Bronx River
Combined Sewer Overflow
Long Term Control Plan

Public Meeting #2

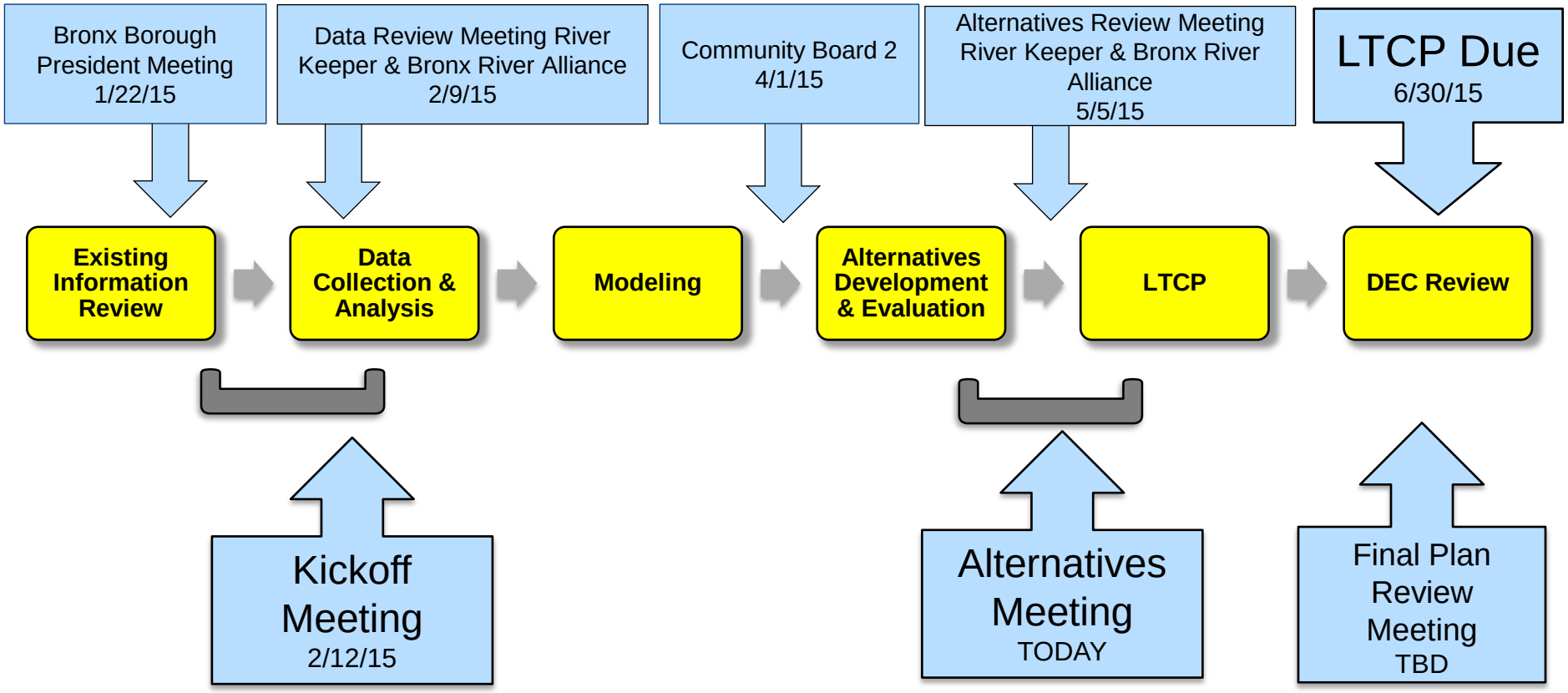
Review of Alternatives

Casita Maria Center for Arts and Education
May 7, 2015

Welcome & Introductions

Eric Landau
Associate Commissioner
DEP

LTCP Process and Public Involvement



ONGOING PUBLIC/STAKEHOLDER INPUT

Public Comments

Bronx River Alliance:

- Bronx River has enjoyed steady improvements and has an active constituency of users, making water quality a priority for this waterbody
- Public Comments:
  - Control CSOs and address upstream issues
  - Making river safe for primary contact is long term goal
  - Consider alternatives that make the river safe for primary contact throughout the entire year and as soon as possible after a rain event

Bronx River Sections

Freshwater Section

Tidal Section

Freshwater Section – Current Uses

➢ Boat Access Points

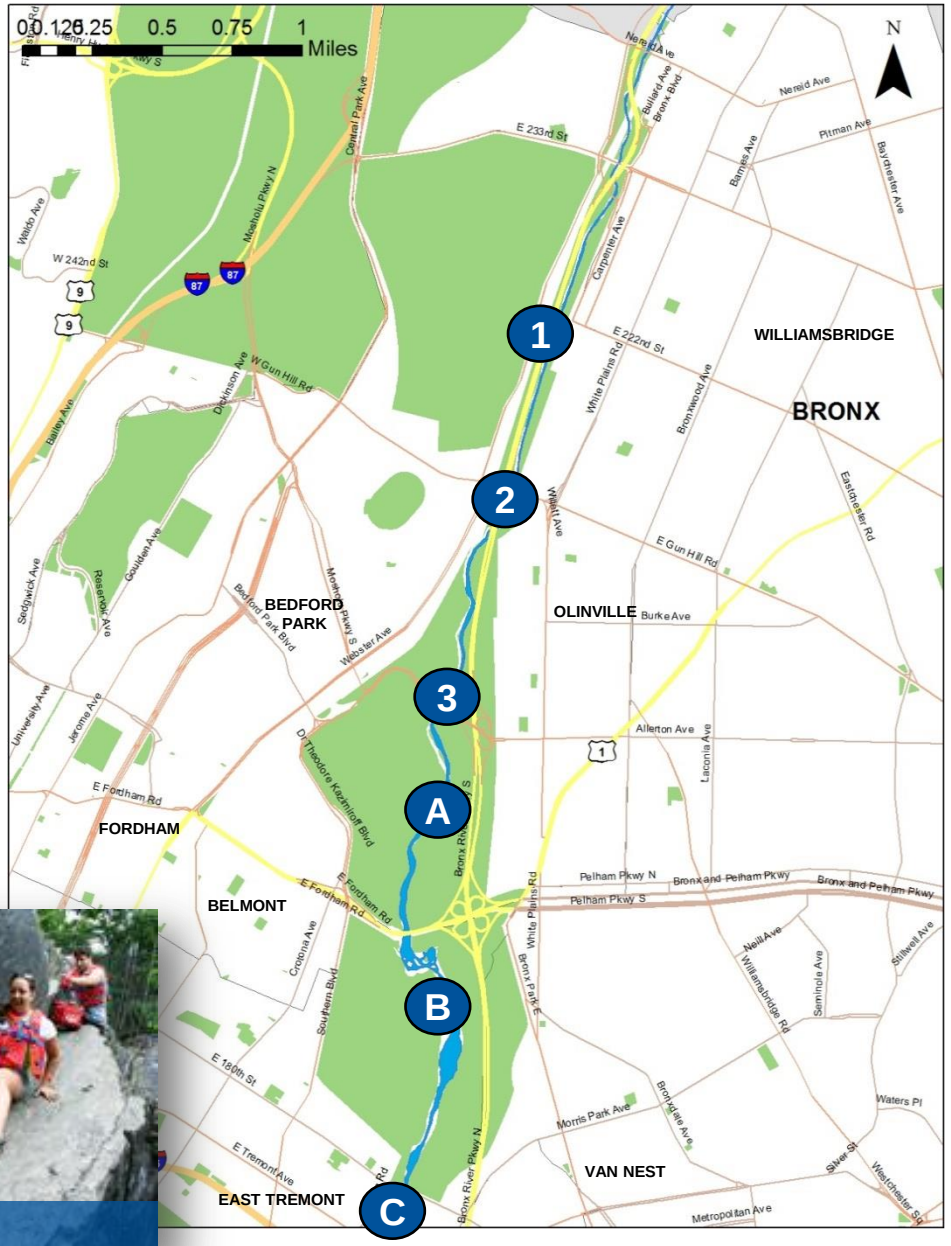
(Contains kayak/canoe launch site)

