



# **Bronx River Combined Sewer Overflow Long Term Control Plan**

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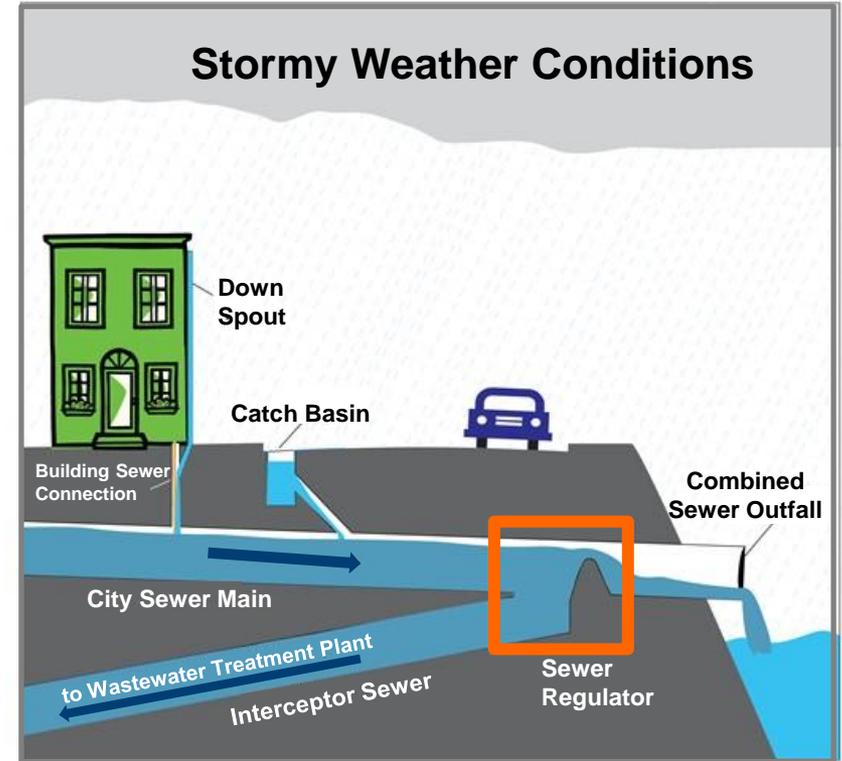
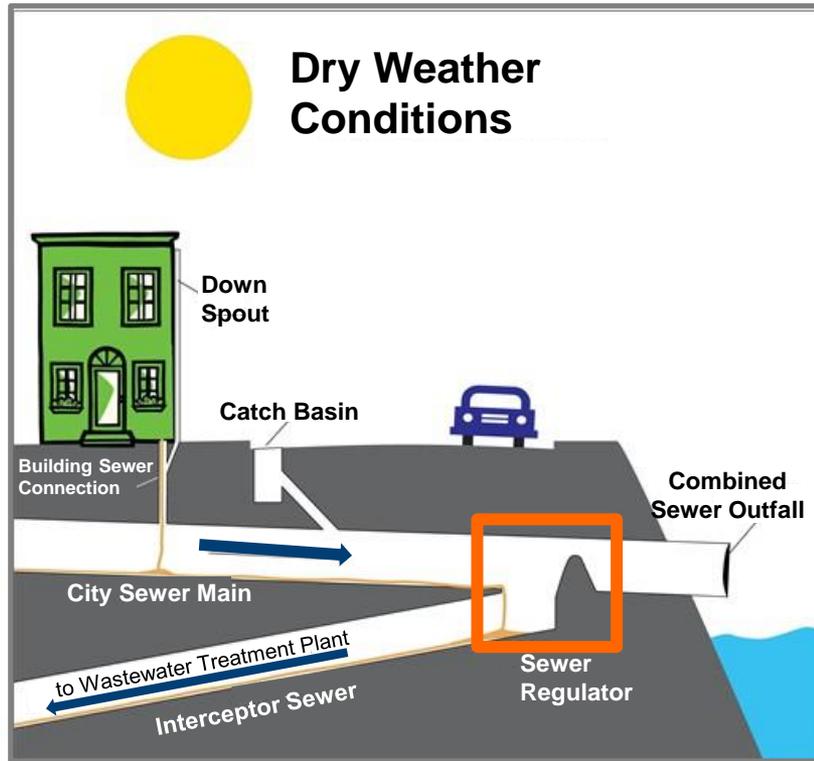
Public Kickoff Meeting  
Casita Maria, Bronx, NY  
February 12, 2015

# Welcome & Introductions

Eric Landau  
Associate Commissioner  
DEP

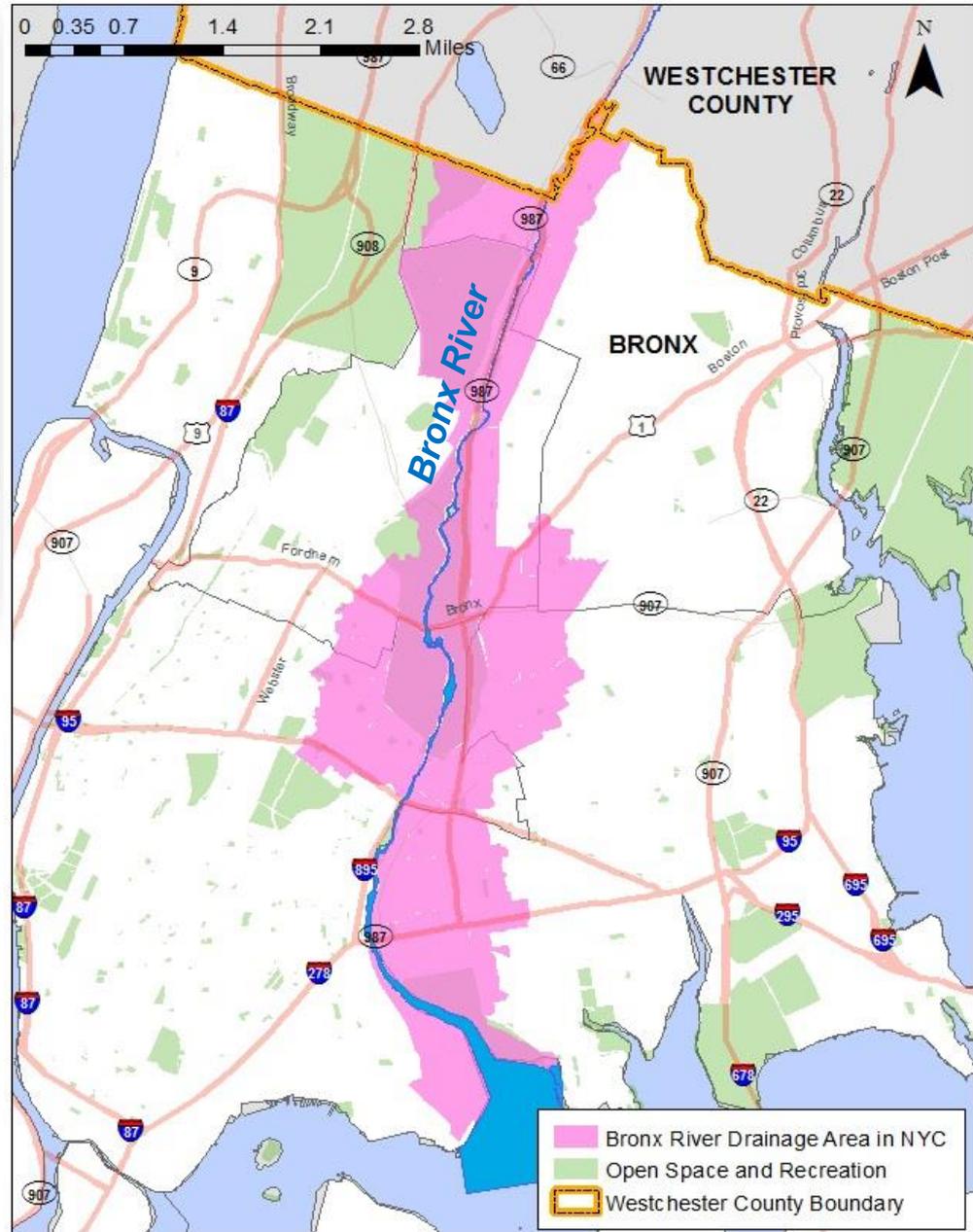
# What is a Combined Sewer Overflow?

- NYC's sewer system is approximately 60% **combined**, which means it is used to **convey both sanitary and storm flows**.



- When the sewer system is at full capacity, a diluted mixture of rain water and sewage can be released into local waterways. This is called a combined sewer overflow (CSO).
- 65% to 90% CSOs are fully captured at treatment plants.

# Bronx River Watershed



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## Long Term Control Plan (LTCP)

