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U.S. House of Representatives
Transportation and Infrastructure
Subcommittee on Water Resources and Environment

**The Benefits of Green Infrastructure
and Low Impact Development on the
Nation's Water Quality, Economy and Communities**

Good morning, Chairwoman Johnson, Ranking Member Boozman, and members of the committee. My name is Howard Neukrug and I am Deputy Commissioner in charge of Environmental Services and Planning for the City of Philadelphia Water Department (PWD). I am honored to be here today to testify on behalf of my water utility, the City of Philadelphia and the National Association of Clean Water Agencies (NACWA), which represents the interests of municipal wastewater treatment agencies throughout the nation.

We are collectively at a time of great urgency in managing our water resources. The confluence of threats to our water supplies and the opportunities created by mandated investments means that we must invest wisely, starting now. Among leading water practitioners and researchers, the understanding of what constitutes wise investment now fully embraces green infrastructure, an approach that I look forward to sharing with you today.

Currently, however, the regulations promulgated to implement the Clean Water Act (CWA) do not recognize the essential linkage between land use, land management and water quality. The National Combined Sewer Overflow Policy (National CSO Policy) was developed at a time when little was known about the benefits of green infrastructure. Now that its benefits – to clean water, urban economies and public health – are clear, and compellingly superior to fully grey approaches, the National CSO Policy must be revised to require municipal adoption of stormwater regulations and to encourage use of green infrastructure for water management. Alternatively, Congress can amend the CWA to legislate for those modifications. Those changes could be a hallmark of a major shift in investment toward sustainable cities and an economical, holistic approach to meeting our responsibilities.

PWD attaches immense importance to its role as steward of our rivers, streams and watersheds. We seek to be a leader in sustainable water resource management and go beyond the *fishable/swimmable* goals of the Clean Water Act to additionally include, *“accessible and beautiful”* rivers and streams. Philadelphia is currently seeking state and federal regulatory approval for perhaps the nation’s most ambitious green infrastructure-based approach to meeting clean water mandates. We call our program ***Green City, Clean Waters***¹. Through implementing this \$2 billion, 25 year plan, we seek to achieve a host of environmental, social and economic benefits, while also meeting our responsibilities toward clean water. Our plan is to manage one third of the city’s impervious cover draining to our combined sewers with greened infrastructure and restore nearly 20 miles of urban stream corridor.

No, we have not taken a traditional approach to controlling combined sewer overflow – we have developed this innovative route that has required considerable watershed

¹ The City of Philadelphia’s Long Term Control Plan Update – *Green City, Clean Waters*: www.phillywatersheds.org/ltcpu

analysis and planning, triple bottom line analysis, balancing full cost of service accounting with what our citizens can afford, creation of new regulations and interagency coordination – essentially demonstrating a whole new way of doing business in Philadelphia. The City is committed to this program and the Water Department is working with other city agencies, NGOs and the business communities to ensure the program's success.

A large part of this new way of doing business has been to pilot approaches that work for our diverse communities – many of which are low income and minority. We are constantly working on finding ways of integrating capital projects on our roadways, in our schools and our recreation centers. We are using education and dialogue that work within existing patterns of life and that encourage our citizens to become long term stewards and to enjoy the benefits of their participation. It is our goal that those benefits include meaningful and sustaining jobs and a higher quality of life for all residents.

At the federal level, there are key congressional proposals that align with the work Philadelphia is modeling and that would pave the way for other cities to invest wisely. The Office of Congresswoman Donna Edwards, the National Association of Clean Water Agencies and others have worked together to develop the *Green Infrastructure for Clean Water Act of 2010*. The bill would establish important new federal tools to advance green infrastructure approaches to stormwater management. The bill would also create "Centers of Excellence" for green infrastructure that will provide critical research and information coordination services, and Philadelphia would be honored to be one of the designated centers. Additionally, the work of Congresswoman Schwartz and Congressman Blumenauer's Livable Communities Task Force in developing the Livable Communities Acts of 2009 and 2010 could help pave the way to incorporate green stormwater infrastructure into transportation, housing, and economic development projects. These integrated capital investments will encourage growth of existing communities and promote inter-agency partnerships for the sustainability of our environmental and economic resources. NACWA, its partners and I thank Congresspeople Edwards, Schwartz and Blumenauer for their leadership.