1. 219th 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

Tidal Section – Current Uses

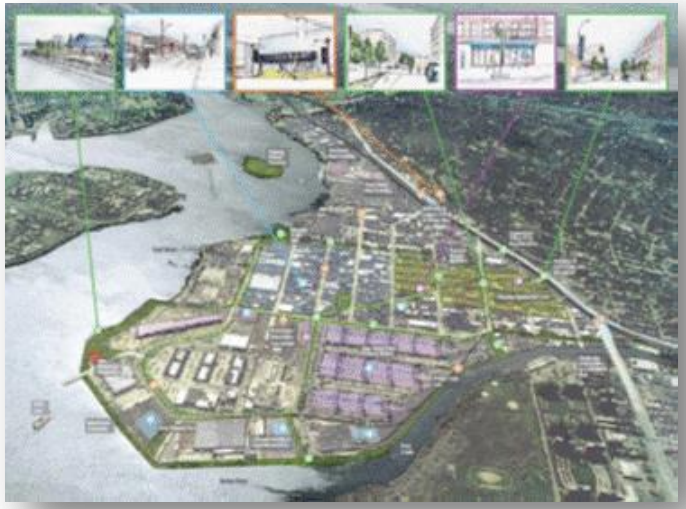
➢ Parks & Boat Access Points

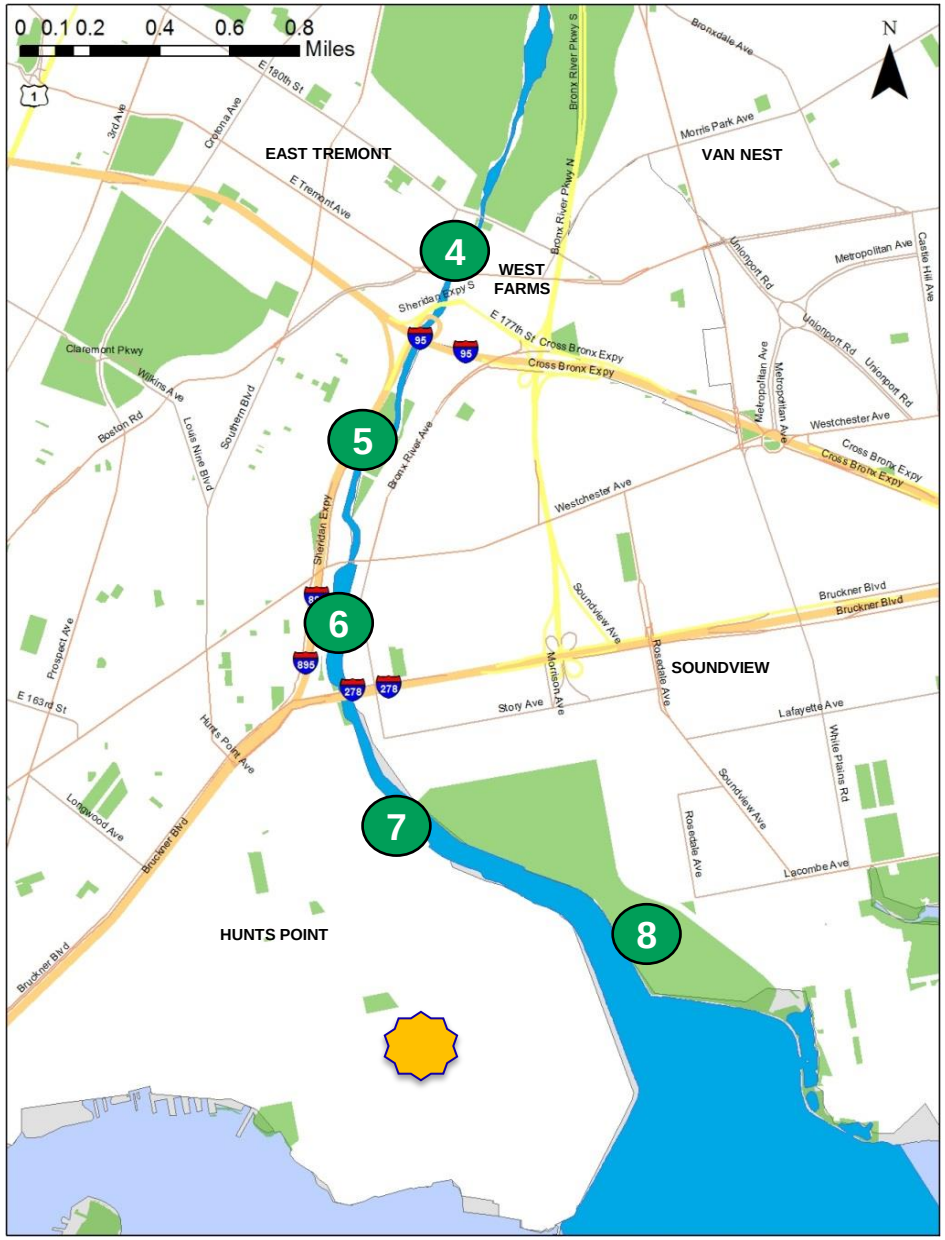
(Contains kayak/canoe launch site)

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**





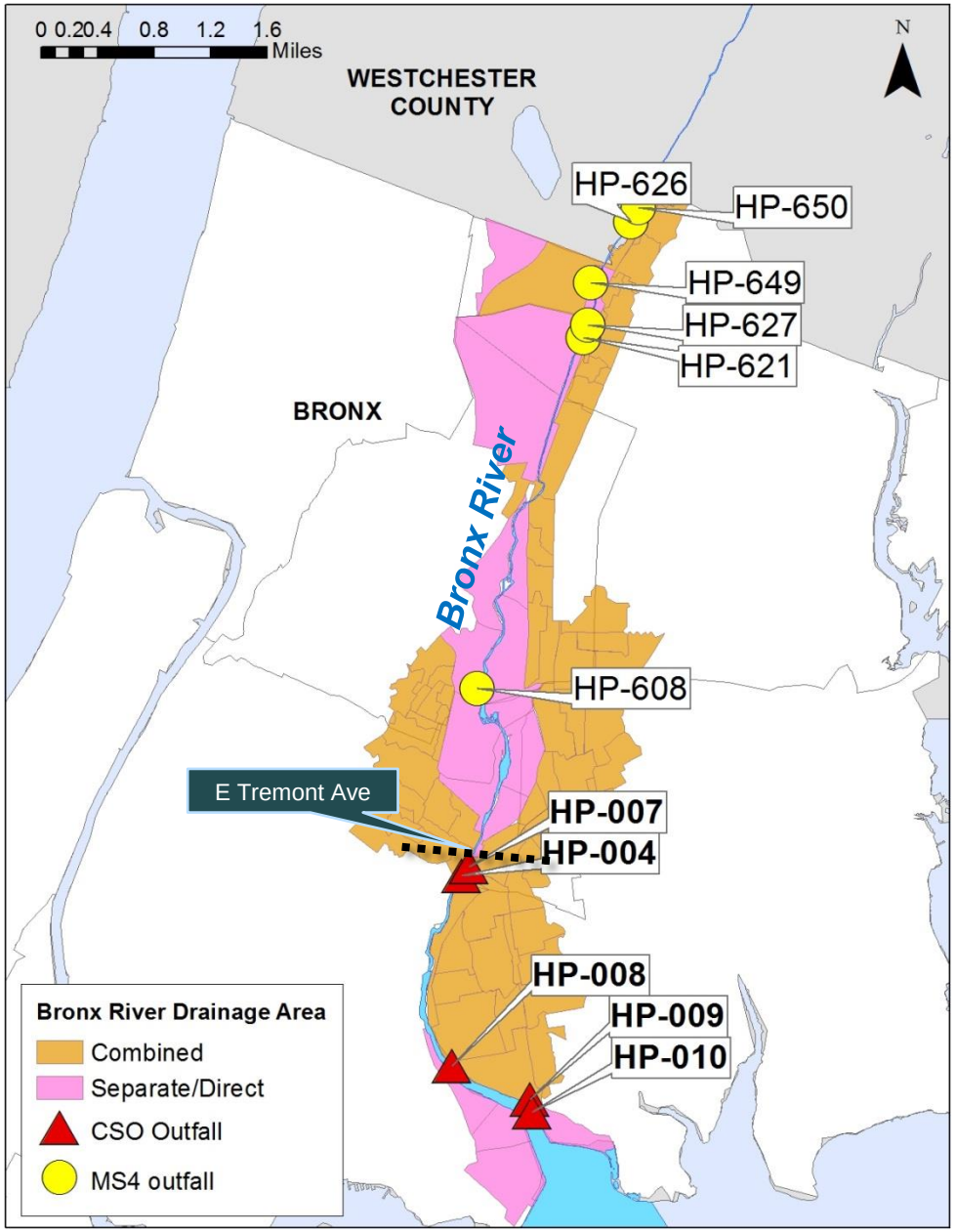
Sampling and Modeling

Jim Mueller, P.E.
Assistant Commissioner
DEP

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



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)
Freshwater NORTH of E. Tremont Ave.	Class B	never less than 4.0 daily average > 5.0	≤ 200 (Monthly GM)	≤ 2,400 (Monthly Median) and 80% ≤ 5,000
Tidal 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.