**identifies appropriate CSO controls to achieve  
applicable water quality standards**

consistent with the Federal CSO Policy and Clean Water Act

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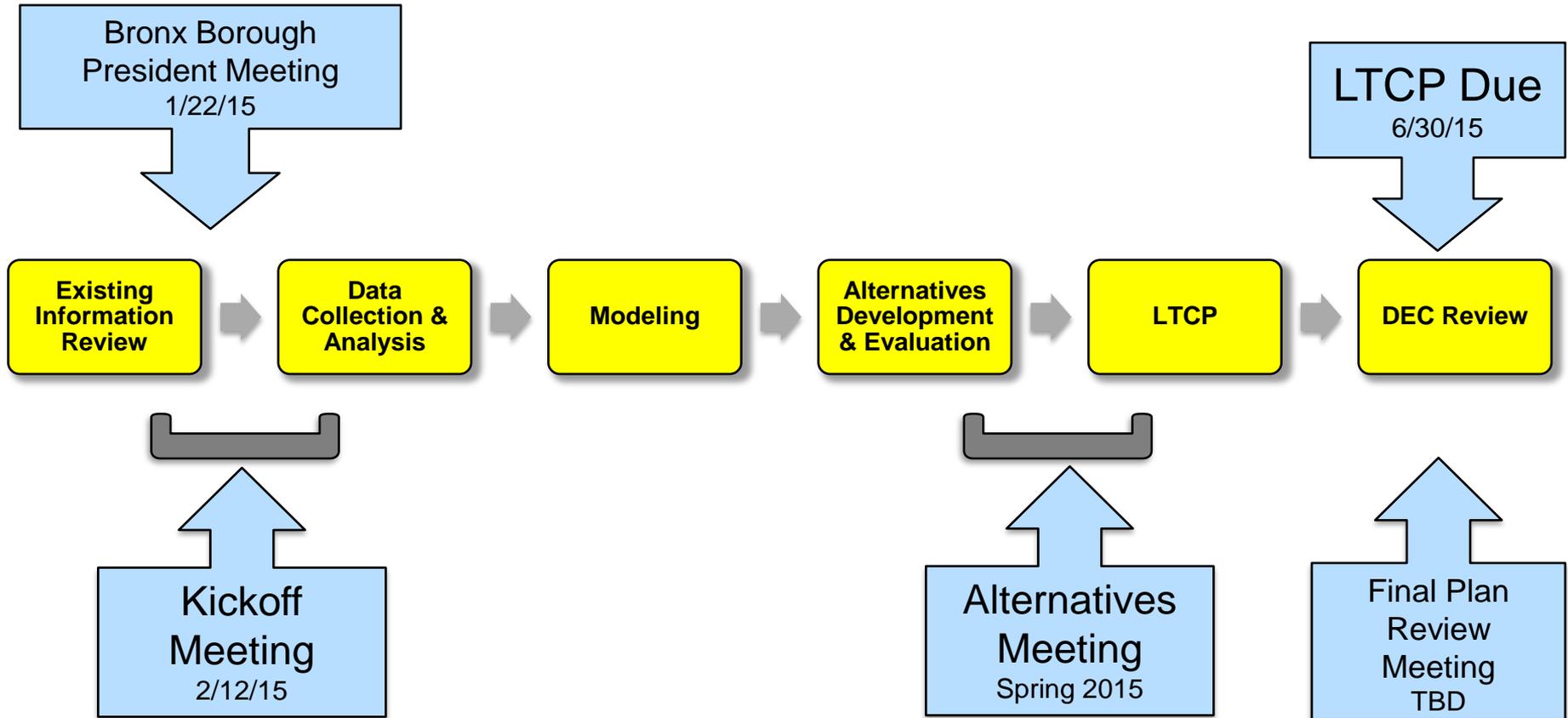
## CSO Consent Order

**an agreement that settles past legal disputes  
without prolonged litigation**

requires DEP to develop LTCPs and mitigate CSOs

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# LTCP Process and Public Involvement



**ONGOING PUBLIC/STAKEHOLDER INPUT**

## ➤ Goal:

- Raise awareness, foster understanding, and encourage input on LTCP development.

## ➤ Activities:

- **Local public meetings in each watershed and existing forums**
- Annual citywide public meetings rotating across boroughs
- Meeting with key stakeholders and organizations
- Briefings with elected officials and their staff

## ➤ Communication Tools:

- Program Website
- Social Media
- Advisories & Notifications



# **Waterbody & Watershed Characteristics**

Jim Mueller, P.E.  
Assistant Commissioner  
DEP

# Bronx River Classifications



**CLASS C**  
Bathing/Fishing  
Westchester

**CLASS B**  
Bathing  
New York City

**CLASS I**  
Boating/Fishing  
New York City

Freshwater  
Section

Tidal  
Section

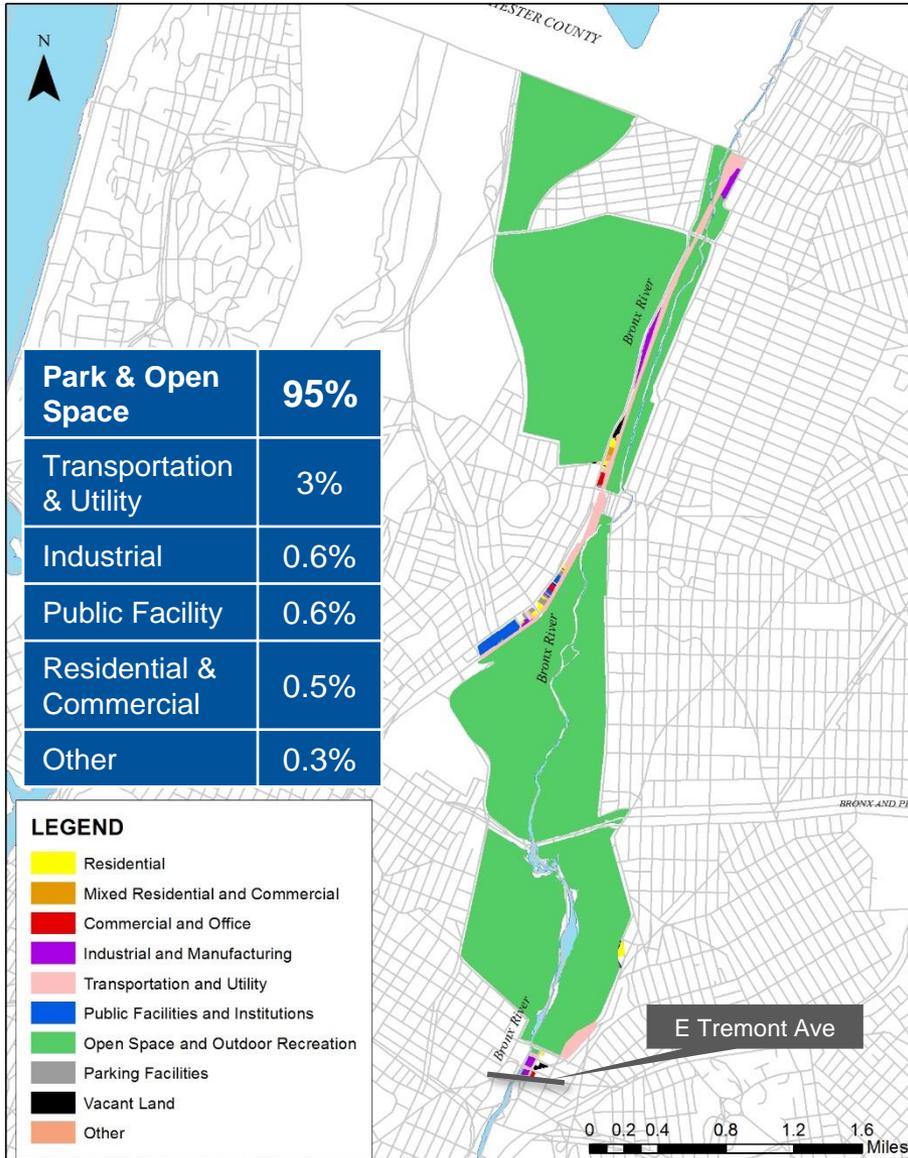
# Current Water Quality Standards

*Focusing only on the **New York City** portion of the **Bronx River**:*

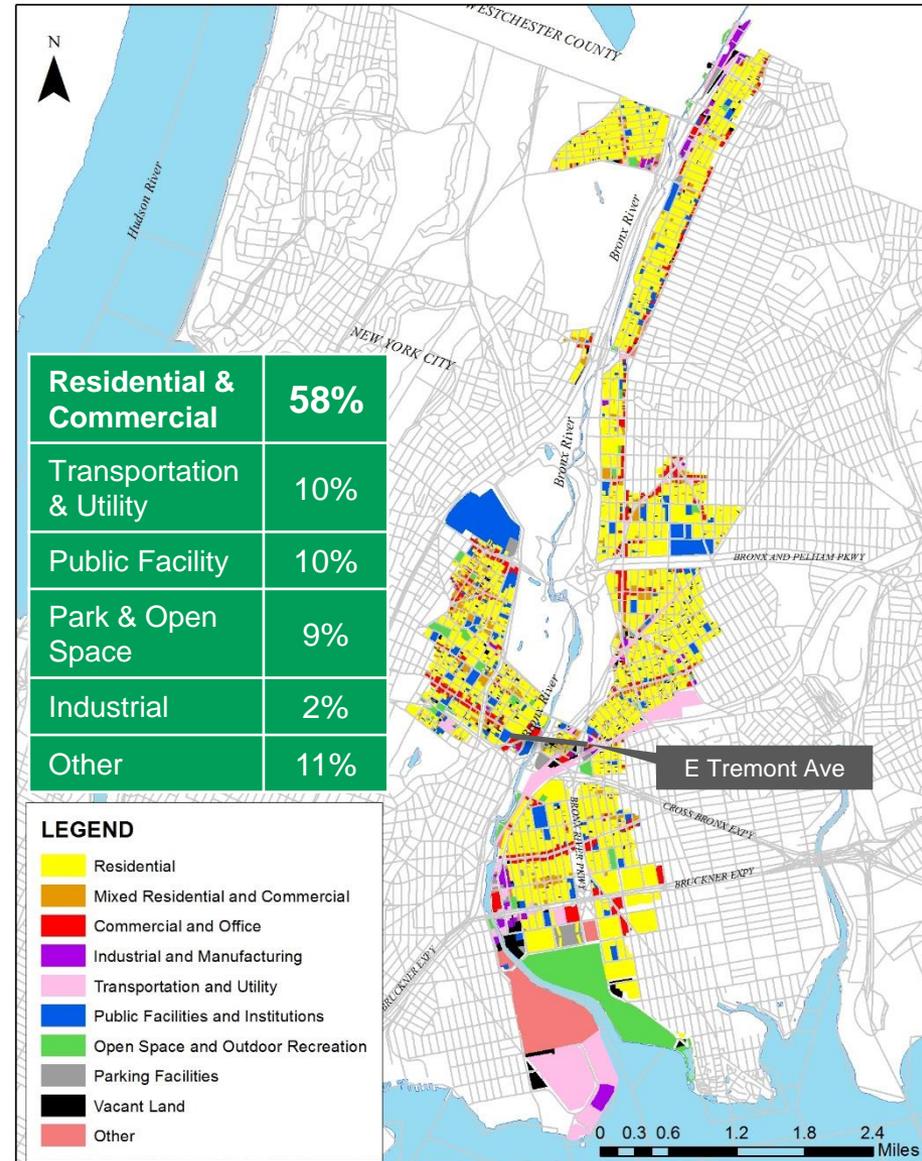
Section	Class	Dissolved Oxygen (mg/l)	Bacteria	
			Fecal Coliform (col/100 ml)	Total Coliform (col/100 ml)
<b>Freshwater</b> NORTH of E. Tremont Ave.	Class B	> 5.0 (daily avg.) ≥ 4.0	≤ 200 (Monthly GM)	≤ 2,400 (Monthly Median) and 80% ≤ 5,000
<b>Tidal</b> SOUTH of E. Tremont Ave.	Class I	≥ 4.0	≤ 2,000* (Monthly GM)	≤ 10,000 (Monthly GM)

**\*Note:** New DEC proposed rulemaking for primary contact criteria for Class I and Class SD of ≤ 200 col/100 ml for Fecal Coliform.