I would be thrilled to host you at any time to see the green infrastructure projects and partnerships we are cultivating in Philadelphia, so that you can see how public and private investments in green infrastructure are key to our city's regeneration. A wonderful time to come to Philadelphia would be December 6th thru 8th for the *Urban Water Sustainability Leadership Conference*. The conference, organized by the Urban Water Sustainability Council of the Clean Water America Alliance, will showcase U.S. cities that are embracing green infrastructure strategies to enhance environmental stewardship, economic development, and overall quality of life.

Indeed, just last week I spent 3 days with the mayors of Chicopee, MA, Camden, NJ, York, Pa, Torrington CT, Edison NJ, Brockton MA, Lancaster PA and Newport RI. The

event was called the Mayor's Institute of City Design and it was funded by the National Endowment of the Arts, The American Architectural Foundation and the US Conference of Mayors. Each mayor was dealing with issues of water - waterfronts, storm drainage systems, CSOs, infrastructure - and trying to understand the relation between the array of solutions to their water issues and the growth and sustainability of their city.

This is our opportunity. We are so close to realizing a new, green ethic for our cities. Getting the water dialogue - in all its forms - into this process is crucial for the success of our cities and their water supplies.

Finally, as Mayor Nutter said in DC a few short weeks ago to the Johnson Foundation gathering for *A Call to Action to Address U.S. Freshwater Challenges*,

“...we don’t have the luxury to ignore this most fundamental issue that will dramatically impact our nation’s future.”

A TIME OF GREAT OPPORTUNITY AND URGENCY

The fundamental connections between reliable and clean sources of water, economic security and opportunity, and quality of life are clear. We, at all levels of leadership, are stakeholders in ensuring high quality and abundant water supplies. And while our issues may differ in different parts of the country, we all have significant challenges ahead. We need to encourage new approaches to solving some old problems - - such as sewer overflows, our nations aging infrastructure systems, frequent droughts and floods -- while also acknowledging the new concerns of climate change and sustainability. We need to re-look at how we value our water and how we pay, as a society, for their restoration and protection. We need to do this even in these times of significant fiscal constraints.

At the same time, we must strive to put the best possible complement of regulations and policies in place – *regulations that allow us to get the utmost benefits for every investment, that ensure access to basic needs such as clean water and that promote a holistic approach to achieving multiple water related goals through strategic and integrated action*. Currently, our federal, state and municipal water regulations are not fully aligned to effect best outcomes. Given the urgency of current threats to clean water and urban sustainability, it is critical that we work together to address this issue.

CONSTRAINTS OF EXISTING REGULATIONS

Every day as I, and my colleagues in other cities, seek to achieve clean water and support 21st century sustainable cities, we are faced with the challenge to make these programs work within a 20th century interpretation of the goals of the Clean Water Act. We now recognize that green infrastructure solutions to water quality problems can achieve so much more, but are inextricably linked to other environmental, ecological and financial realities.

In Philadelphia and other cities, mayors and directors of local water utilities are working on solutions that embrace a more holistic approach to watershed management and stormwater control. This approach has been embraced by State and Federal agencies as well. Yet these approaches, while encouraged by the USEPA, are still hampered by current regulatory practices which apply standards of construction scheduling and water quality goals that still favor hard, grey, single-goal oriented infrastructure as the only solution to their regulatory environmental programs.

These legacy regulatory practices of the National Combined Sewer Overflow Policy represented a compromise among stakeholders that provided what, at the time, was regarded as the most reasonable approach to solving the nation's combined sewer overflow problems. However, recognition of the benefits to stormwater control afforded by low impact development and redevelopment techniques was not widespread at that time. As a result, the National CSO Policy was formed around the expectations that traditional, or "grey" infrastructure approaches should be the preferred approach to stormwater - and combined sewage - control. Only very recently have any of these regulatory actions recognized or attempted to incorporate the green infrastructure concepts to stormwater at its source.

