Before the
Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
US House of Representatives

Testimony on the topic of
Sustainable Wastewater Infrastructure: Measures to Promote Resiliency, Climate Adaptation, and Mitigation

Presented by
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INTRODUCTION

Good morning, Chairman DeFazio, Ranking Member Graves, and the Water Resources and Environment Subcommittee members. I am Howard Neukrug, Executive Director of the Water Center at Penn. The Water Center is a nonprofit applied research arm of the University of Pennsylvania. Our primary purpose is to find solutions to the challenges facing urban and rural water systems, the watersheds that support them, and the communities that rely on them. Our work builds on the concept of integrated water systems and the values of equity, justice, and community resilience.

I have worked in the water industry for over 40 years, my first job as a staff engineer for drinking water quality and treatment at Philadelphia Water and continuing with the utility as its Director of Planning and Technical Services, the Office of Watersheds founding Director, Deputy Commissioner for Planning and Environmental Services, and finishing my career as the utility's CEO and Water Commissioner. Philadelphia Water is a municipal water, wastewater, and stormwater utility serving over two million people in the Philadelphia metropolitan area with an annual combined (capital and operating) budget of over $1 billion, 2000 employees, three

drinking water treatment facilities, three wastewater resource, and recovery facilities, and over 6000 miles of water and sewer pipes.

I have served as the Chair of the American Water Works Association (AWWA) Water Utility Council and its Technical Advisory Group, co-founded the US Water Alliance, and served on the boards of the Water Research Foundation, and the National Association of Clean Water Agencies (NACWA) boards. Each of these organizations has provided inspiration and a real learning experience for me. I mention this because I believe that our professional organizations are where you have the best opportunity to nurture new ideas and create the change that is so urgently needed for our nation's water infrastructure.

Since my retirement in 2016, in addition to founding the Water Center at Penn, I started an environmental consulting business (CASE Environmental LLC), was appointed a Professor of Water Practice at the University of Pennsylvania, and became the senior advisor of the Global Water Leader's Group and Chair of its Leading Utilities of the World CEO Network. I teach courses on "Global Water Business for the 21st Century" and "The Role of Water in Sustaining Resilient Cities."

Thank you for holding this critical hearing concerning Sustainable Wastewater Infrastructure and our efforts to promote resilient cities (and water systems) and climate adaptation and mitigation. I look forward to working with the subcommittee on its efforts to help address the growing challenges and needs brought on by a changing set of climate, economic and social realities.

THE TIME IS RIGHT FOR INVESTMENT IN WATER INFRASTRUCTURE

It is a matter no longer up for debate – America's water infrastructure systems – drinking water, wastewater, and stormwater – require significant renewal and upgrade. The American Society of Civil Engineer's (ASCE) Report Card for Water (2021) gave our nation's water systems grades of C-, D+, and D, respectively. Speaking as a professor from an Ivy League university, I can tell you that these are not good grades. These are the grades of systems that may be functional

but are highly vulnerable to partial or complete failure at any time. This has to change. If America cannot afford to provide clean and safe water to all of its citizens, what nation can?

There are many reasons why the current state of disrepair has gotten to the point it has. But the first step to recovery is simply acknowledging the problem and its root causes: deferred maintenance, inadequate revenues through tariffs, aging facilities, increased regulations, emerging contaminants, and more frequent and intense natural and anthropogenic crises.

To help us on this path toward recovery, appreciation is growing by the water utility sector and the public that yes, we should be able to swim in the water and eat the fish AND live in an adaptive, resilient, and sustainable community. Perhaps the last time this kind of public interest has occurred on a wholesale level was during the 1970s and 1980s when pollution got so bad that the Clean Waters Act (CWA) was signed into law and the US Environmental Protection Agency (EPA) was launched.

During that time, the CWA's Construction Grants Program kicked in. It changed water resource protection and management completely in the US by upgrading wastewater treatment systems. By the turn of this century, our nation's wastewater treatment facilities were successfully treating much of the gross pollution of the 1970s. But much still needs to be done.

It is important to note that this last major push to clean up our nation's waters came when the federal government supported the water sector through the provision of significant grant funding.

Today, the water sector is continuing its march toward new and innovative technologies designed to reduce costs, increase energy efficiencies, manage its existing asset base, address the next 50 plus years of a changing climate, and support sustainable and green communities. The goal? Fishable, swimmable, drinkable, accessible, attractive, safe, just, equitable, and affordable water that supports community health and sustainability, enhances economic opportunities and promotes affordable neighborhoods. But all of this requires the availability

of more funding when revenues are falling due to more and more households finding themselves unable to pay the water bill.

NEW ATTITUDES AND INNOVATION ARE CHANGING WATER RESOURCE RECOVERY

Despite the doom and gloom highlighted above concerning the state of US water infrastructure, many significant innovations are gaining traction and are at various degrees of implementation throughout the US and in the global water sector.

What is in a name? In the 1950s, they were called Sewage Treatment Plants (STPs); in the 1970s, they were Publicly Owned Treatment Works (POTWs); in the 1990s, Water Pollution Control Plants (WPCPs). Today they are being renamed as Water Resource Recovery Facilities (WRRF). Yes, they still treat sewage, are largely publicly owned, and still control pollution. But the mission has grown significantly.