## Freshwater Section



## Tidal Section



## ➤ Boat Access Points

*(Contains kayak/canoe launch site)*

- 1 219<sup>th</sup> Street (Shoelace Park)
- 2 Forth Knox
- 3 Kazmiroff Blvd

## ➤ Portages

*(Re-access points to get around river obstructions)*

- A Stone Mill – Botanical Garden
- B Twin Dams – Bronx Zoo
- C River Park Dam



Twin Dams – Bronx Zoo



River Park Dam

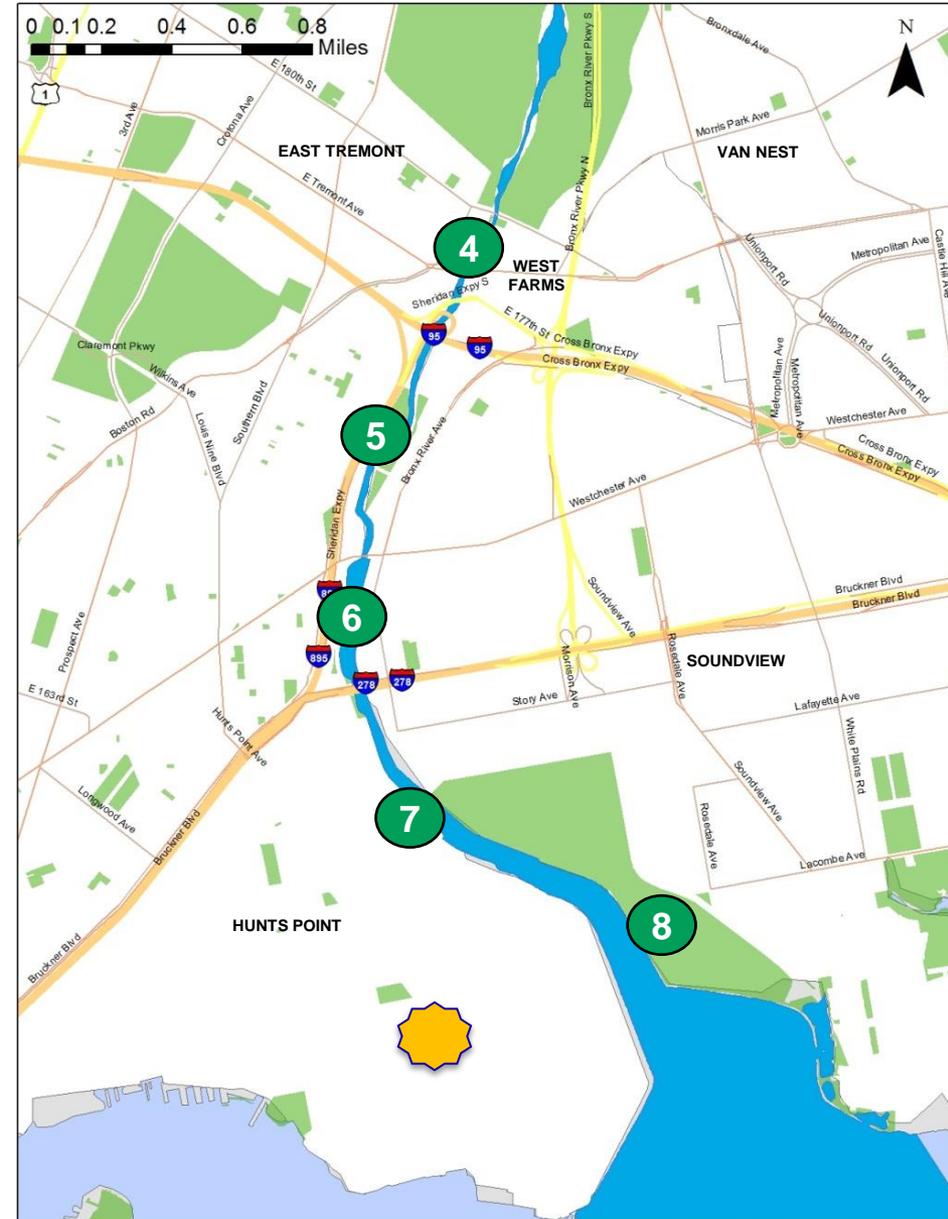
## ➤ Parks & Boat Access Points

(Contains kayak/canoe launch site)

- ④ West Farms Rapids
- ⑤ Starlight Park
- ⑥ Concrete Plant Park
- ⑦ Hunts Point Riverside Park
- ⑧ Soundview Park

