up to the curb) and the homeowner (from the curb to the house). Owners would have to agree to allow water utilities onto their property to conduct full lead service line replacement, and would likely be responsible for a portion of the cost. It should also be noted that experts have warned against conducting partial lead service line replacements, as such replacements can actually exacerbate lead contamination issues.

Nonetheless, witnesses agreed that greater State and federal funding is needed to begin to address lead service lines. In 2017, the NJEIFP committed \$30 million in principal forgiveness loans for full lead service line replacement projects in low-income communities. While this is a good start, it represents only a fraction of what is needed to address lead service line replacement. Witnesses recommended that the State make funding in the form of grants or matching grants available for public water systems, residents, schools, and daycares to conduct lead service line replacement and remediate lead plumbing. Several witnesses recommended that funding be targeted at vulnerable areas such as schools and daycares and in low-income communities that are least able to afford expensive upgrades. Finally, it was suggested that the BPU allow regulated water companies to utilize the DSIC to replace lead service lines.

Although lead appears to be pervasive in school drinking water, as discussed above, the true extent of the problem is not known. Witnesses recommended that the DOE publish a Statewide assessment of lead in school drinking water that identifies the extent of the problem in each school district and the associated need for assistance. New Jersey Future's analysis of DOE data recommended that the DOE create a standardized electronic collection system for lead testing results, and require schools to submit or resubmit all of their results electronically. The group also recommended that schools be required to provide more specificity with regard to the type, location, and frequency of usage of drinking water outlets with elevated lead levels. Further, the group recommended that the DOE compile and publish Statewide data to inform State-level policy. This would aid policy makers in assessing the scope of the problem, and aid parents in knowing whether their children have had any lead exposure.

Nearly all of the witnesses recognized the need for greater funding to assist schools with severe lead issues. The State's fiscal year 2017 budget included \$10 million to reimburse schools for the cost of conducting lead testing under the DOE's regulations. According to data submitted by the DOE, this amount appears to be adequate to cover Statewide-testing costs. However, little to no State money has been made available to help schools with subsequent remediation activities such as alternative water sources, lead filters, and the repair or replacement of outlets and plumbing that contain lead. Witnesses recommended that the school funding formula factor in the need of school districts to remediate lead in drinking water. They also recommended that the DOE and the Schools Development Authority (SDA) make funding available, either through their Emergent Projects or Capital Projects programs, for lead remediation in the 31 SDA districts. Such funding is currently unavailable for that purpose.

2. Recommendations

The task force makes the following recommendations:

- The DEP should continue to work with the EPA to encourage it to expeditiously revise the LCR. The DEP should take action alone, if necessary, to amend its lead regulations, in conformance with the best available science and information, to protect the public health.
- The Legislature should enact legislation requiring each public water system to conduct a comprehensive inventory of lead service lines in use in its distribution systems, submit those inventories to the DEP, and ensure that property owners and municipal officials can access the inventories.
- The Legislature and the DEP should continue to explore the feasibility of requiring public water systems to conduct full lead service line replacement, either on a schedule or when an opportunity arises, such as during routine maintenance or repairs. The Legislature, the DEP, and the BPU should also explore ways to encourage lead service line replacement by both publicly-owned and investor-owned utilities.
- The Legislature should establish a grant program to assist public community water systems, residents, schools, and daycares in replacing their lead service lines and lead plumbing. Funding should be targeted at older, economically distressed areas where lead service lines and plumbing are more prevalent and, thus, pose the biggest threat.
- The BPU should explore allowing regulated water companies to utilize the DSIC to replace lead service lines in their service areas.
- The DOE should publish a Statewide assessment of lead in school drinking water identifying the extent of the lead problem in each school district and the associated need for assistance with remediation activities.
- The DOE should create a standardized electronic collection system and require all districts to submit or resubmit their most recent lead testing results.
- The DOE should update its lead testing regulations to require schools to identify the frequency of usage for each drinking water outlet that has an elevated lead level.
- The DOE and the SDA should allow the 31 SDA districts to obtain funding through the Emergent Projects or Capital Projects programs to conduct necessary lead remediation activities.
- The Governor and the Legislature should contemplate changes to the school funding formula to assist schools in conducting lead remediation.

H. STORMWATER AND CSOs

1. Findings

New Jersey faces an extensive set of problems due to inadequate stormwater infrastructure and management. When storms occur, rainwater runs off of impervious surfaces like roads, roofs, and parking lots into stormwater sewer systems, ditches, and waterways. This runoff carries with it debris, bacteria, and hazardous chemicals, which pollute water bodies and drinking water sources. Indeed, the EPA has recognized that stormwater runoff is the leading cause of water quality problems. Additionally, when there is no open space or stormwater management infrastructure to help absorb and capture water, runoff in large volumes and force can cause major flooding and property damage. New Jersey, in particular, is prone to pollution and flooding problems, with over 10 percent of its land area covered in impervious surfaces. These problems affect the health, safety, economic well-being, and quality of life of New Jersey residents.