Sampling Locations

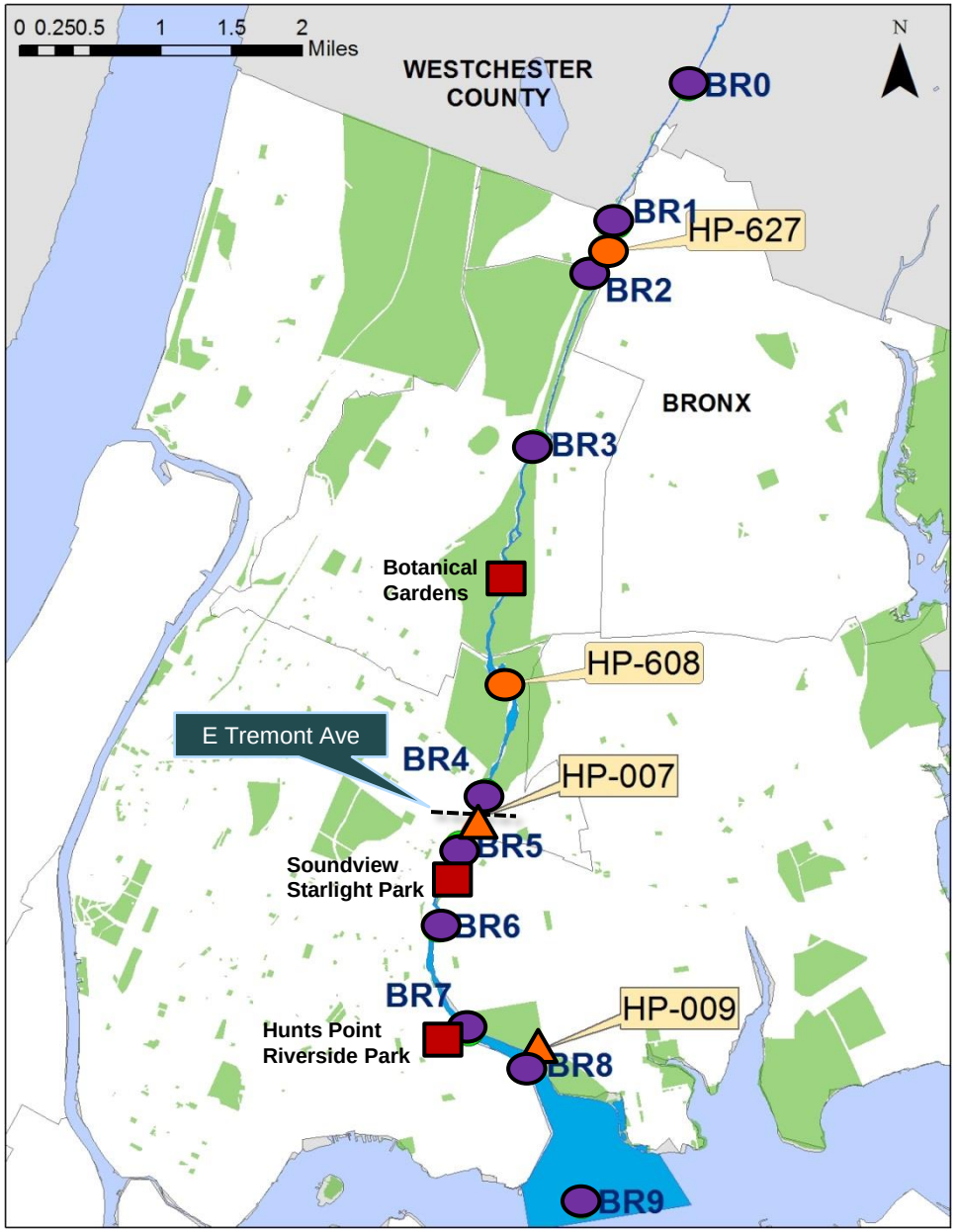
LTCP Sampling:

- **Outfall Pipe**
  - 2 CSO (HP-007 & HP-009)
  - 2 Stormwater (HP-608, HP-627)

- **Bronx River**
  - 10 Locations (1100+ analyses)
    - BR0 in Westchester County
    - BR1 at County line
    - BR2 - BR9 in NYC

Citizen Sampling:

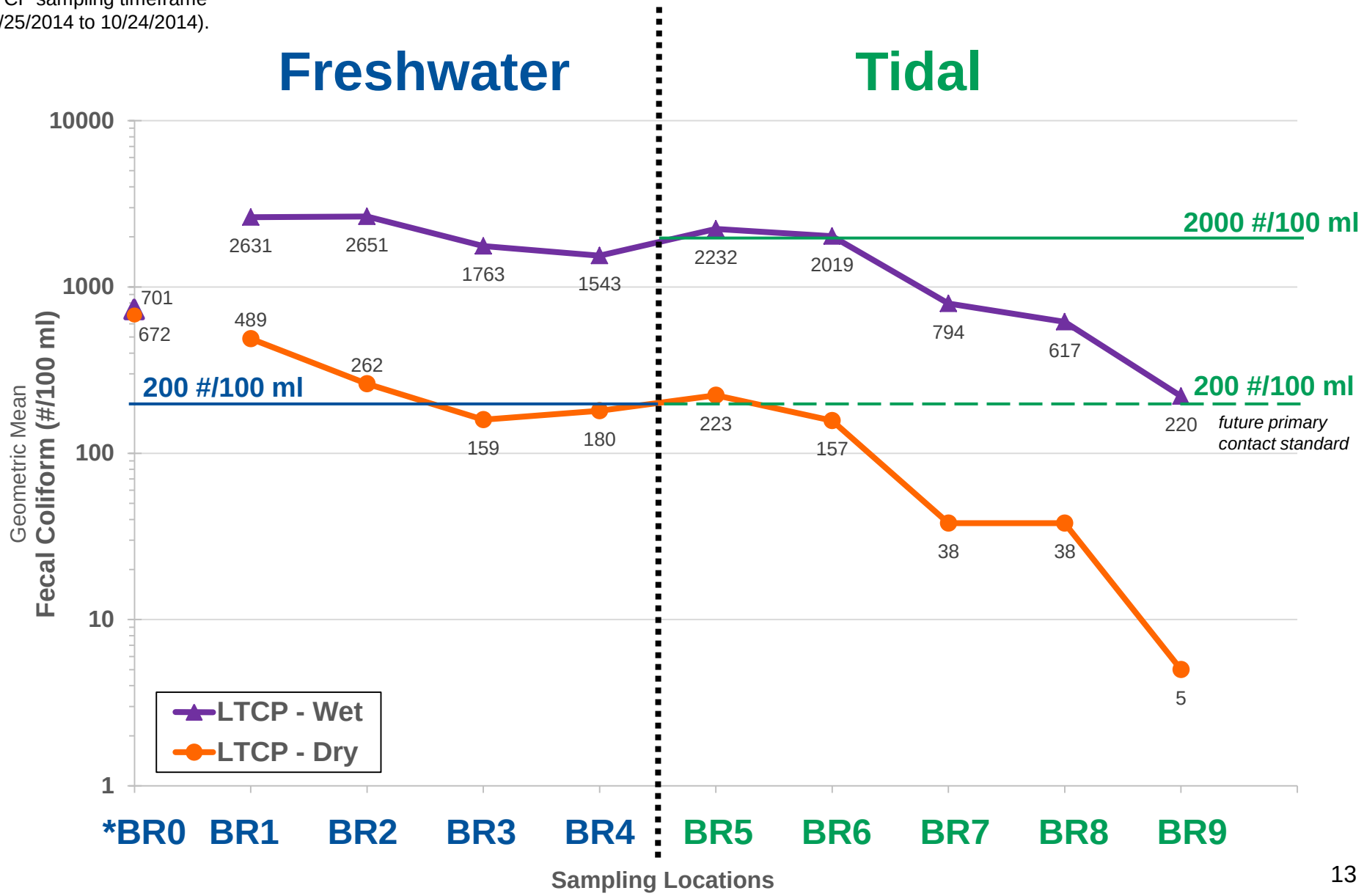
- **Bronx River**
  - 3 Locations Near:
    - Botanical Gardens
    - Soundview Starlight Park
    - Hunts Point Riverside Park