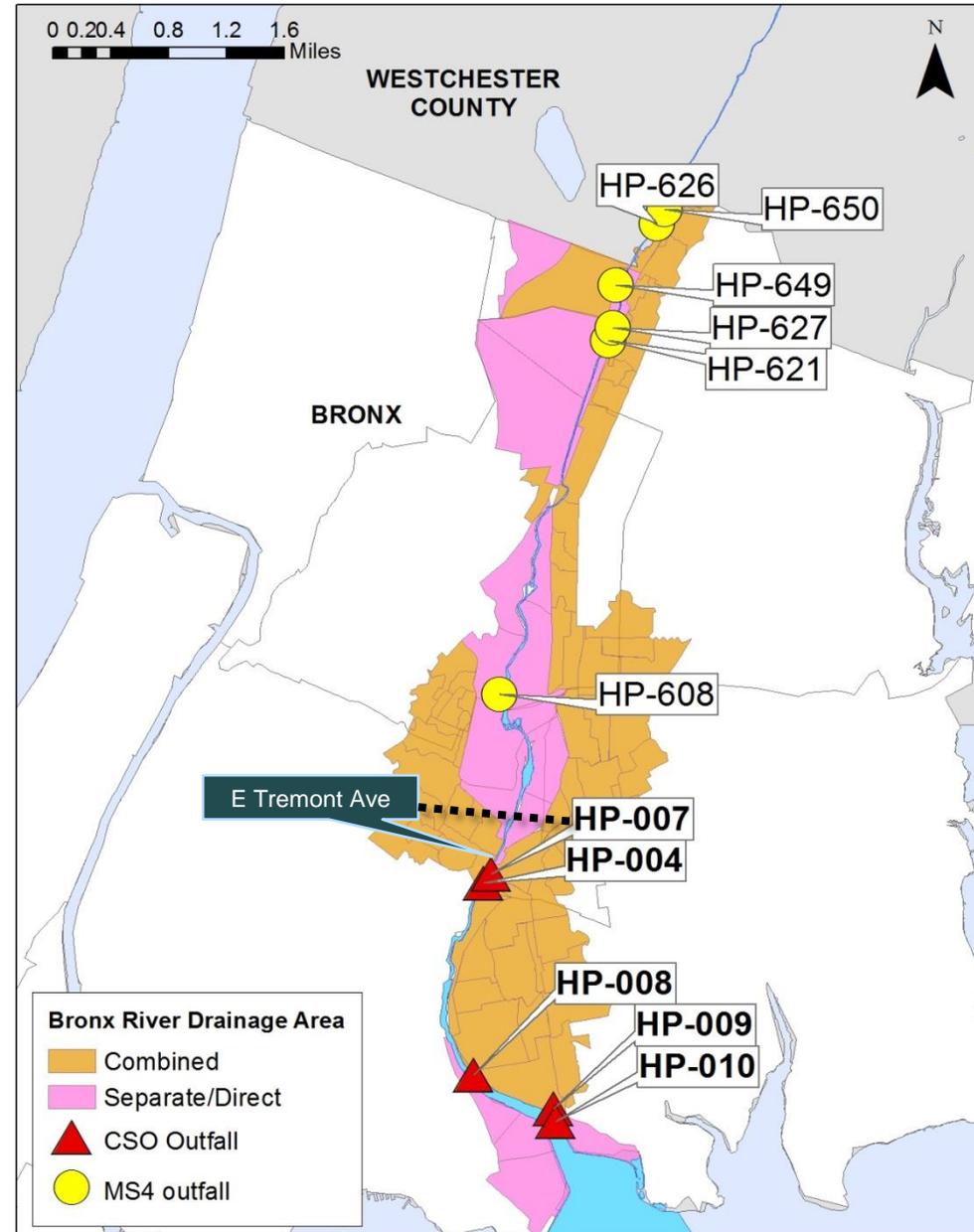
## ➤ Upcoming Development

- 🌟 Hunts Point Vision Plan



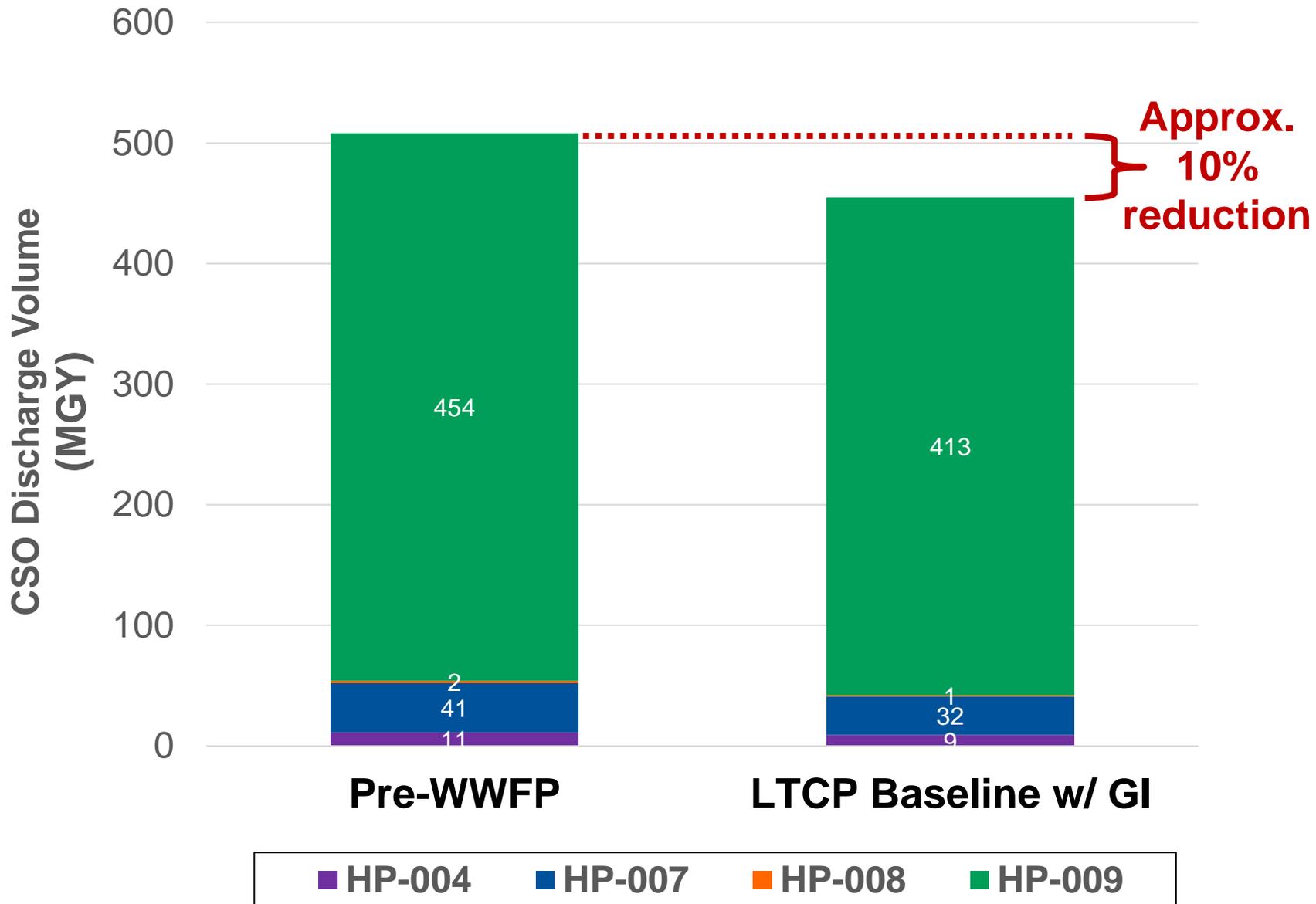
# Bronx River Drainage Area

- **Annual Wet-Weather Discharge Volume:**
  - ~1,950 MGal (*typical year*)
    - ~26% CSO
    - ~74% Direct Drainage and Stormwater
  
- **Fresh Water Section:**
  - No CSO Outfalls
  - 6 MS4 Outfalls (●)
  - Primarily direct drainage
  
- **Tidal Section:**
  - 5 CSO Outfalls (▲)
  - No MS4 Outfalls



	NYC	Westchester
Drainage Area (Acres)	4,318	23,020
Served by Combined Sewers	64%	N/A

# Modeled Bronx River CSO Volumes



# Sampling Locations

## LTCP Sampling:

### ➤ Outfall Pipe

- ▲ 2 CSO (HP-007 & HP-009)
- 2 Stormwater (HP-608, HP-627)

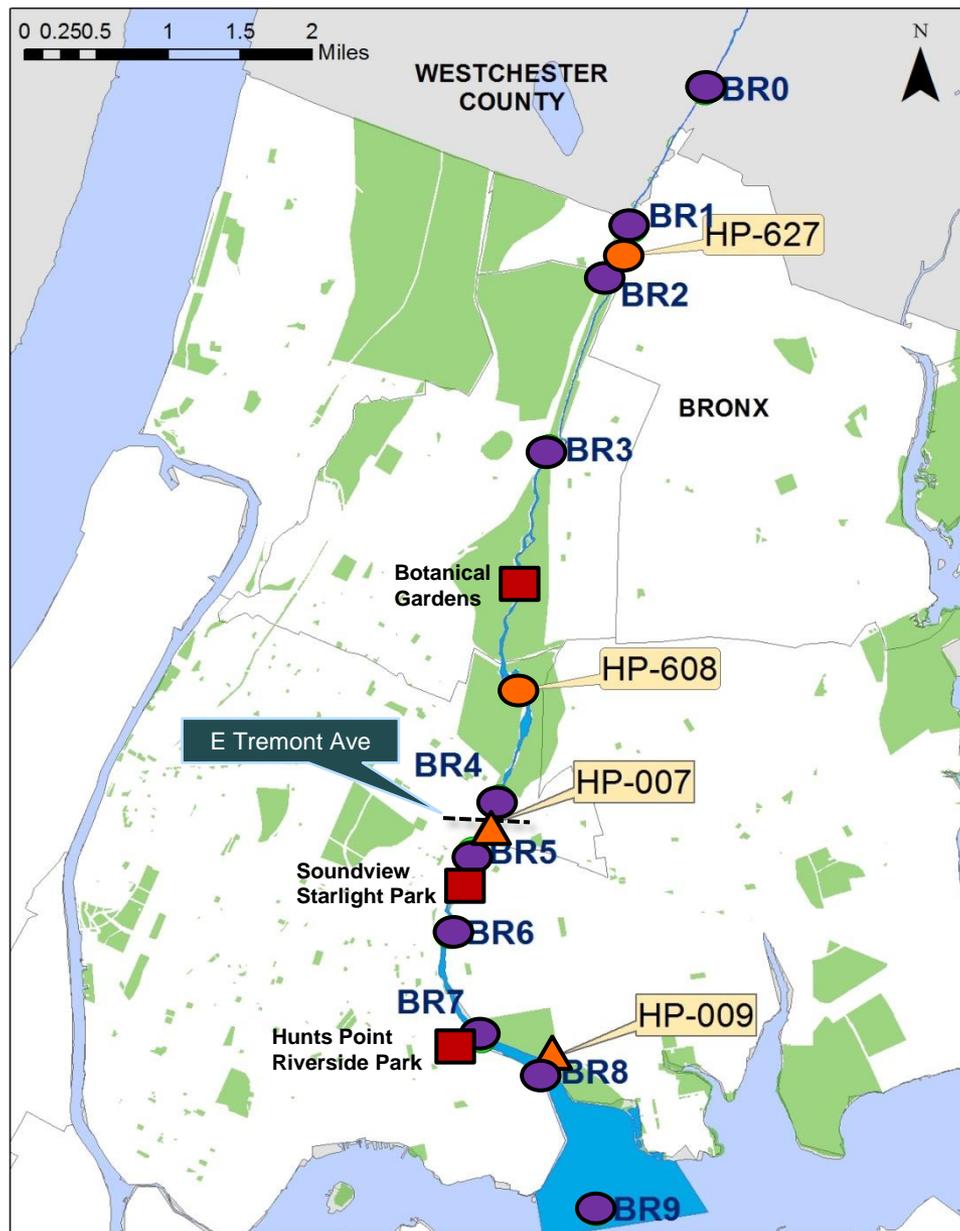
### ➤ Bronx River

- 10 Locations
  - BR0 in Westchester County
  - BR1 at County line
  - BR2 - BR9 in NYC

## Citizen Sampling:

### ➤ Bronx River

- 3 Locations Near:
  - Botanical Gardens
  - Soundview Starlight Park
  - Hunts Point Riverside Park



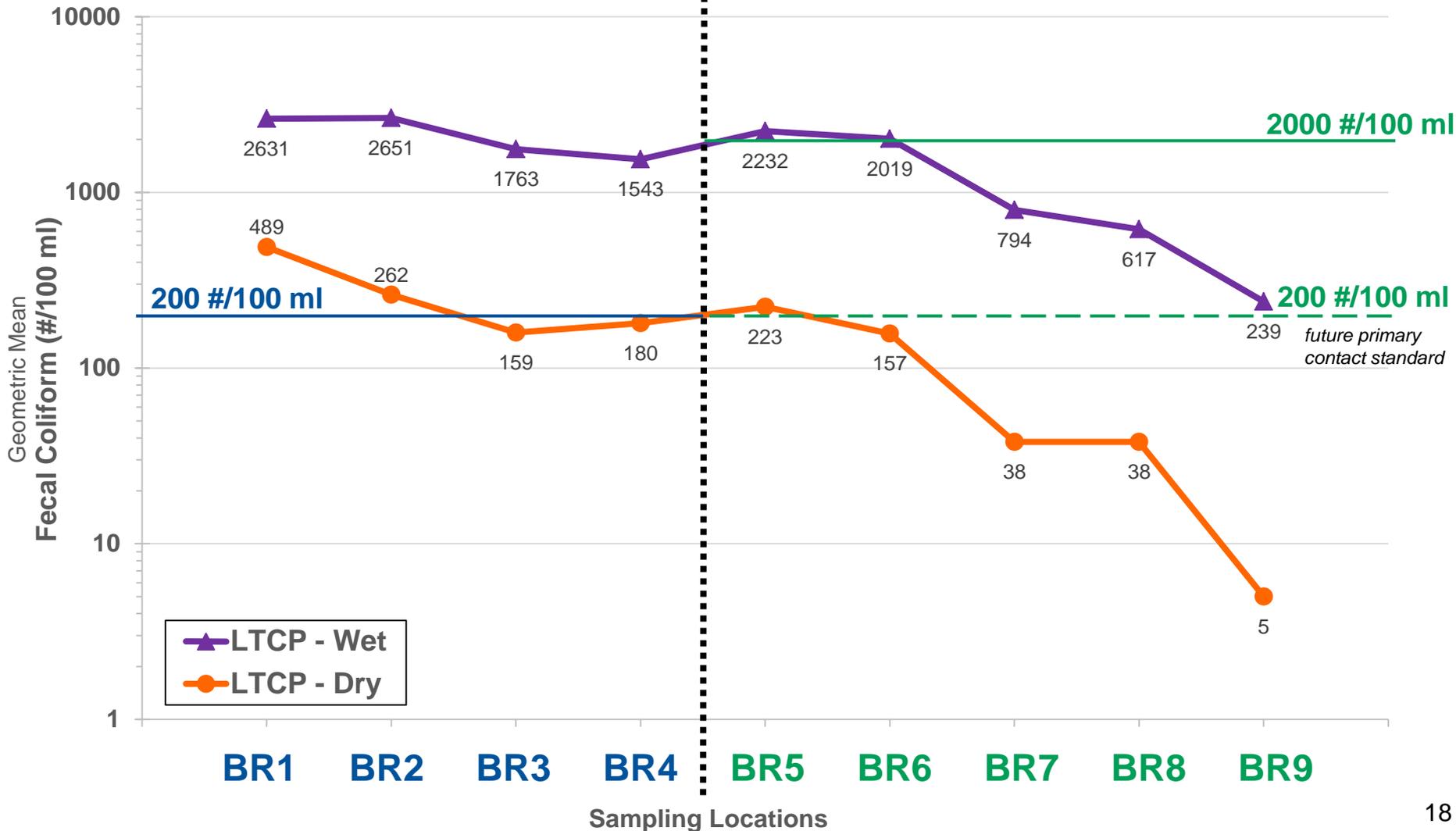
# New York City Fecal Coliform Results

(May 17<sup>th</sup>, 2014 to July 17<sup>th</sup>, 2014)