For an industry that has been called the largest municipal user of electricity, more and more systems have become "Net Zero Energy" facilities. Through the availability of more energy-efficient equipment (think pumps and membranes) to strategic changes in utility operations and water and stormwater conservation, treatment facilities have been reducing electric demand for decades.

Add to this the innovations from the field of renewable energy – photovoltaic solar cells floating on reservoirs, methane gas generation, and recovery for use in cogenerating heat and electricity, and wind turbines. More and more utilities produce enough energy to manage their operations and sell the excess to nearby communities and industries.

Innovations are happening within all aspects of the treatment of what we once referred to as "waste" water; for example, the recovery and reuse of elements within the "waste" stream - phosphorous, microplastics, carbon, rare earth materials, and even the thermal heat resident within the water.

And perhaps the most significant innovation is in the recovery of the water itself. Most treatment plants in the US and worldwide treat their wastewater to a level suitable for discharge into a nearby water body. Today, water-scarce areas are treating their wastewater to a level appropriate for reuse, even to the level of direct, potable reuse.

BLUE, GREEN AND GREY INFRASTRUCTURE ADDRESS MULTIPLE CLIMATE ISSUES

This June, Philadelphia Water will hit a milestone – its 10th anniversary of the groundbreaking Green City, Clean Waters initiative. In just ten years, Philadelphia has greened previously impervious land area sufficient to prevent 3 billion gallons a year of combined sewage overflow (CSO) into its streams and rivers. This was no easy task, but the benefits of green water systems throughout a city provide additional benefits including improving public spaces, reducing urban heat island effects, reducing GHG emissions, and creating a more livable and healthier environment.

I mention blue and grey infrastructure in the section title because all forms of water management are needed to successfully protect water resources and life and property from floods, droughts, and other water disasters.

The biggest concern of the Green Infrastructure "movement" has been that while there are many, many "co-benefits" to say, planting a tree or building a rain garden, the water sector has not, to date, gotten many "co-funders" to participate in the cost-side of these projects. A big thank you to Congress and the EPA for ensuring that there is the opportunity for a set-aside in the SRF funding formula to support green infrastructure.

Increasingly, clean water utilities are becoming leaders of sustainability in their communities. I urge Congress to explore incentives and remove barriers so that other entities – electric utilities, the health care industry, and agencies that represent our roads, housing, and even litter –can work more closely with the water utilities to create co-benefits through green infrastructure. The water sector needs Congress' help in educating, incentivizing, and

leveraging these groups to increase support of multi-faceted green solutions to water and other environmental challenges.

FUNDING AND POLICY CHANGES ARE NEEDED TO MEET 21ST CENTURY WATER CHALLENGES

Clearly there is controversy over the cause of climate change, but few would argue that there has been an historic shift in weather patterns that is showing no signs of letting up. Given that, it is my hope that Congress and the federal government will continue to work with the water sector to protect life and property from the risks of flood, drought, extreme storm events, and sea level rise. Perhaps no industry is better positioned to adapt its facilities AND the communities it serves, than the water sector. But while the water sector is making a lot of progress in building resiliency and sustainability, it can *make more progress faster* with more support.

What kind of support is needed?

Undoubtedly, the current state of the water industry is unacceptable. More funding is needed, but we are near the affordability limit of many American households, the principal source for water revenues. While great strides have been made to make the water sector more efficient, more resilient, more sustainable, and more equitable, still more resources are needed for the reasons described earlier. The Clean Water SRF has been a tremendous lifeline for all parts of the water sector. Thank you. But our water challenges will only continue to increase as will the urgency to address those challenges. So, I provide you with a short list of legislative actions that would be supportive of the health of our communities and the water environment:

- Increasing the general authorization level for federal appropriations under the CW SRF program to bring the water sector closer to 21st century standards and expectations
- Supporting water utility programs that assist low-income households to maintain water service
- Supporting SRF set-asides for:
    - Rural and small communities

    - Innovative environmental projects that promote sustainability and resilience, such as Green Infrastructure
- Providing funding to eliminate or minimize two legacy infrastructure challenges in the US:
    - Combined sewer overflows
    - Lead service lines
- Increasing support for research to make water systems more efficient, resilient and sustainable

CONCLUSION – WATER CAN UNITE US

Our nation's drinking water, wastewater, and stormwater infrastructure renewal and upgrade is extensive and expensive. But the broad support for improving our nations' water infrastructure, ensuring the safety of our drinking water and keeping our waterways clean gives me hope. Please take advantage of this rare common ground by providing the necessary funding to ensure that the US can provide safe, reliable and affordable water services for every citizen. In doing so we will be able to move our nation's water infrastructure securely into the 21st century and increase our nation's resiliency and sustainability at the same time.

Thank you for Congress' continued support in funding the SRF system and I look forward to a growing partnership moving forward.

This concludes my introductory remarks. I would be pleased to answer any questions or provide additional material for the committee.