Problems are particularly acute in older cities and towns with combined sewer systems (CSSs). CSSs are sewers that collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. During dry weather or light precipitation, CSSs transport all of the wastewater and limited stormwater to a sewage treatment plant, where the water is treated and discharged into a water body. However, during increased precipitation, when there is too much wastewater and stormwater to transmit, CSSs overflow, and untreated pollutants spill over into waterways in what is known as a combined sewer overflow (CSO). Twenty one New Jersey municipalities have CSSs and experience greater difficulty in handling their stormwater. Many of these systems have infrastructure that has aged well past its useful life – in some municipalities over 100 years old. The EPA has estimated that fixing CSOs in New Jersey could cost over \$8 billion.

Unlike drinking water or wastewater, stormwater is not managed by utilities dedicated for that purpose. In some instances, homeowners associations and individual property owners hold responsibility for stormwater management. However, in most cases, municipalities are responsible for managing stormwater from their Municipal Separate Storm Sewer Systems (MS4s). Operationally, local public works or sewer department staff (through cooperative service arrangements) are responsible for operating and maintaining publicly-owned stormwater infrastructure such as drainage systems and stormwater basins. In other instances, State and local government transportation agencies install and maintain stormwater infrastructure that serves roads and bridges. Despite the complex network of stormwater infrastructure, local governments often do not keep records of the location and condition of their infrastructure.

New Jersey's stormwater conveyances lack a dedicated source of funding, and receive few upgrades and little maintenance once built. Within municipal public works or sewerage departments, stormwater needs are typically given less priority and fewer staff. Often, stormwater systems go unmonitored and unattended until they break down. In some cases, the infrastructure is inadequate to manage stormwater, especially as

increased development and large storm events generate more runoff. In 2008, the EPA ranked stormwater management as New Jersey's most expensive water-related funding need, requiring \$15.6 billion. While the DEP has adopted regulations requiring municipalities to manage stormwater, many municipalities do not have the resources to do so effectively, and there is currently no explicit authority in State law for municipalities, counties, or authorities to create stormwater utilities or charge fees.

A number of task force witnesses recommended that the Legislature enact legislation authorizing local governments and authorities to establish stormwater utilities, and giving those utilities the authority to collect fees as their source of funding. Thirty nine states, including Pennsylvania, Massachusetts, and California, already have laws authorizing the creation of stormwater utilities and the imposition of fees. According to a report from Western Kentucky University, over 1,600 communities nationwide now have stormwater utilities.²⁴ Although stormwater utilities and fees differ across the country, in general, users of the stormwater system pay a fee proportionate to the burden they place on the system, and the revenue directly supports the creation, operation, and maintenance of the system. In the vast majority of cases, these fees are included on a customer's water or sewer bill, so there is no separate billing for consumers. Also, a stormwater utility fee may support stormwater management efforts within existing municipal public works or utility departments, or existing municipal utility authorities; a new government agency is not necessarily needed.

Additionally, several witnesses highlighted the importance of green infrastructure in solving the State's stormwater, wastewater, and CSO issues. Green infrastructure, which includes things like porous pavements, green roofs, rain gardens, roadside plantings, and storage containers, capture and retain rain where it falls rather than letting it flow into sewers and storm pipes (i.e., grey infrastructure). Green infrastructure is often more cost-effective than traditional grey infrastructure, and makes communities where it is installed healthier, greener, and more beautiful. The DEP has already developed guidance and a website with resources for municipalities that wish to utilize green infrastructure, and the NJEIFP has made funding available for, and given priority to, projects that utilize green infrastructure.

Finally, witnesses emphasized the One Water approach to water management, which views all water – drinking water, wastewater, and stormwater – as resources that must be managed holistically and sustainably. New Jersey would benefit from a revised vision of water resource management that looks to improve the overall, long-term benefits of all types of water resources for the State and its citizens. It is possible to combine planning for this purpose, rather than have separate planning processes and documents for each. For instance, currently, huge volumes of treated drinking water are used for landscape irrigation where drinking water quality – and the process required to achieve it – are unnecessary. Meanwhile, huge volumes of stormwater which routinely flow into overburdened sewers and CSOs could be captured and used for landscape irrigation with minimal treatment. Witnesses recommended that the State begin to

²⁴ That report, entitled "Western Kentucky University Stormwater Utility Survey 2017," is available online at: http://www.nctcog.org/envir/SEEclean/stormwater/resources/SWU_Survey_2017.pdf

integrate its water supply, wastewater, and stormwater planning efforts to reflect the One Water approach, and that the Legislature and DEP continue to explore ways to do this.