~12 Dry and ~34 Wet samples per location

## Freshwater

## Tidal



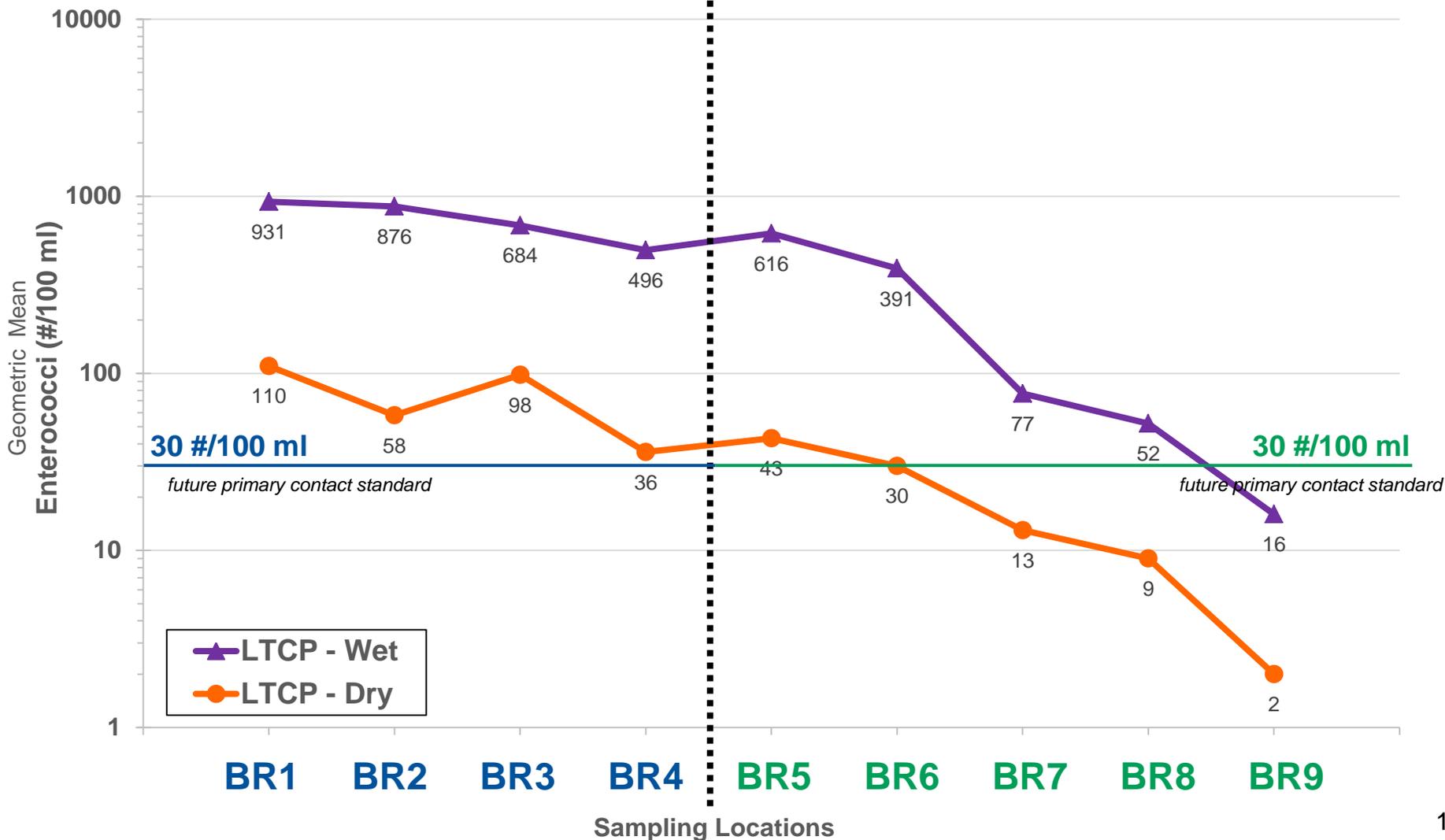
# New York City Enterococci Results

(May 17<sup>th</sup>, 2014 to July 17<sup>th</sup>, 2014)

~12 Dry and ~34 Wet samples per location

## Freshwater

## Tidal



# Illicit Discharges Between BR0 and BR1

## ➤ 4 Illicit Discharges:

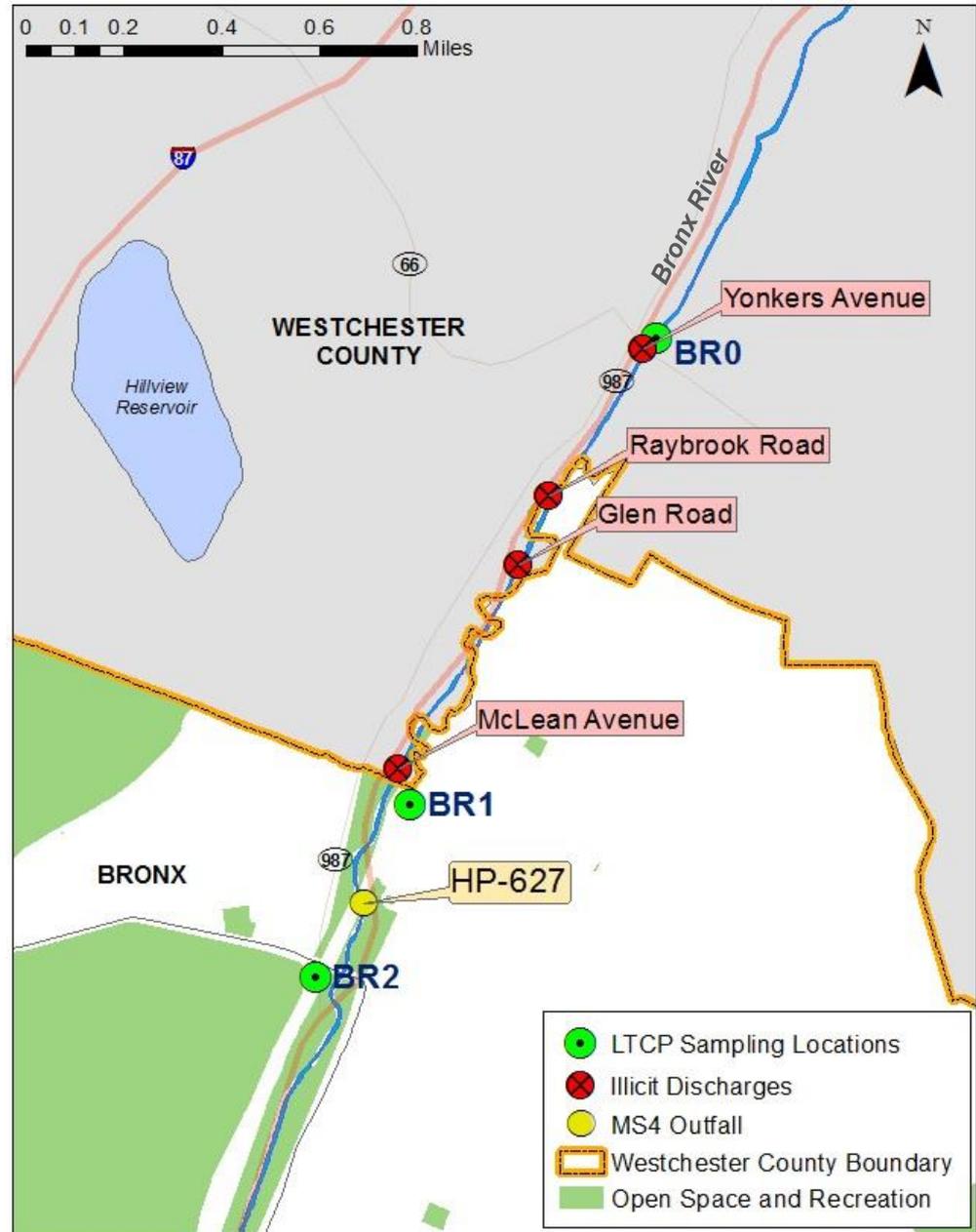
(between BR0 and BR1)

