

# Stormwater Management for CSOs via Private Development Regulations, Ordinances, and Rates

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# The Burning Questions

- How did you do it ?
- What did you do ?
- How is it working ?
- What are your lessons learned ?
- What's your advice to those looking to do something similar ?
- What would you change ?

# How Did You Do It?

## Factors for Success

- Know your regs & ordinances
- Find a driver or series of drivers to leverage
- Know the political and public landscape and have a team to help maneuver it
- Be willing to compromise and offer something in return
- Be willing to take some shots and weather the storm of initial reaction
- Provide political cover
- Know the impacted parties and create dialogues in advance

# Drivers/Levers/Opportunities

- Act 167 funding related to development
- Act 537 planning development caps
- MS4 permit
- TMDL
- NPDES permit
- CSO consent order
- LEED
- Flooding
- Cost of meeting all these on public side vs. cost of doing some in private side = billions \$\$\$\$

# The Philadelphia Strategy

- Long term
  - Create a framework for stormwater currency on private lands
- Short term
  - Have development manage stormwater better
  - Have stormwater rates fairly allocated to have large impervious areas pay their fair share

# What did you do ?

- Leveraged existing ordinance from 1996 by promulgating regulations
- Coordinated with all City agencies and development community for 2 years in advance
- Moved water from last thing to first thing in development process
- Developed economic, public, and political messages
- Changed our stormwater billing approach

# PWD Stormwater Management Regulations

## Water Quality

### ❖ **Infiltration of the first inch of runoff from all directly connected impervious area (DCIA)**

- Volume reduction
- Recharge groundwater table
- Mimic natural hydrology
- Reduce pollution in runoff

### ❖ **When infiltration is not feasible**

- Combined Sewershed: Volume reduction, control discharge rate
- Separate Sewershed: Volume reduction, increased quality



*Rain Garden: Volume Reduction, Increased Quality*

# PWD Stormwater Management Regulations

## Flood Control

- **Control the rate in which the site releases stormwater**
  - Reduce or prevent flooding
  - Prevent pipe backups
  - Utilize existing infrastructure
- **Reduce post-development runoff peaks to pre-development conditions**

## Channel Protection

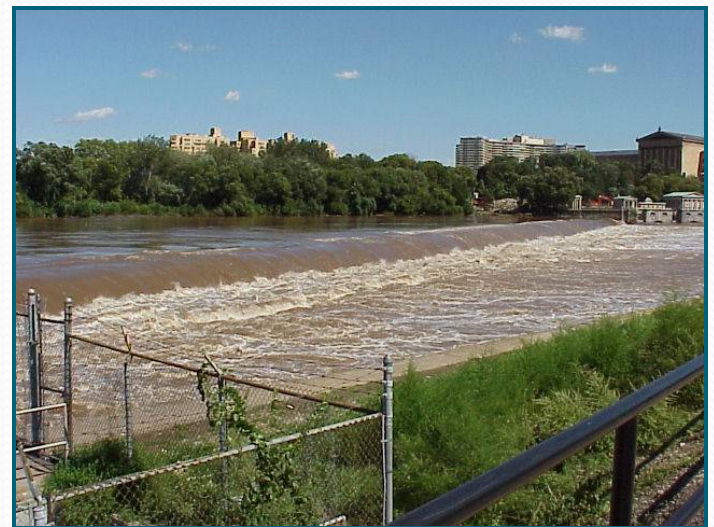
- **Slow release of the 1-year, 24-hour storm event**
  - Protect quality of stream channels and banks
- **Detain and release runoff at a specified rate**



# PWD Stormwater Management Regulations

## Erosion & Sedimentation (E & S) Control

- Prevent runoff carrying sediment, trash, and other pollutants from obstructing infrastructure and impairing waterways and aquatic life
- Review and enforce E & S in accordance with PADEP Manual
- Coordinate with PADEP as part of NPDES permit review





# PWD Stormwater Management Regulations

- 481 development projects approved
- 1,100 acres of planned management.
- >547 acres constructed = >519 MG/yr runoff reduction
- Saved PWD > \$57 million in capital.