2. Recommendations

The task force makes the following recommendations:

- The Legislature should enact legislation authorizing municipalities, counties, authorities, and combinations of these entities to create stormwater utilities and permit utilities to collect a user fee to finance the creation, maintenance, and upgrade of stormwater management systems.
- The Legislature should enact legislation to require asset management for wastewater and stormwater systems (discussed earlier in the report).
- The Legislature should enact legislation encouraging and incentivizing the use of green infrastructure in stormwater and combined sewer systems. State grant programs for stormwater management should prioritize green infrastructure techniques, and the State should incorporate green infrastructure into its own facilities when possible.
- The DEP should drive and reward green infrastructure techniques in development and redevelopment projects by updating its regulations, guidance, and best management practices for stormwater.
- The New Jersey Department of Transportation should promote green infrastructure through new policies and incentives that encourage and help fund the design and construction of road projects that incorporate green stormwater infrastructure.
- The DEP should ensure that effective combined sewer overflow plans are developed and implemented, based on well-informed stakeholder input, and balance both green and grey infrastructure approaches. The NJEIFP should continue to provide, and increase, attractive financing, including principal forgiveness loans, for green and grey CSO projects. The DEP should continue to prioritize CSO communities for grant funding.
- The Legislature and the DEP should continue to explore ways in which the One Water concept of water management can be incorporated into water planning and policy, and use the One Water framework in educating the public and elected and appointed officials on the importance of our water infrastructure systems.

I. STATEWIDE WATER SUPPLY PLAN

1. Findings

Throughout the task force's hearings, witnesses urged the DEP to release the Statewide Water Supply Plan. The "Water Supply Management Act" (N.J.S.A. 58:1A-1 et seq.) requires the DEP to update the plan every five years, but prior to 2017, the plan had not had a major revision since 1996. In May 2017, the DEP released a draft Statewide Water Supply Plan. It held three public hearings on the draft plan and released

a final version in October 2017.²⁵ Though the task force did not take public testimony on the plan, witnesses submitted comments on how the plan and its enabling legislation could be improved to provide for better water supply planning in the State.

In general, the DEP's plan meets the letter of the "Water Supply Management Act" and relies on sound data and modeling. However, the plan falls short on the policy and planning side, and provides little detail or direction regarding how the State should address issues identified in the plan. For instance, the plan's recommendations for improved and additional water supply facilities, or new interconnections, give little sense of when and where these new facilities should be constructed. The report does not contain any specific recommendations for addressing current water deficits. There is also very little in the plan regarding the protection of watersheds and water supply sources. While the task force agrees that the DEP could provide more specificity with regard to water supply policy and planning, the "Water Supply Management Act" itself may need to be updated to ensure the appropriate planning occurs.

Witnesses recommended that the law be amended to include the following changes. First, future plans should include a minimum planning horizon of at least 20 years, or longer where the population data allows. Long planning horizons are necessary because it can take decades to implement major water supply projects or to significantly improve water conservation. Second, the act should require greater protection of ecologically sensitive waters, such as the Pinelands and the Highlands and fresh waters designated for non-degradation (FW1 and Category One waters). Third, the law should require specific planning for the reasonably potential impacts of temperature increases and sea level rise. Fourth, the law should require the plan to include a specific plan of action to address all existing and projected water supply deficits and threats to water supply sources. Fifth, the plan should include an evaluation of water use efficiencies and water losses (as discussed earlier in this report). Finally, a new enforcement mechanism is necessary to ensure that the plan is updated and released on its five-year schedule.

2. Recommendations

The task force makes the following recommendations:

- The DEP should update the Statewide Water Supply Plan as soon as possible to enhance the policy and planning components of the plan, as discussed above.
- The Legislature should explore updating the "Water Supply Management Act" to improve water supply planning and to ensure that the plan includes specific policy recommendations and is released in a timely fashion.

²⁵ The plan is available online at: <http://www.nj.gov/dep/watersupply/pdf/wsp.pdf>

IV. CONCLUSION

Much of New Jersey's water infrastructure has aged past its useful life and is breaking down due to decades of underinvestment. Lead service lines, combined sewer overflows, and flooding threaten the health, safety, and economic well-being of New Jersey residents. Although the cost of addressing these issues is high, the cost of delaying or taking no action is even higher, as service interruptions and costly emergency repairs become more frequent. The State must take urgent action to address its aging, inadequate, and unsafe water infrastructure. The task force is hopeful that the funding mechanisms and policy changes recommended in this report will set New Jersey on a path to doing so, thereby ensuring a brighter, healthier, and more affordable future for all New Jersey residents. The task force urges the Legislature, the Governor, local governments, and water utilities to continue to work together and with stakeholders, such as the Jersey Water Works collaborative, to discuss and implement the recommendations in this report.

D

R

A

F

T

V. APPENDIX

[Insert appendix materials, including a copy of SCR86, here]

D

R

A

F

T