Yonkers Avenue

Raybrook Road

Glen Road

McLean Avenue



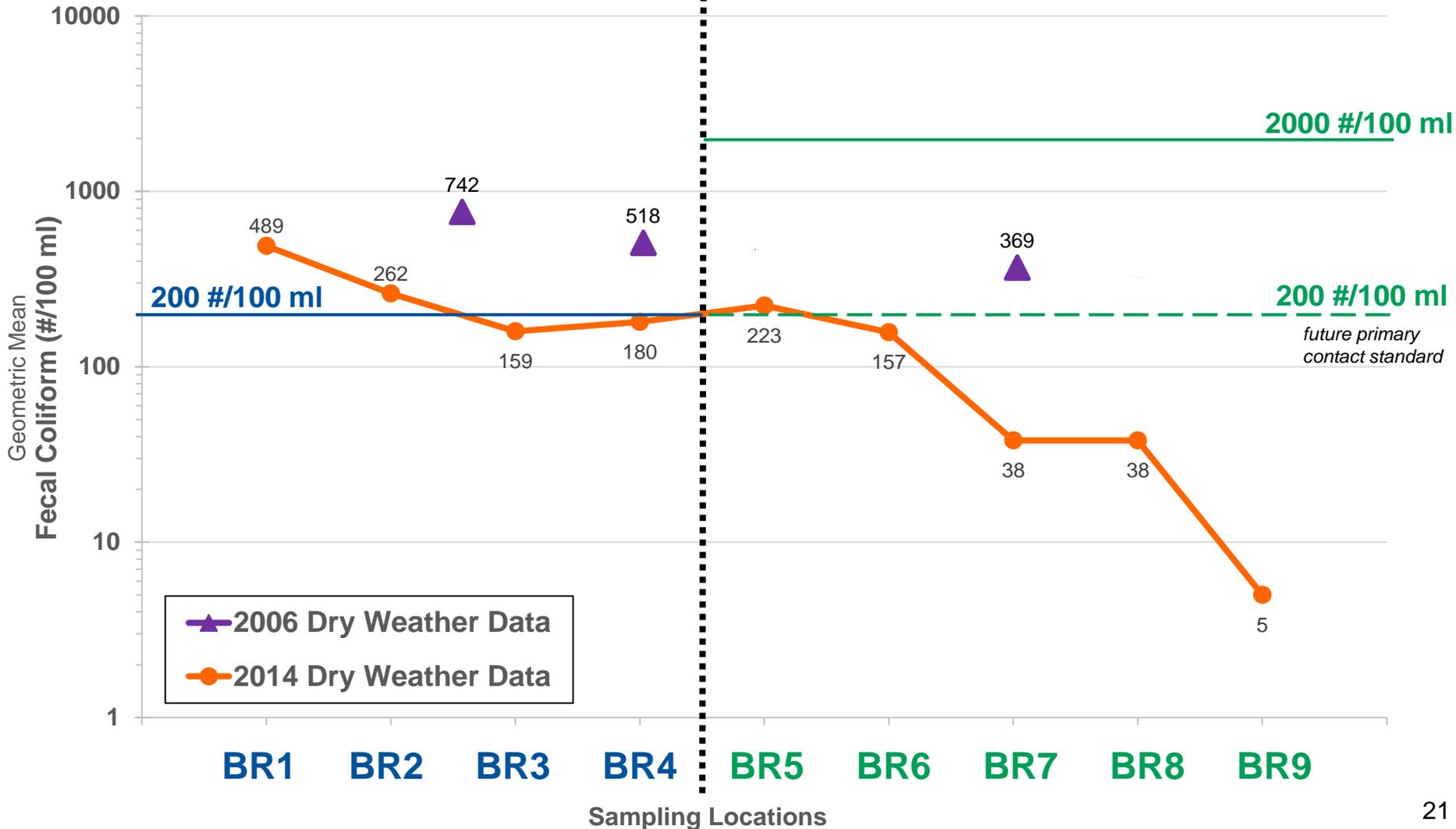
# Illicit Discharge Reduction & Water Quality Improvement

2006: 9/22/06 to 2/8/07

2014: 5/17/14 to 7/17/14

## Freshwater

## Tidal



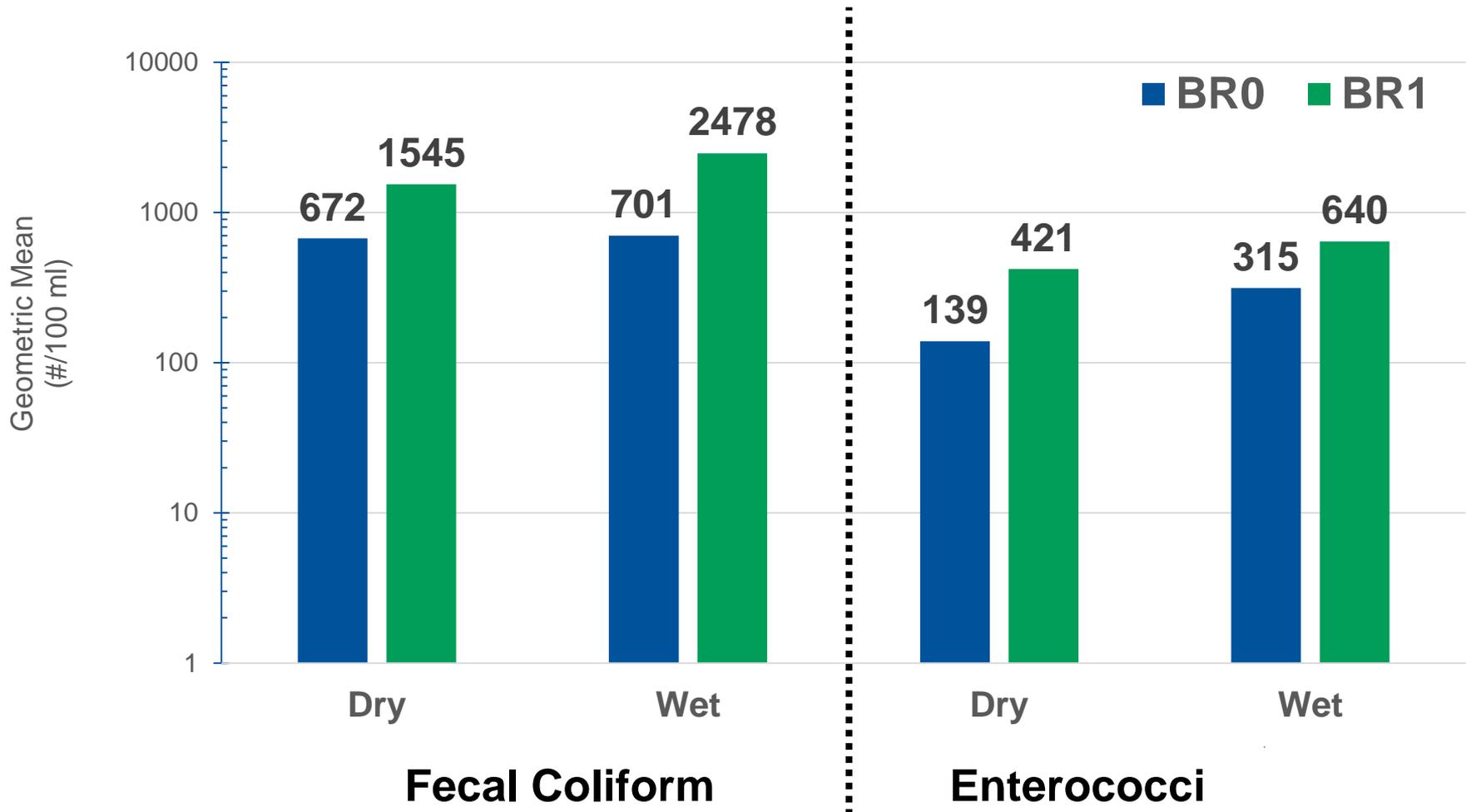
# Westchester County Sampling Results

## ➤ 2 Sampling Locations

- **BR0** in Westchester County
- **BR1** at County-NYC Boundary Line

## ➤ Sampling Period:

- **2014: July 25<sup>th</sup> to Oct. 24<sup>th</sup>**
- Bi-weekly sampling



# Water Quality Improvement Projects

## **Green Infrastructure**

Mikelle Adgate  
Project Manager  
DEP



**Bioswale**

- **Green Infrastructure (GI)** collects stormwater runoff from impervious surfaces
- 2012 Amended Consent Order: GI investments over 20 years
- Budget **\$1.5 billion** for GI Citywide to manage 1” of stormwater runoff from 10% of impervious combined sewered areas by 2030
- Meet this goal through:
  - Bioswale Area-Wide Projects
  - Public Property Retrofits
  - Grant Program for Private Property Owners
  - Stringent Detention Rule

# Bioswale



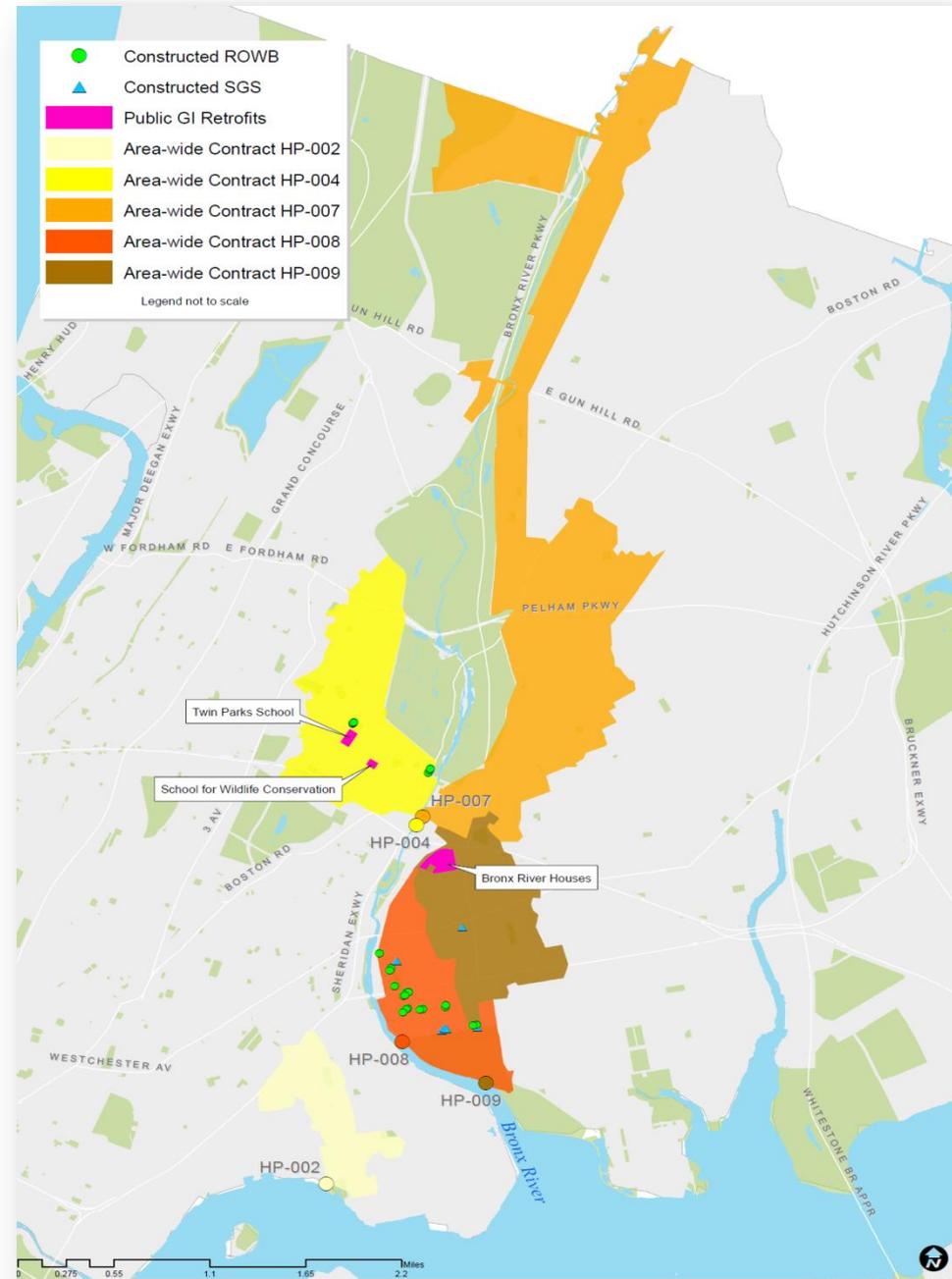
# Planned GI Projects in Bronx River

## Area-Wide GI Contracts:

- 23 bioswales and 8 stormwater greenstreets constructed to date in HP-008 and HP-009
- Design will begin in HP-002, HP-004 and HP-007 in 2016