Additionally, interpretation of the National CSO Policy in regulations has resulted in the expectation that violations of the water quality requirements of the CWA caused by combined sewers must be eliminated in 15-to-20 years. While not explicitly stated in the National CSO Policy, that time frame has become the de facto expectation of the Federal regulatory agencies. Clearly that time frame reflects the national experience of the time needed to plan, design and construct traditional infrastructure projects such as tanks and tunnels. That time frame does not reflect what would be needed to rebuild the stormwater drainage system of the American city using green infrastructure approaches for low impact development and redevelopment. Like it or not, the reality is that implementing a sustainable approach takes a lot of time. It took 150 years of land development and sewer construction to create the conditions that exist today. It will take 30 or 40 years to undo that damage and evolve our cities into fully sustainable green urban centers.

It is evident that much of what I discuss here is understood by and is under debate within the EPA and elsewhere within and among agencies of the Federal Government. We look forward to working with Congress and these agencies to incorporate green stormwater infrastructure into the water planning process and to evolve new, forward-looking NPDES permits for American cities. We are VERY CLOSE TO OUR GOAL!

URGING CHANGES TO OUR URBAN STORMWATER MANAGEMENT APPROACH

In 2008, the National Research Council (NRC) issued *Urban Stormwater Management in the United States*², reviewing the Phase I and Phase II stormwater programs, addressing the challenges municipalities face in managing their stormwater, and recommending options for USEPA to consider. The report cited a number of problems and inefficiencies with the stormwater program that need to be corrected in order to pave the way for any noticeable improvements our nation's waterways.

Federal laws mandating stormwater control for water quality improvements are often incomplete or conflict with state and local programs focused primarily on the flood control aspects of stormwater management. A more effective and holistic approach recommended by NRC for regulating stormwater discharges would include direct controls on land use, limits on the quantity and quality of stormwater runoff into surface waters and rigorous monitoring of adjacent waterbodies. Moreover, NRC recommends that EPA focus on green infrastructure strategies that reduce impervious surfaces and stormwater flow volume.

GREEN CITY, CLEAN WATER: PHILADELPHIA'S PLAN

Since 1997, Philadelphia has been pioneering some of the innovative approaches identified in the NRC report. PWD's Department of Environmental Services and Planning is the department charged with ensuring optimal compliance with the City's federal Clean Water Act (CWA) permit and is defining a watershed based infrastructure program that seeks to meet our responsibilities while making the most of our water investments.

As I noted before, Philadelphia is currently seeking state and federal regulatory approval for perhaps the nation's most ambitious green infrastructure-based approach to meeting clean water mandates. Our plan protects and enhances our region's waterways and overall health by managing stormwater runoff in a way that significantly reduces our reliance on underground infrastructure. We call our program **Green City, Clean Waters**. Through implementing this \$2 billion, 25 year plan, we seek to achieve a host of environmental, social and economic benefits, while also meeting our responsibilities toward clean water. Our plan is to manage the 1st inch of runoff on one third of the impervious cover within the City's combined sewer drainage area and restore nearly 20 miles of urban stream corridor.

Philadelphia has developed a watershed management-based approach that integrates land uses, waterways, infrastructure, and sustainability practices – for the protection of the city's drinking water supply, the restoration of its green spaces, and the enhancement of its wildlife habitat. Our approach includes a complementary mix of grey and green infrastructure approaches to manage stormwater. The approach

² National Research Council. *Urban Stormwater Management in the United States*. The National Academies Press, Washington, D.C., October 2008.
(http://www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf)

promotes use of tree trenches, street/sidewalk planters, bioswales, rain gardens, porous pavement, green roofs, living walls and infiltration beds on both public and private land. As these green stormwater infrastructure practices manage the first inch of rainfall that would normally flow into storm drains, they also enhance the visual, recreational and ecological assets of our community. We firmly believe that money spent on stormwater management and the attainment of CWA goals should also improve natural resources and allow us to realize a new standard of sustainable urban design.