	Planned Acres	Constructed Acres	Sites
Green Roof	16	5	68
Porous Pavement	15	39	117



*Drexel University Millennium Hall*

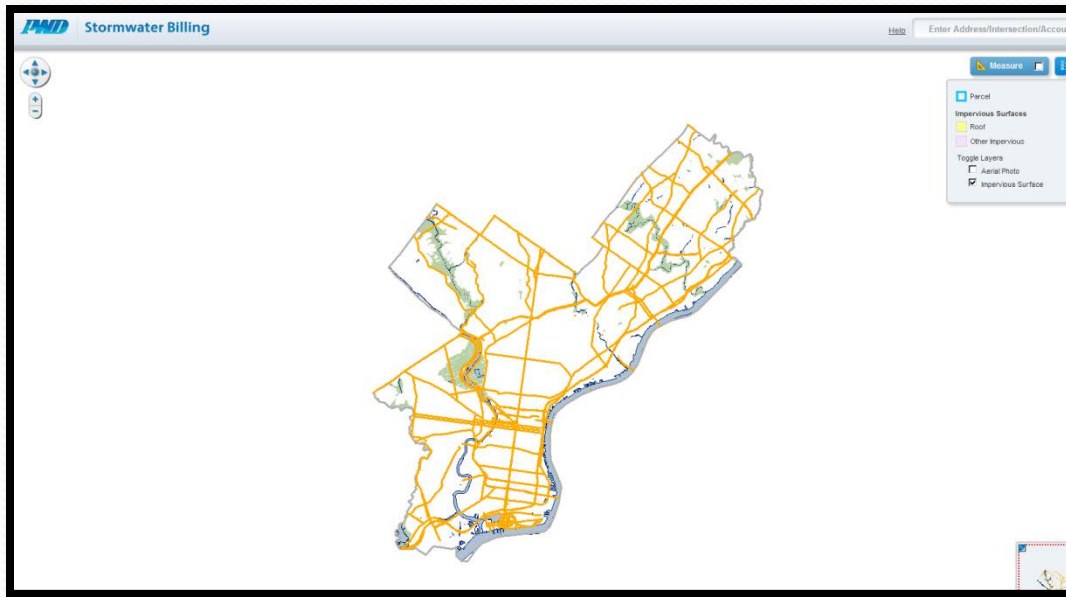


*The Radian, 40<sup>th</sup> and Walnut Streets*

# Development Review Process

- **PWD Conceptual Plan Approval is a required prerequisite to obtain Licenses and Inspections (L & I) Zoning Permit.**
- **PWD Technical Stormwater Management Plan Approval is a required prerequisite to obtain L & I Building Permit.**
- **During construction activity, PWD inspectors visit site to ensure compliance.**
  - With the support of L & I, PWD will issue violations to non-compliant sites.
- **Record Drawings, indicating the as-built condition of the site, are submitted to PWD at the conclusion of construction.**

# Stormwater Parcel-Based Billing



- Began July 1, 2010
- Driven by customer equity
- Accompanying credits program – customers can receive up to 100% discount

# Changing how PWD Charges for Stormwater Management

- PWD began charging customers for stormwater service in the late 1960s
- Traditional method: Costs based on size of the water meter
  - 40,000 stormwater customers not billed because they didn't have a water meter
- PWD convened a Citizens Advisory Council (CAC) in 1996 to receive guidance on equitable stormwater billing methods

# Recommendations of the Stormwater Reallocation CAC

- Charge based on a property's total size (gross area) and amount of impervious area
- Every property pays a stormwater fee
- Revenue neutral
- Fair cost of service
- Encourage BMP retrofits through a credits program

**Stormwater parcel-based billing went live in July 2010  
– with a 4 year phase-in**



# Current Stormwater Rates

## Meter-Based Rates

- 5/8 inch meter \$11.06
- 3/4 inch meter \$72.12
- 1 inch meter \$120.20
- 1-1/2 inch meter \$240.39
- 2 inch meter \$384.62
- 3 inch meter \$721.15
- 4 inch meter \$1,201.92
- 6 inch meter \$2,403.83
- 8 inch meter \$3,846.14
- 10 inch meter \$5,528.80
- 12 inch meter \$10,336.50

## Parcel-Based Rates

- Gross Area (GA) is \$0.528/mo per 500 square feet
- Impervious Area (IA) is \$4.169/mo per 500 square feet