Fecal Coliform Sampling Results - GMs

***BR0** county line bi-weekly sampling conducted outside LTCP sampling timeframe (7/25/2014 to 10/24/2014).

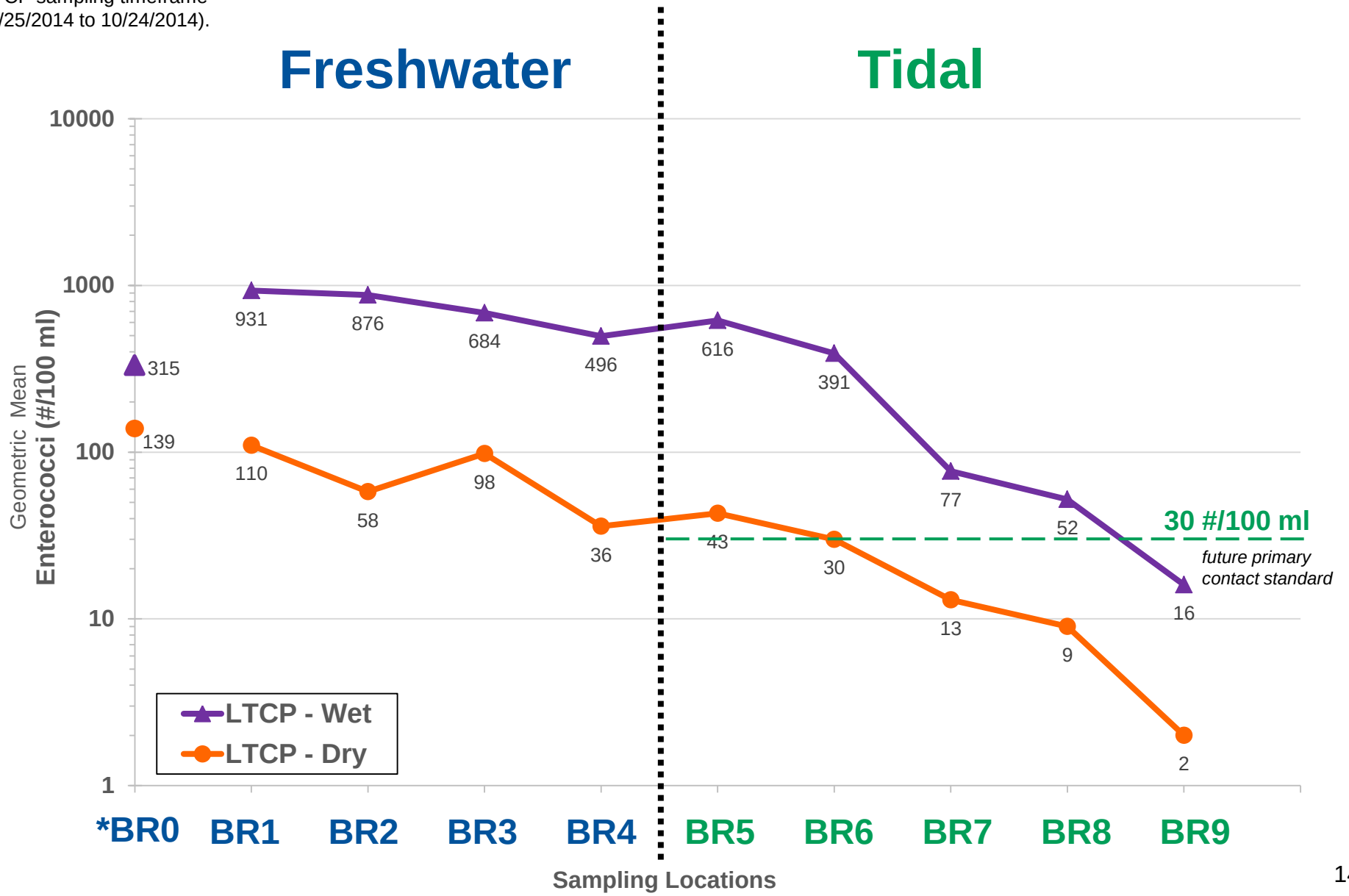
May 17th, 2014 to July 17th, 2014



Enterococci Sampling Results - GMs

***BR0** county line bi-weekly sampling conducted outside LTCP sampling timeframe (7/25/2014 to 10/24/2014).

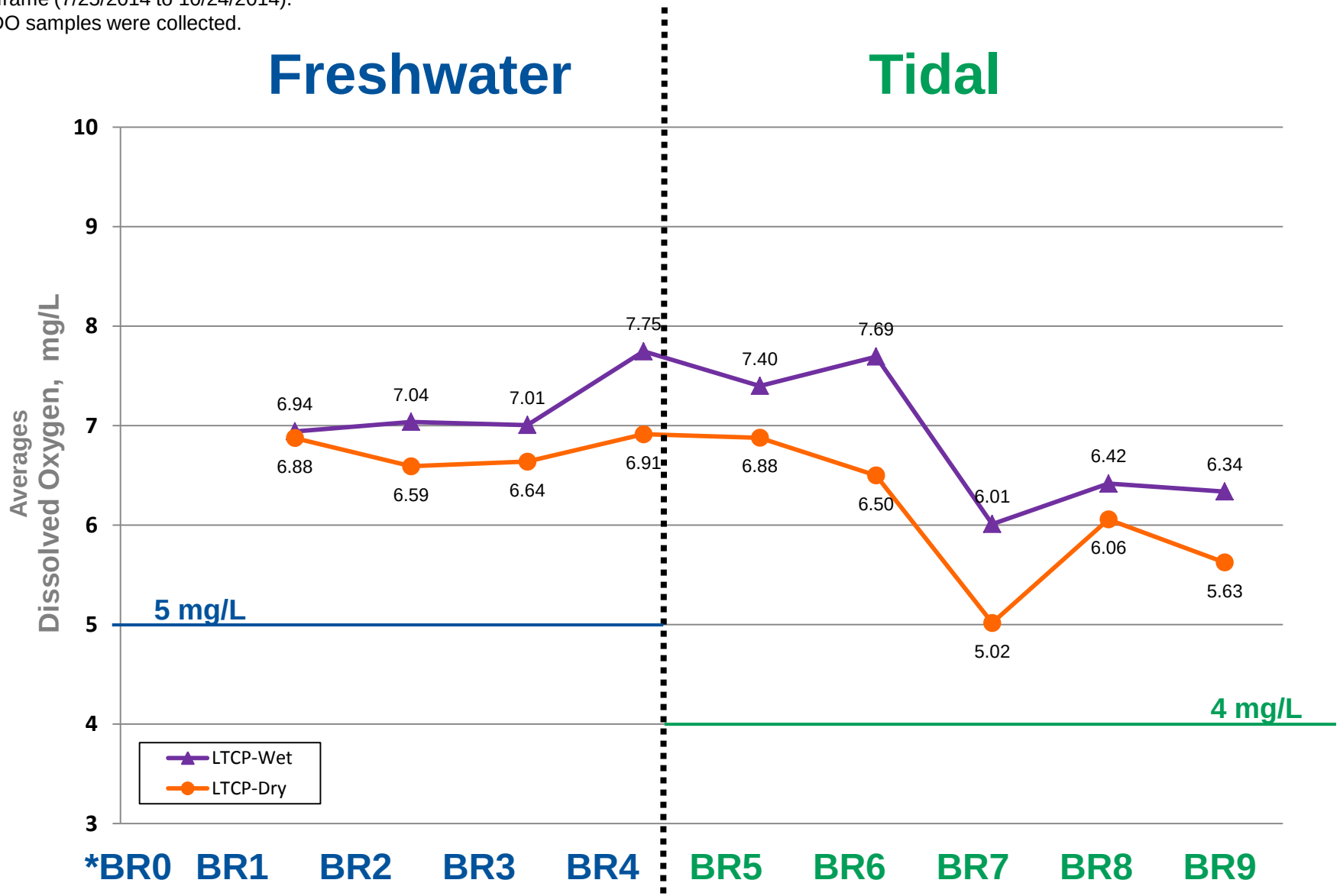
May 17th, 2014 to July 17th, 2014



DO Sampling Results – Averages

***BR0** county line bi-weekly sampling conducted outside LTCP sampling timeframe (7/25/2014 to 10/24/2014). No DO samples were collected.