## Other Built and Planned Projects:

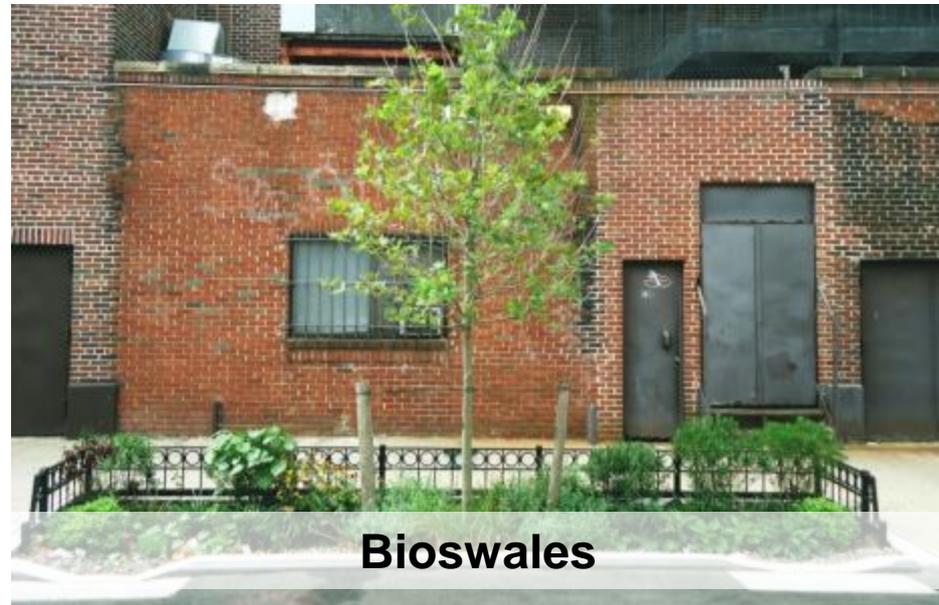
- **Partnership with NYCHA and DPR:**
  - Bronx River Houses
  - Shoelace Park
- **Partnership with TPL/SCA/DOE:**
  - P.S. 129 (in construction)
  - P.S. 67 (under consideration)
- **GI Grant Program:**
  - ~\$1 million for the Bronx Zoo's Parking Lot – rain gardens, porous paving



# Types of Green Infrastructure



**Permeable Pavers**



**Bioswales**



**Green Roof**



**Rain Garden**

# GI Milestones and Program Focuses

2011-2015	2016-2020	2021-2025	2026-2030
<b>1.5%</b>	<b>4%</b>	<b>7%</b>	<b>10%</b>
<b>Heavy ROW Focus</b> <i>Inter-agency partnerships, ROW design standards, Area-wide approach for design, construction &amp; maintenance</i>	<b>Continuing Focus on ROW Projects</b>	<b>Continuing work on ROW Projects</b>	<b>All work continuing until 10% target is reached</b>
<b>Early Projects/Queue future projects</b> <i>Site screening and analysis, design/construct projects with DPR, NYCHA, and DOE</i>	<b>Greater Onsite implementation</b> <i>Further design and construction, Ongoing site screening and analysis</i>	<b>Continued Onsite implementation</b>	
<b>Planning/Analysis for additional GI tools</b> <i>Pilot construction and monitoring</i>	<b>Continued analysis and monitoring R&amp;D Program</b>	<b>Continued implementation of innovative designs and GI tools</b>	
<b>Innovative design and development</b>	<b>Further development of new tools R&amp;D Program</b>		

**Related LTCP Milestones**

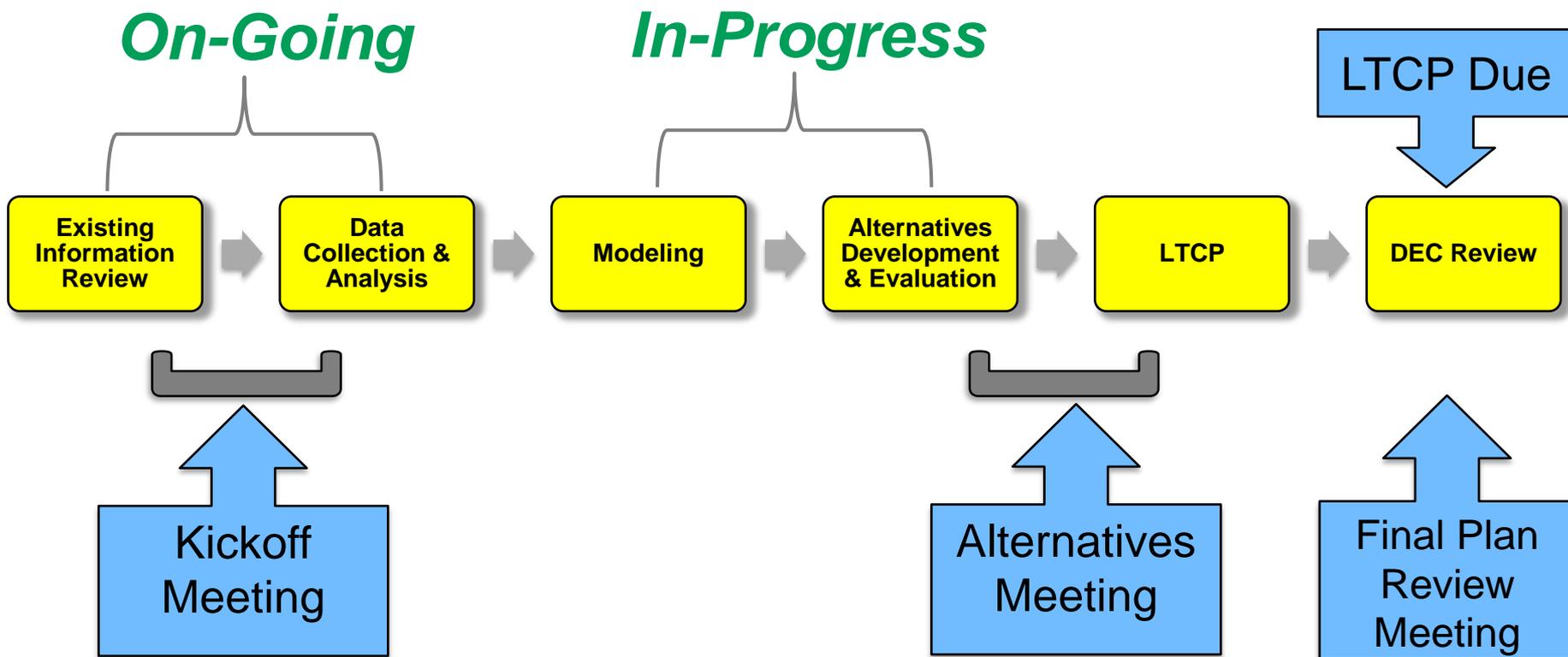
2016 Performance Metrics Report

2017 Citywide LTCP

- **Green Infrastructure Grant Program:** DEP provides up to 100% reimbursement for the design and construction of select green infrastructure on private property in combined sewer areas.
- **Green Roof Tax Abatement:** The City provides a one year property tax abatement for private properties that install a green roof. The value is \$5.23 per square foot (up to the lesser of \$200,000 or the building's tax liability) and is available through March 15, 2018.
- **2012 Stormwater Rule:** In 2012 DEP modified the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may use green infrastructure technologies to meet the new allowable rate.

# **Bronx River LTCP Development**

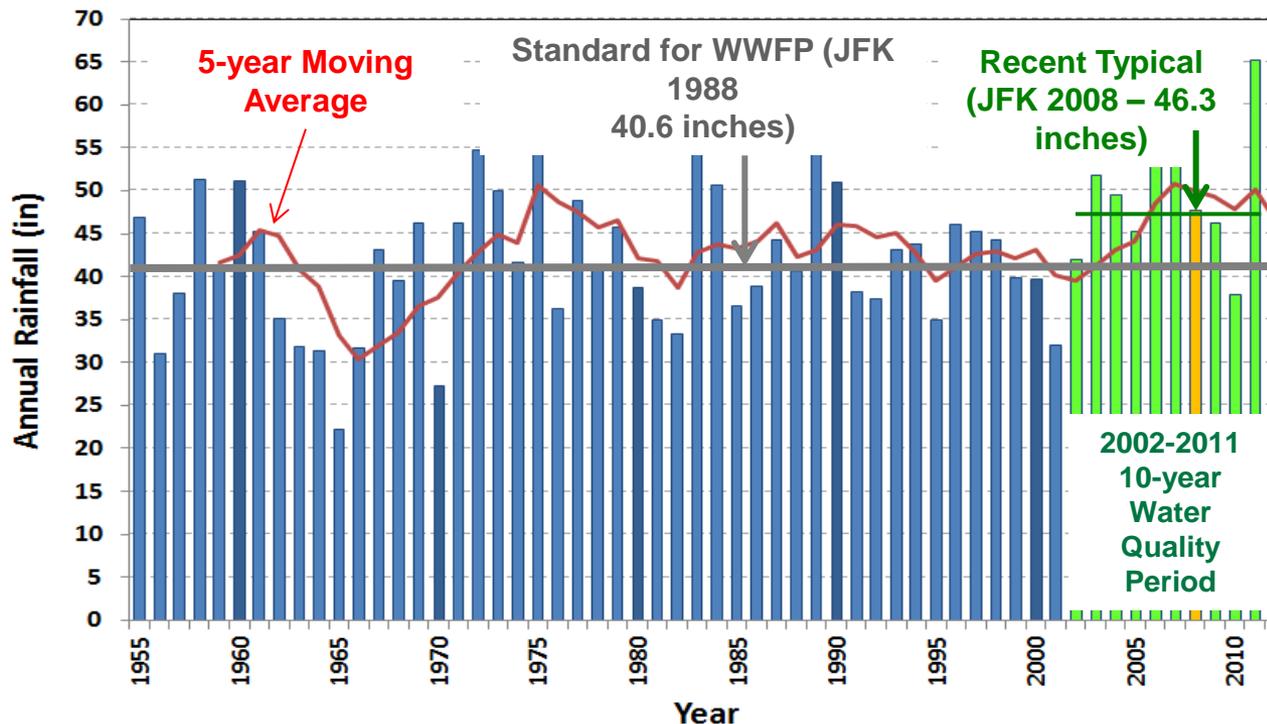
Jim Mueller, P.E.  
Assistant Commissioner  
DEP