Philadelphia's green stormwater infrastructure approaches include:

- Some of the nation's strongest stormwater regulations that require developers to manage stormwater on-site. This reduces the collective costs for managing stormwater in Philadelphia.
- A "cost of service" stormwater charge which encourages land owners to use their properties in a sustainable manner—using pervious pavement in parking lots, carving out green space on the site, or planting trees, for example—or pay for the privilege of the city collecting their rain water for them.
- Encouraging developers and property owners to use green infrastructure approaches like green roofs to meet their stormwater requirements. This guidance already has made Philadelphia # 2 in the nation's race to construct green roofs, behind our friendly rival Chicago.
- A first-in-the-nation urban in-lieu fee program to help developers identify sites for remediation as a trade-off for water takings or wetland losses due to construction activities. This encourages the re-development of our industrialized riverfront properties by expediting an often arduous process with federal agencies for wetlands protection. In addition, we have developed an evaluative tool to allow mitigation funds to be used to improve urban streams and wetlands in areas of the city often overlooked and underfunded for such activities.
- Best-in-nation regional and statewide partnerships to manage our water resources. We are working together with our up-state and out-of-state partners to limit the impact our individual plans and actions can have on the greater environment.

The innovations in Philadelphia are just a few examples of how municipalities are demonstrating leadership on this critical issue. Other NACWA member agencies across the country have also advanced environmentally sustainable programs aimed at reducing the amount of stormwater entering storm drains and overtaxing our systems.

A few examples include:

- Portland, Oregon, has created nearly 500 blocks of green streets, using vegetated curb extensions or street-side planters that collect stormwater runoff from streets, and is a leader in building eco-roofs to absorb stormwater and reduce the heat-island effect;
- In Milwaukee's GreenSeams program, more than 1,600 acres of land have been purchased along area streams and shorelines, including wetlands, that will be preserved and serve to protect water by providing the ability to store rain and melting snow;

- Chicago, St. Louis, Kansas City and others are employing the use of wetlands as storage areas for stormwater that also provide valuable habitat for migrating birds and wildlife.

These examples represent a growing trend among U.S. cities applying innovative green infrastructure approaches to address their water quality and other environmental issues.

GREENEST CITY IN AMERICA: ALIGNMENT OF LOCAL INVESTMENTS AND PRACTICES

PWD's *Green City, Clean Waters* plan has been proposed at an opportune time in Philadelphia history. Mayor Michael Nutter of Philadelphia has made it his administration's goal for Philadelphia to become the "Greenest City in America". A remarkable alignment of new policies, practices and regulations has created a fully supportive context. The city is concurrently developing a comprehensive plan, new "sustainable" zoning codes, stormwater regulations and sustainability strategies.

In April 2009, Mayor Nutter announced an innovative strategy aimed at making Philadelphia the greenest city in America. The strategy, called *Greenworks Philadelphia*³, was developed in the belief that a big city like Philadelphia, which lost population, jobs and industry in the era of cheap 20th Century energy, can reposition itself as a preferred location in this Century. Meeting federal stormwater standards is among the 15 major sustainability goals identified in Greenworks.

PROPOSED NEW INTERPRETATIONS, INITIATIVES AND LEGISLATION

It is time for the Clean Water Act to acknowledge the linkage between land use and water resource protection and to set cities on a course towards a sustainable future. If we are going to rebuild the drainage systems of America's cities, to harvest rain water, and prevent stormwater from commingling with sanitary sewage in the first place, then the CWA needs to recognize the linkage between the land and its waterways. This will require a change in the way the National CSO Policy is applied.

The efforts of NACWA, Philadelphia and other cities to promote innovative solutions and take a more holistic view of water resource management will result in significantly greater environmental benefits than current approaches allow. Cities across America are committed to spend up to their affordability limits to solve this significant pollution issue. The question then becomes how to balance a positive, proactive program to reduce sewage overflows to rivers and streams, while making the most of this opportunity to move our cities and towns forward to be more green and sustainable.

To promote the sustainable, green approach USEPA needs to revise the National CSO Control Policy to require municipalities to adopt stormwater regulations and to encourage the use of green infrastructure solutions to water management. If they

³ Greenworks Philadelphia Report: <http://www.phila.gov/green/greenworks/2009-greenworks-report.html>

don't, it is up to Congress to amend the CWA to legislate this outcome. When the CWA is reauthorized, it should not incorporate the National CSO Policy until it has been changed to allow and encourage the use of green solutions.