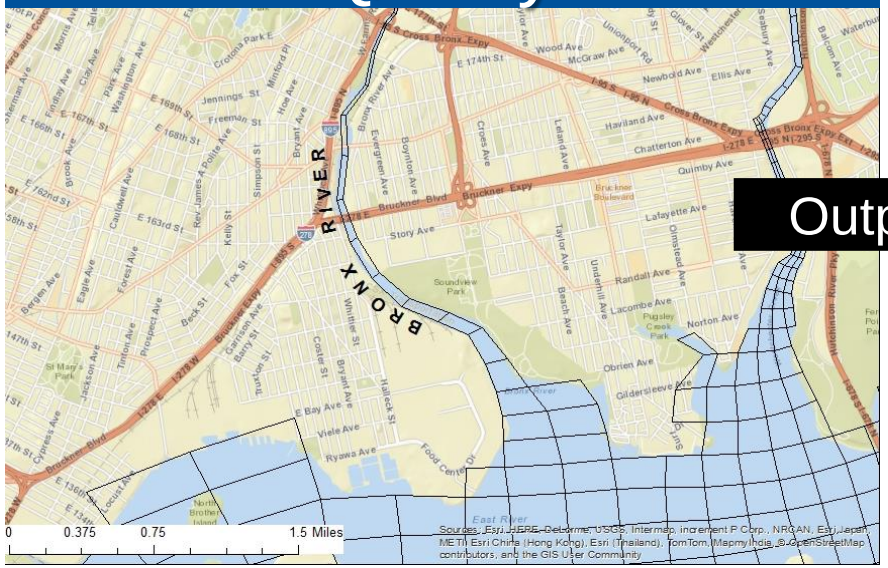
May 17th, 2014 to July 17th, 2014



WQ Attainment Summary

Sampling Data

Water Quality Model



Output

Based on Model Results:

No difference in annual attainment between Baseline and 100% CSO Control*.

All 100% **Seasonal Fecal**
(Monthly GM ≤ 200 col/100 ml)

83% to 100% **Annual Fecal**
(Monthly GM ≤ 200 col/100 ml)

61% to 100% **Annual Enterococcus**
(30-d rolling GM ≤ 30 col/100 ml)

93% to 100% **Dissolved Oxygen**
(Never less than 4.0 mg/L)
(Daily Average > 5.0 mg/L)

*Range based on results across 9 sampling locations (BR1 to BR9).

Assumptions:
- Westchester County flows are in attainment
- 2008 rainfall year

Water Quality Improvement Projects
Green and Grey Infrastructure

Mikelle Adgate
Project Manager
DEP

Jim Mueller, P.E.
Assistant Commissioner
DEP

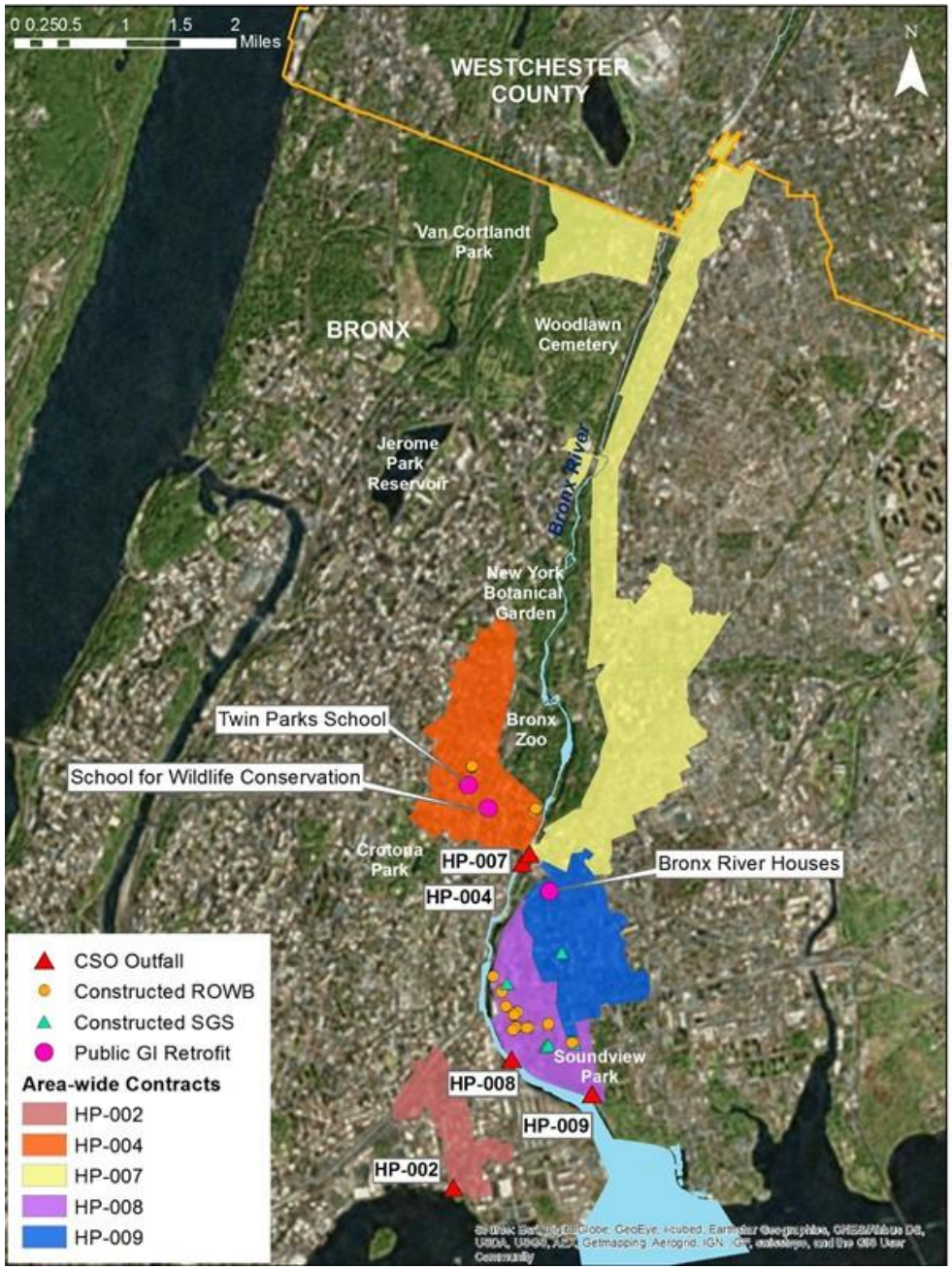
GI Projects in Bronx River Watershed

Built Green Infrastructure:

- 23 bioswales and 8 stormwater greenstreets constructed to date in HP-008 and HP-009
- Bronx River Houses - NYCHA
- Shoelace Park - DPR