**ONGOING PUBLIC/STAKEHOLDER INPUT**

# Model Updates & Baseline Assumptions

- Model runs are based on 10 years of data (2002 – 2011) for pathogens; 1 year of data used for DO (2008, “typical year rainfall”)
- 2040 population projections
- Model is calibrated with Harbor Survey data plus LTCP sampling data
- 2012 InfoWorks recalibration based on revised impervious areas



# CSO Mitigation Toolbox

**INCREASING COMPLEXITY** 

**INCREASING COST** 

<b>System Optimization</b>	Fixed Weir	Parallel Interceptor / Sewer	Inflatable Dams Bending Weirs Control Gates	Pump Station Expansion
<b>CSO Relocation</b>	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping	
<b>Water Quality / Ecological Enhancement</b>	Floatables Control	Dredging	Dissolved Oxygen Improvement	Flushing Tunnel
<b>Treatment</b> <i>Satellite:</i>	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)
<i>Centralized:</i>	WWTP Expansion			
<b>Storage</b>	In-System	Shaft	Tank	Tunnel



## 1. Bacteria Source Component Analysis

- CSO, stormwater and direct drainage

## 2. Gap Analysis for Water Quality Standard Attainment

- Calculate Bacteria and DO for Baseline conditions
- Calculate Bacteria and DO for 100% control conditions

## 3. Matching CSO Scenarios to CSO Engineering Control Alternatives



**100%** Storage

**75%** Treatment

**50%** System Optimization

**25%** Source Control

# CSO Mitigation Options for HP-007

INCREASING COMPLEXITY 

INCREASING COST 

<b>System Optimization</b>	<b>Fixed Weir</b>	<b>Parallel Interceptor / Sewer</b>	<b>Inflatable Dams Bending Weirs Control Gates</b>	<del>Pump Station Expansion</del>
<b>CSO Relocation</b>	<del>Gravity Flow Tipping to Other Watersheds</del>	<del>Pumping Station Modification</del>	<del>Flow Tipping with Conduit/Tunnel and Pumping</del>	
<b>Water Quality / Ecological Enhancement</b>	<del>Floatables Control*</del>	<del>Dredging</del>	<b>Dissolved Oxygen Improvement</b>	<del>Flushing Tunnel</del>
<b>Treatment Satellite:</b>	<b>Outfall Disinfection</b>	<b>Retention Treatment Basin (RTB)</b>		<del>High Rate Clarification (HRC)</del>
<b>Centralized:</b>	<del>WWTP Expansion</del>			
<b>Storage</b>	<del>In-System</del>	<del>Shaft</del>	<b>Tank</b>	<b>Tunnel</b>

\*NOTE: Floatables Control is already provided at HP-007.



# CSO Mitigation Options for HP-009

INCREASING COMPLEXITY 

INCREASING COST 

<b>System Optimization</b>	<b>Fixed Weir</b>	<b>Parallel Interceptor / Sewer</b>	<b>Inflatable Dams Bending Weirs Control Gates</b>	<del>Pump Station Expansion</del>
<b>CSO Relocation</b>	<b>Gravity Flow Tipping to Other Watersheds</b>	<del>Pumping Station Modification</del>	<del>Flow Tipping with Conduit/Tunnel and Pumping</del>	
<b>Water Quality / Ecological Enhancement</b>	<del>Floatables Control*</del>	<del>Dredging</del>	<del>Dissolved Oxygen Improvement</del>	<del>Flushing Tunnel</del>
<b>Treatment Satellite:</b>	<b>Outfall Disinfection</b>	<b>Retention Treatment Basin (RTB)</b>		<del>High Rate Clarification (HRC)</del>
<b>Centralized:</b>	<del>WWTP Expansion</del>			
<b>Storage</b>	<del>In-System</del>	<del>Shaft</del>	<b>Tank</b>	<b>Tunnel</b>

\*NOTE: Floatables Control is already provided at HP-009.

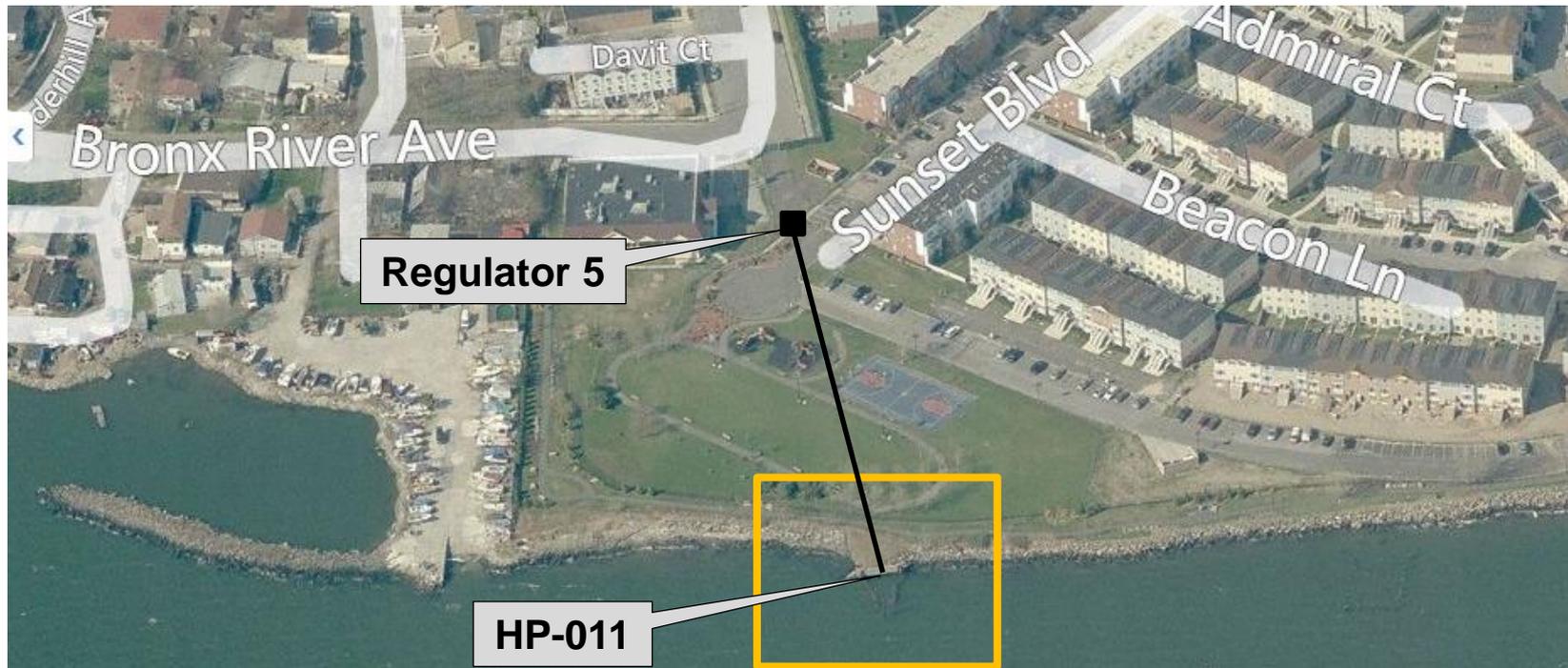


# CSO Mitigation Options for HP-011

INCREASING COMPLEXITY 

INCREASING COST 

<b>System Optimization</b>	<del>Fixed Weir</del>	<del>Parallel Interceptor / Sewer</del>	<del>Inflatable Dams Bending Weirs Control Gates</del>	<del>Pump Station Expansion</del>
<b>CSO Relocation</b>	<del>Gravity Flow Tipping to Other Watersheds</del>	<del>Pumping Station Modification</del>	<del>Flow Tipping with Conduit/Tunnel and Pumping</del>	
<b>Water Quality / Ecological Enhancement</b>	<b>Floatables Control</b>	<del>Dredging</del>	<del>Dissolved Oxygen Improvement</del>	<del>Flushing Tunnel</del>
<b>Treatment Satellite:</b>	<del>Outfall Disinfection</del>	<del>Retention Treatment Basin (RTB)</del>		<del>High Rate Clarification (HRC)</del>
<b>Centralized:</b>	<del>WWTP Expansion</del>			
<b>Storage</b>	<del>In-System</del>	<del>Shaft</del>	<del>Tank</del>	<del>Tunnel</del>



**Nets for Floatables Control**



**Bending Weirs**

- Bronx River LTCP Public Meeting #2, April 2015
  - Objective: Review proposed alternatives and related waterbody uses and revisiting attainments of water quality standards
  - LTCP Submittal to NYSDEC is June 2015
  
- Comments can also be submitted to:
  - New York City DEP at: [ltcp@dep.nyc.gov](mailto:ltcp@dep.nyc.gov)

- Visit the informational tables tonight for handouts and poster boards with detailed information
  
- Go to [www.nyc.gov/dep/ltcp](http://www.nyc.gov/dep/ltcp) to access:
  - LTCP Public Participation Plan
  - Presentation, handouts and poster boards from this meeting
  - Links to Waterbody/Watershed Facility Plans
  - CSO Order including LTCP Goal Statement
  - NYC's Green Infrastructure Plan
  - Green Infrastructure Pilots 2011 and 2012 Monitoring Results
  - NYC Waterbody Advisory Program
  - Upcoming meeting announcements
  - Other LTCP updates

# Open Discussion