We believe that it is incumbent upon USEPA to develop ways to incorporate these ideas into their regulatory and enforcement framework. When cities invest in green infrastructure and other innovative, cost-saving strategies to manage their stormwater, they need to know they're going to get credit for it.

Congress should:

- Recognize that the Clean Water Act does not fully address the needs of 21st century urban waterways. A fundamental shift in how we view and manage the urban landscape is needed.
- Clarify its desire for utilities to implement watershed based, green infrastructure solutions to stormwater management. This will require the acceptance of the innovative nature of these approaches and the ability to apply adaptive management approaches to their implementation.
- Direct the USEPA to reconsider how the CSO Policy is applied to provide flexibility that will allow cities to evolve to green, sustainable urban centers. Strict overflow targets must be balanced against the impacts of other impairments. An integrated solution that uses Triple Bottom Line accounting (to balance ecology, social and financial needs) would favor solutions that address open space, habitat restoration, and other approaches that will achieve the best environmental result for the dollars spent and, ultimately, best meet the CWA.
- Recognize that stormwater control solutions can and should address more than a simple reduction in intermittent pollutant loads, but can be structured to improve the triple bottom line i.e., air quality, aquatic habitat, human health and the urban living environment.
- Support spending for research to measure the effectiveness of non-traditional techniques and to fund implementation effective stormwater control program as called for in the NRC report in cash-strapped communities.

In 2007, NACWA, USEPA, the Natural Resources Defense Council (NRDC), American Rivers, and the Low-Impact Development Center signed a ***Statement of Intent on Green Infrastructure***, which calls for a collaborative effort among the signatory organizations in order to promote the benefits of using green infrastructure; outlines a number of steps to be taken in this regard such as development of models for all components of green infrastructure; and explores regulatory incentives for the use of green infrastructure. The ***Statement*** provides an excellent reference for future tools.

The Office of Congresswoman Donna Edwards, the National Association of Clean Water Agencies, American Rivers, the Natural Resources Defense Council have worked together to develop the *Green Infrastructure for Clean Water Act of 2010*. The bill would establish important new federal tools to advance green infrastructure approaches to stormwater management. Specifically, the legislation would establish 3-5

Centers for Excellence to undertake research, serve as information clearinghouses on best management practices, and provide technical assistance to communities interested in implementing green infrastructure techniques. The legislation would also provide small amounts of incentive funding for community demonstration projects, and require EPA to explore how to better integrate green infrastructure approaches into enforcement actions. All members of this subcommittee are encouraged to join this legislation as co-sponsors if you have not already done so.

Additionally, the work of Congresswoman Schwartz and Congressman Blumenauer's Livable Communities Task Force in developing the Livable Communities Acts of 2009 and 2010 could help pave the way to incorporation of green stormwater infrastructure in to capital project planning for a number of agencies. The Livable Communities Acts of 2009 and 2010 seek to provide affordable, energy-efficient, and location-efficient housing choices for people of all ages, incomes, races, and ethnicities; supports, revitalizes, and encourages the growth of existing communities and maximizes the cost effectiveness of existing infrastructure; promotes economic development and economic competitiveness; and preserves the environment and natural resources.

All these initiatives provide encouragement that our approach is the right one, and that the time is right to make green infrastructure approaches to stormwater and CSO control the preferred solution to water quality impairment.

AN INVITATION

In closing, thank you for inviting me here today. I look forward to working with all of you to create a more sustainable America. I hope you can come visit us and see some of the work we are doing throughout city government to make this vision a reality.

NACWA's Clean Water America Alliance (Alliance), of which I am a board member and Chair of the Alliance's Urban Water Sustainability Council, will be holding an important leadership conference in Philadelphia in December. The *Urban Water Sustainability Leadership Conference* will be held December 6th thru 8th at the University of Pennsylvania. It will showcase U.S. cities that are embracing green infrastructure strategies as a way of improving environmental stewardship, economic development, and the overall quality of life for their residents. I hope you will be able to join us. If you are not, I will make sure the conference proceedings will be available for your review.

The opportunities and the benefits of green stormwater programs are too great for us to fail to act. Your help to frame policy and enforcement strategies that meet the goals of the CWA while promoting green and sustainable cities is needed. Madam Chair, I look forward to working with you and the other members of Congress to accomplish these important goals.