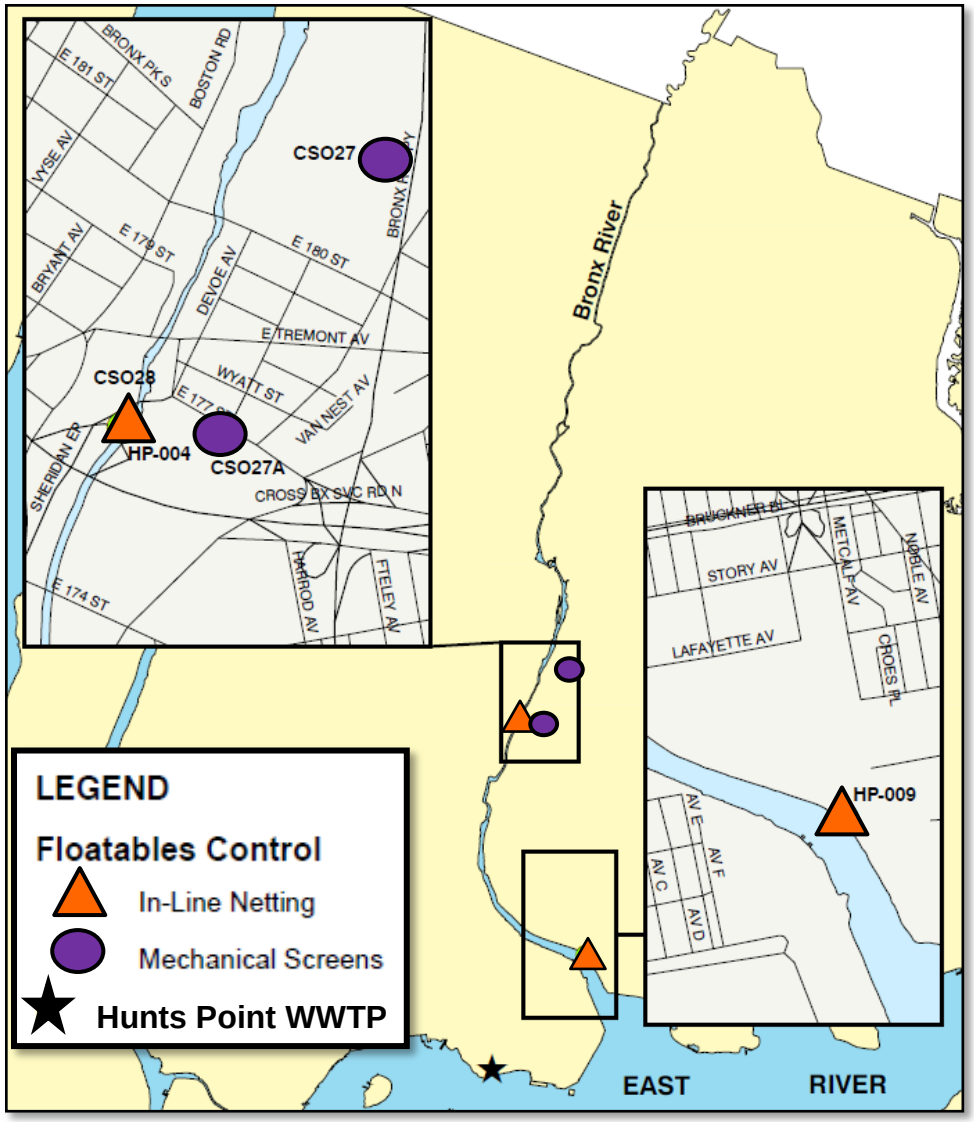
Planned Projects:

- Area-Wide Contracts:
  - Design will begin in HP-002, HP-004 and HP-007 in 2015
- Partnership with TPL/SCA/DOE:
  - P.S. 129 (in construction)
- Partnership with DPR:
  - Watson Gleason Playground
- GI Grant Program:
  - ~$1 M renovation of a Bronx Zoo parking lot with rain gardens and porous paving



Grey Infrastructure Installed in Bronx River

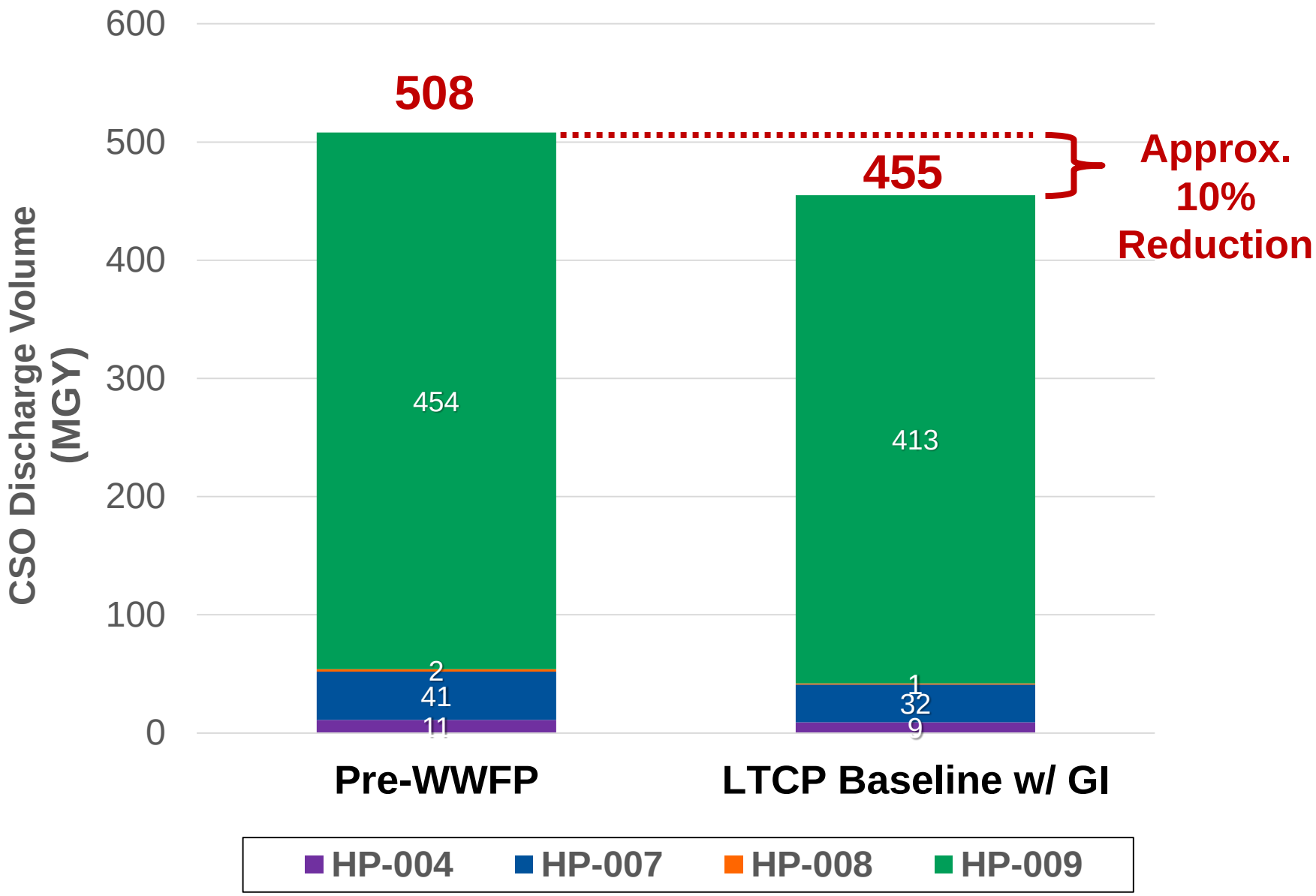
- **Floatables Control**
  - **In-Line Netting Facilities**
    at CSO Outfalls HP-004 & HP-009
  - **Mechanical Screens**
    at Regulators CSO27 & 27A
    - **Floatables Boom**
      by Concrete Park
      - ✓ CY2014: Bronx River had 415 cubic yard of floatables removed. Significant amount of tree branches.
- Construction Cost ~ $47M
- Completed in June 2012