Map Tools

Measure
Identify Parcel

2201-39 FAIRMOUNT AVE

SPEN ST  
PEROT ST  
OLIVE ST

▼ Parcel Info

BRT Account	772668300
Address	2201-39 FAIRMOUNT AVE
Owner	SPRING GARDEN COMMUNITY DEVELOPMENT CORP
Property Type	Non-Residential
Gross Area	101,548 ft <sup>2</sup>
Impervious Area	84,606 ft <sup>2</sup>
More Details...	<a href="#">Click Here</a>

▼ Account #053-33280-02201-001

Account	053-33280-02201-001
Account Holder	SPRING GARDEN COMM DEVEL
Address	2201 FAIRMOUNT AVE
Service Type	5 - Water Only
Meter Size	R - 5/8"





## 1101-11 MARKET ST

### Basic Parcel Details

Owner GIRARD ESTATE FEE  
 Property Type Non-Residential  
 OPA/BRT Account(s) 883308700  
 Gross Area 39,800 ft<sup>2</sup>  
 Impervious Area 39,698 ft<sup>2</sup>  
 Credit Application Form [Get Application Form](#)  
 Appeal Application Form [Get Application Form](#)

[Download Details as PDF](#)



Please Note: The data on this site is to be used for stormwater billing purposes only. The Records Department's Mapping Unit maintains parcel maps. These maps contain the graphical depiction of the legal descriptions contained on deeds that are also processed by Records. The Streets Department's Survey Unit maintains maps that contain survey data and street plans.

### Charge Summary

This summary shows monthly stormwater charges phased in during FY 2011 to FY 2014 as the charge transitions from completely meter-based (FY 2010) to completely parcel area-based (FY 2014).

Fiscal Year:	July 1, 2009 to June 30, 2010	July 1, 2010 to June 30, 2011	July 1, 2011 to June 30, 2012	July 1, 2012 to June 30, 2013	July 1, 2013 to June 30, 2014
▶ <a href="#">Account # 011-53560-01101-001</a>	\$682.35	\$578.34	\$458.45	\$324.49	\$190.53
▶ <a href="#">Account # 011-53560-01101-002</a>	\$682.35	\$578.34	\$458.45	\$324.49	\$190.53
<b>Total Stormwater (SWMC) Charge</b>	<b>\$1,364.70</b>	<b>\$1,156.67</b>	<b>\$916.89</b>	<b>\$648.98</b>	<b>\$381.06</b>

## 2201-39 FAIRMOUNT AVE

### Basic Parcel Details

**Owner** SPRING GARDEN COMMUNITY  
**Property Type** Non-Residential  
**OPA/BRT Account(s)** 772668300  
**Gross Area** 101,548 ft<sup>2</sup>  
**Impervious Area** 84,606 ft<sup>2</sup>  
**Credit Application Form** [Get Application Form](#)  
**Appeal Application Form** [Get Application Form](#)

[Download Details as PDF](#)


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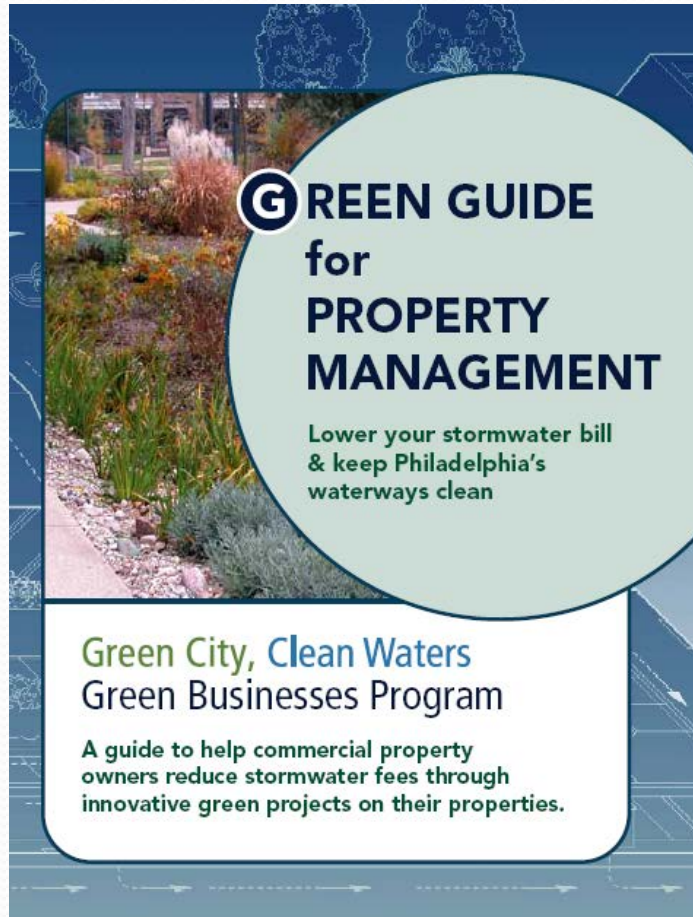
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► <a href="#">Account # 053-33280-02201-001</a>		\$0.00	\$203.62	\$409.55	\$614.32	\$819.09
<b>Total Stormwater (SWMC) Charge</b>		<b>\$0.00</b>	<b>\$203.62</b>	<b>\$409.55</b>	<b>\$614.32</b>	<b>\$819.09</b>



# Stormwater Credits



- Impervious Area Credit – management of the first inch of runoff, same requirement in Stormwater Regulations
- Gross Area Credit – eligible to properties with a lot of green/open space
- NPDES Industrial Permit Credit – eligible to properties that maintain a permit with the PA DEP for stormwater discharge

# Impervious Area Credit

- Management of the first 1" = fee credit = greened acre
- PWD needs 12,000 greened acres in combined sewer area
- 8,000 acres of non-residential impervious area available

How can we leverage private investment in green infrastructure retrofits?



# Next on the horizon

Coming attractions.....

# Leveraging Private Financing

- Similar to energy efficiency financing models
- Third-party off-balance sheet financing
- Government policies to facilitate third-party financing:
  - Credit enhancement
  - On-bill collection
  - Tax-lien financing
- Off-site mitigation

**Many parties are engaging with PWD to explore alternative financing models**

# Current PWD Assistance & Incentive Programs

- Stormwater Assistance Phase-in Program (SWAPP)
  - effective 10% cap on stormwater charge increases
    - Customer must see fiscal year increase greater than 10% and \$100 and must be current in all city taxes and bills
    - 1700 eligible accounts, ~350 approved applications
- Stormwater Management Incentives Program (SMIP)
  - \$5 million in grant monies available





## Stormwater Management Incentive Program Grant



### BACKGROUND

The City of Philadelphia, through the Philadelphia Water Department (PWD), and the Philadelphia Industrial Development Corporation (PIDC) created the Stormwater Management Incentive Program Grant (SMIP) to provide assistance to non-residential PWD customers. This program offers grant funding to stimulate investment in and utilization of stormwater best management practices which reduce a parcel's contribution of stormwater to the City's system.

### USES

Use of funds is restricted to grants which support the design and construction of stormwater mitigation measures. These may include, but are not limited to: detention and retention basins, tree trenches, green roofs, porous paving, and rain gardens.



Tree Trench



Porous Pavement



Green Roof



Rain Garden

### ELIGIBILITY

Only non-residential properties are eligible for SMIP grant funds. Applicants must be owners of the property or have permission from the property owner(s). The applicant cannot be an agency with the City of Philadelphia, the Commonwealth of Pennsylvania or any United States Department or Federal Agency.

### GRANT EVALUATION & REQUIREMENTS

Projects will be evaluated based on a variety of criteria, including, but not limited to, the total volume of runoff managed, the expected benefits of the project, and the ability of the grantee to leverage other funding sources. Capture of the first inch of runoff from the property that would otherwise be discharged to the City system is required. All funded projects will be required to file a deed restriction in the form of an Access, Operations, and Maintenance Agreement with the property.

### PROCESS

A Selection Committee comprised of PWD staff will evaluate applications. Applications must be submitted electronically by March 31, 2012. Applicants will be notified by July 1, 2012 if their applications have been accepted. Grantees will be eligible to receive credits on their stormwater bills upon successful construction of the green stormwater infrastructure. Some projects may receive partial grant funding supplemented by low interest loans.

For more information about the SMIP Grant please go to [www.phillywatersheds.org/what\\_were\\_doing/SMIP\\_Grant](http://www.phillywatersheds.org/what_were_doing/SMIP_Grant).