Additional CSO Reduction Alternatives Evaluation

Jim Mueller, P.E.
Assistant Commissioner
DEP

Modeled Bronx River CSO Volumes

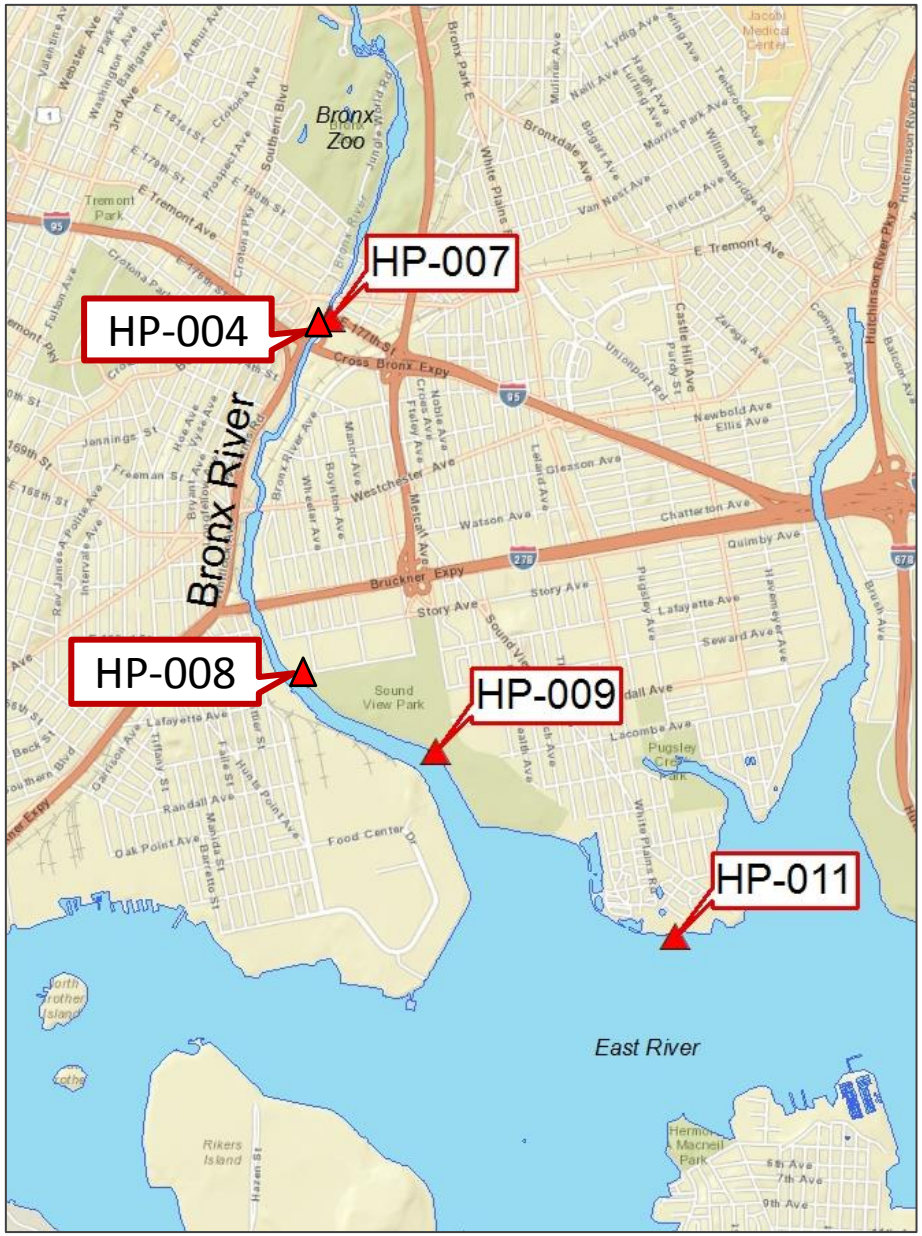


Alternatives Overview

- Evaluate Alternatives for Bronx River Outfalls:
  - **HP-009**
  - **HP-007**

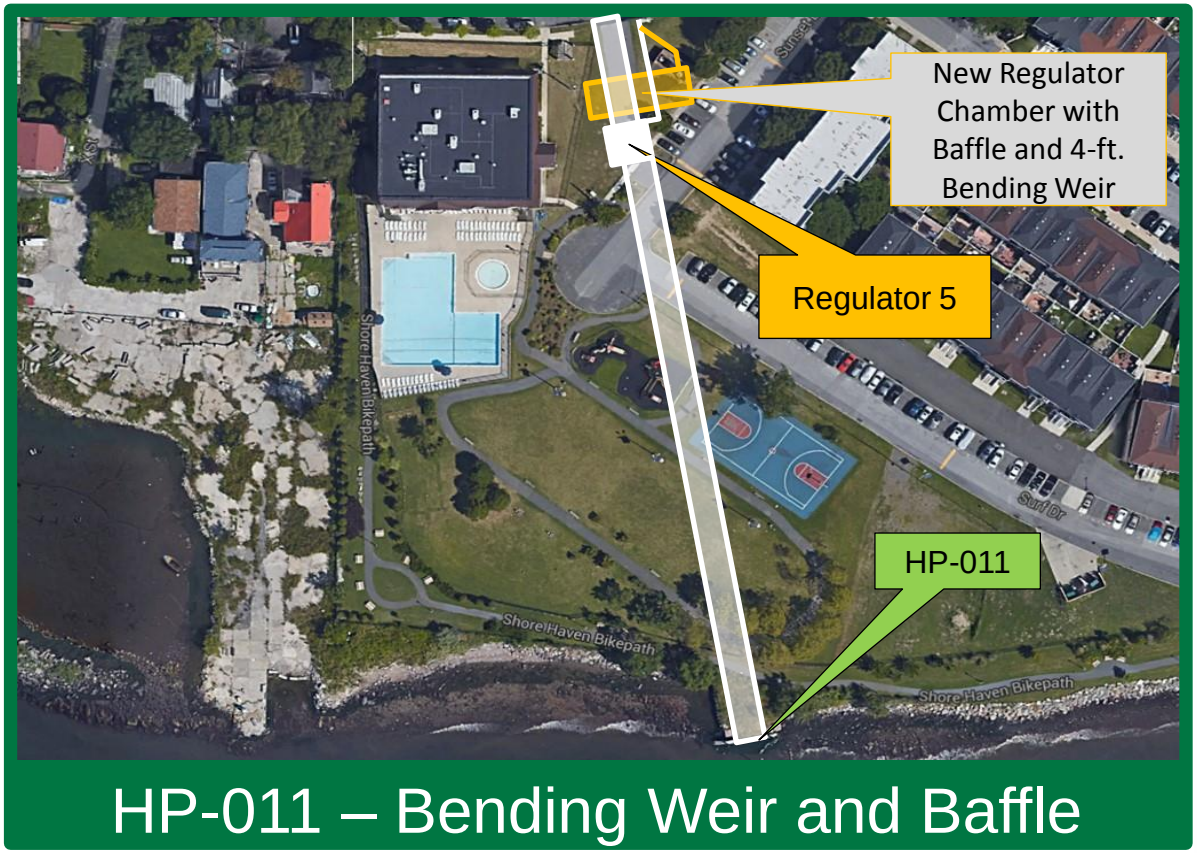
  Target Outfalls with Largest CSO Discharges
  - HP-008
  - HP-004
- Evaluate Floatables Control for East River Outfall:
  - HP-011

Alternatives developed based on **combinations of different technology options** at target outfalls