To apply for the SMIP Grant please go to [www.pidc-pa.org/development-and-contract-opportunities/rfp-rfq-opportunities](http://www.pidc-pa.org/development-and-contract-opportunities/rfp-rfq-opportunities).

For questions about the grant, please contact Jennifer Crowther at (215) 496-8139 or [jcrowther@pidc-pa.org](mailto:jcrowther@pidc-pa.org).

For technical questions, please contact Erin Williams at [Erin.Williams@phila.gov](mailto:Erin.Williams@phila.gov).

# Stormwater Management Incentives Program



# SMIP Background

- ❖ Offer incentives and assistance to non-residential PWD customers impacted by the change in PWD stormwater regulations and fees
- ❖ Stimulate investment in and utilization of stormwater best management practices

## SMIP Eligibility

- ❖ Non-residential Philadelphia-based property owners that implement stormwater management practices and reduce a parcel's contribution of stormwater
- ❖ Applicants must be current in their PWD water, sewer, and stormwater accounts
- ❖ All City taxes must be paid

# SMIP Selection Process

- ❖ A PWD Selection Committee will evaluate applications based on the technical merit of the stormwater management practice and a variety of other factors – cost-efficiency!
- ❖ 1<sup>st</sup> Round closed March 31<sup>st</sup>
  - ❖ 48 applications received, \$25 million in requests
  - ❖ 8 applications awarded, totaling \$3.3 million
- ❖ 2<sup>nd</sup> Round anticipated Fall 2012

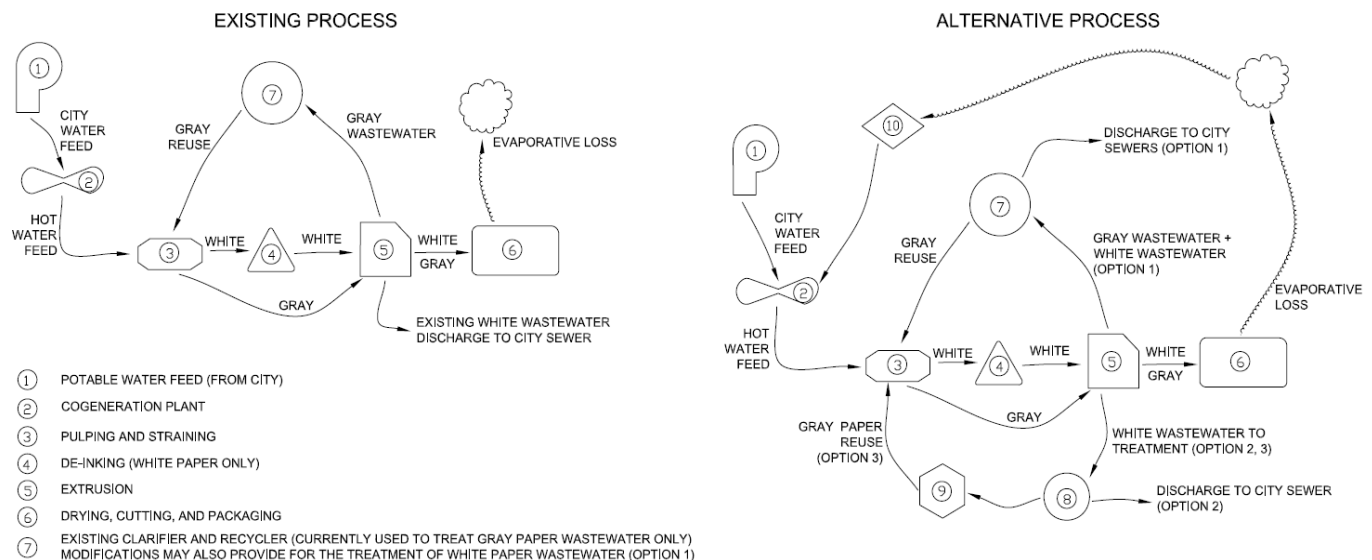
# SMIP Project Example

## Newman Paper Company

- Proposed rainwater harvesting systems could result save \$2,600/month in stormwater fees and \$1,800 in water usage charges

- 7.25 greened acres

FIGURE 2. NEWMAN PAPER PROCESS SCHEMATIC



# The IMPACT Beyond Stormwater

And 3 to 6 years later in our communities after PWD implemented stormwater regulations and parcel based billing the benefits are more than stormwater.....

# Salvation Army – Kroc Corps Community Center

- Project Type: Community center
- Project Status: Complete
- Project Location: 4200 Wissahickon Ave in Hunting Park, separate sewer, Schuylkill River watershed
- Project Size: 12.4-acre Brownfield redevelopment site
- Regulations: Water Quality; Flood Control exempt due to reduction in impervious area
- SMPs:
  - +/- 78,000 sq. ft. of porous pavement
  - Multiple robustly-planted bioretention basins connected in series
  - Cisterns to capture and store rainwater for site irrigation and for use in aesthetic water features on site



Image via planphilly.com



Image via salvationarmy.org

# Kensington Creative and Performing Arts (CAPA) School

- Project Type: School
- Project Status: Complete
- Project Location: 1751 N. Front St. in Kensington, CSO, Delaware River watershed
- Project Size: 7.8-acre redevelopment site
- Regulations: Water Quality, Flood Control, PHS rate
- SMPs:
  - 22,000 sq. ft. of green roof
  - 13, 500 sq. ft. of porous pavement with two subsurface infiltration basins.
  - Two slow-release, subsurface detention basins in series with porous pavement topped infiltration basins.
  - Large rain garden with subsurface storage modules





Image via aia.org | photo credit: Barry Halkin, Halkin Photography



# Transit Oriented Design / Affordable Housing

- Project Type: Mixed Use / Residential
- Project Status: Active Construction
- Project Location: 9<sup>th</sup> and Berks Streets in North Philly near Temple University, CSO, Delaware River
- Project Size: 2.5-acre Brownfield redevelopment site
- Regulations: Water Quality, Flood Control, PHS rate
- SMPs:
  - Two subsurface infiltration basins below a subsurface parking garage.
  - Buildings proposed on top of subsurface parking garage. Landscaping area around buildings is an “intensive / extensive” green roof.
  - 1,200 sq. ft. of porous pavement hardscape areas around buildings.
  - Blue roofs atop proposed buildings.

# Xfinity Live!

- Project Type: Commercial Sports Bar / Entertainment
- Project Status: Complete
- Project Location: Broad St. and Pattison Avenue among professional sports venues in South Philly, CSO, Delaware River watershed
- Project Size: 4.9-acre redevelopment site
- Regulations: Water Quality, Flood Control
- SMPs:
  - Two bioretention areas
  - One subsurface detention basin
  - One bioretention area is a highly visible SMP within an outdoor gathering space



Image via [215sports.wordpress.com](http://215sports.wordpress.com)



Image via [centercityteam.com](http://centercityteam.com)

# Sister Cities Park

- Project Type: Park
- Project Status: Complete
- Project Location: 18<sup>th</sup> Street and Ben Franklin Parkway in Center City, CSO area, Delaware River watershed
- Project Size: 1.3-acre redevelopment site
- Regulations: Water Quality, Flood Control Flood Control exempt due to reduction in impervious area from existing conditions
- SMPs:
  - “Disconnected” impervious areas including walkways, plaza, and playground area. Runoff from paved areas drains into green spaces.
  - Café / Community Center building with green roof
  - One slow-release, subsurface detention basin to further reduce peak runoff rates





Image via uwishunu.com



Image via centercityphila.org



Image via centercityphila.org

# PA Liquor Control Board Distribution Facility

- Project Type: Industrial / large commercial / warehouse
- Project Status: Design
- Project Location: 3rd St. and Packer Ave. in South Philly, CSO area, Delaware River watershed
- Project Size: +/- 445,000 sq. ft. (10.2 ac.) building footprint on a 24.3-acre redevelopment site
- Regulations: Water Quality, Flood Control
- SMPs:
  - Large green roof – currently proposed 187,540 sq. ft. (4.3 ac.). If approved and constructed as proposed, may be among a handful of the biggest “extensive” green roofs in the world.
  - Four large, slow release detention basins beneath parking / loading areas to further reduce peak runoff rates.

# Conclusions

Take home messages

# Conclusions

- Managing stormwater on private lands is >40% of PWD's CSO compliance
- Leverages the equivalent of another \$1.2 billion in CSO management for rate payers that they can't afford.
- Achieves more than stormwater in terms of community improvements/impacts
- Creates new industries and jobs
- If Philadelphia can do it why can't other cities ?