HP-011 Bending Weir and Baffle

- 4-ft bending weir and baffle at Regulator 5



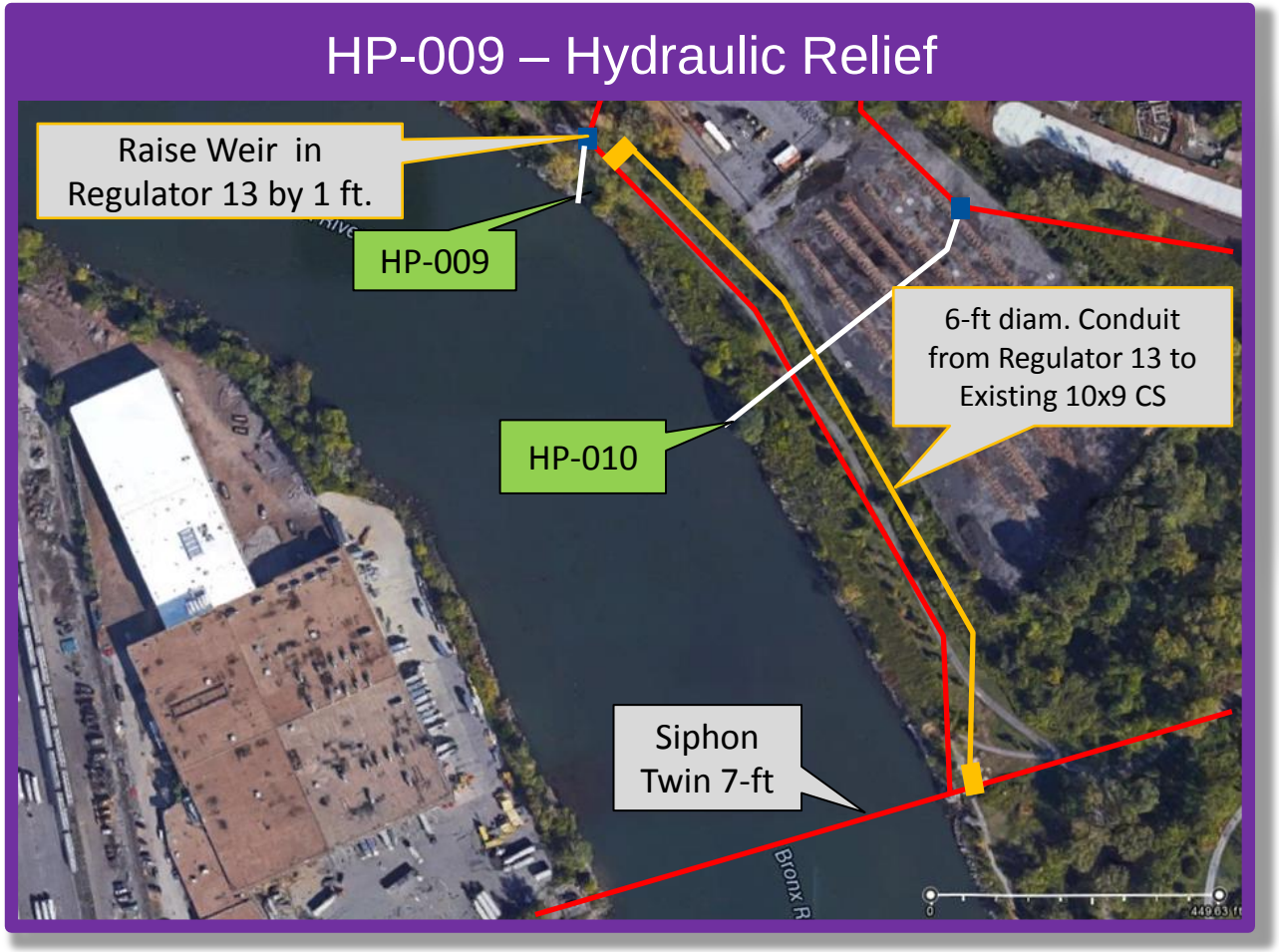
HP-011 – Bending Weir and Baffle

Bending Weirs

Baffle

HP-009 Hydraulic Relief

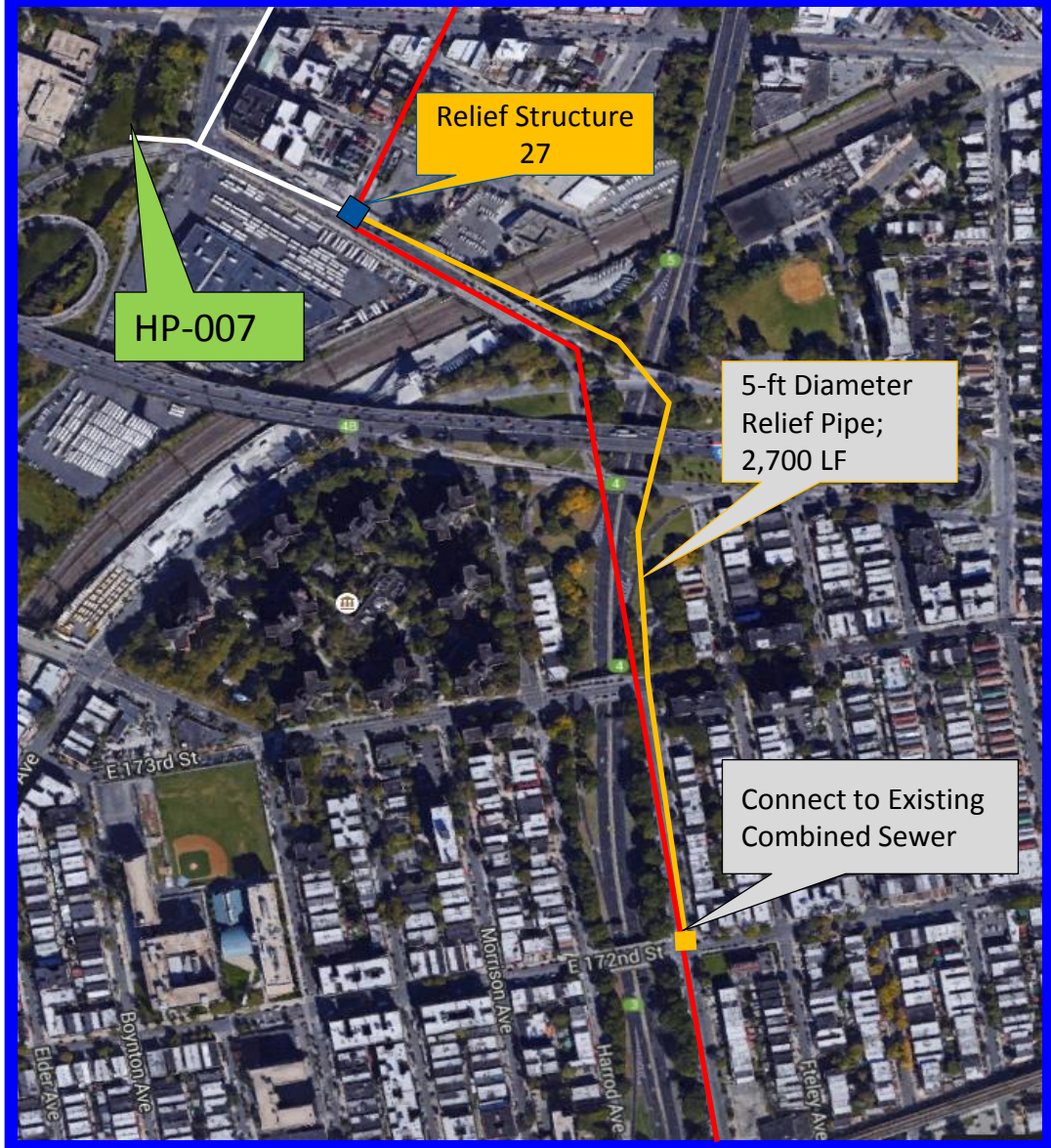
- Raise weir at Regulator 13
- Relief pipe between Regulator 13 and Bronx River siphon




Hydraulic Relief

HP-007 Hydraulic Relief

HP-007 – Hydraulic Relief



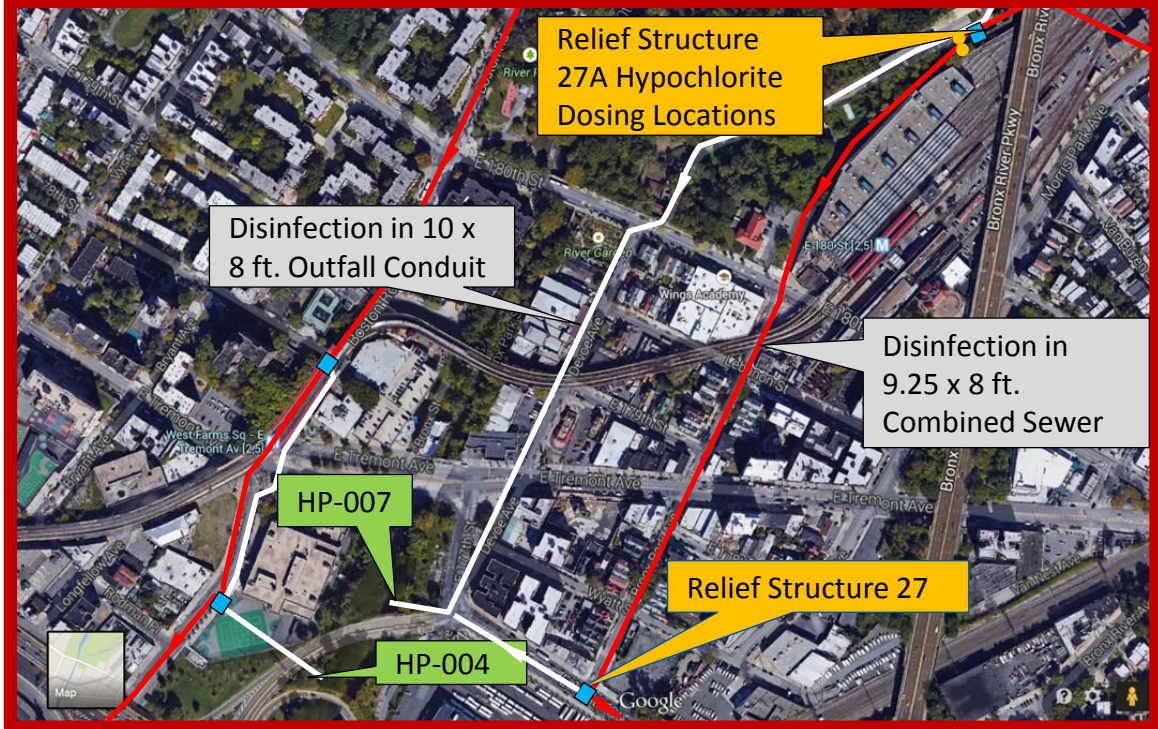
- 5-ft diameter relief pipe
- 2,700 linear feet
- Connect to existing combined sewer

Hydraulic Relief

HP-007 Disinfection

- Hypochlorite Dosing at Relief Structure 27A
- Disinfection in 10 x 8 ft. Outfall Conduit
- Disinfection in 9.25 x 8 ft. Combined Sewer

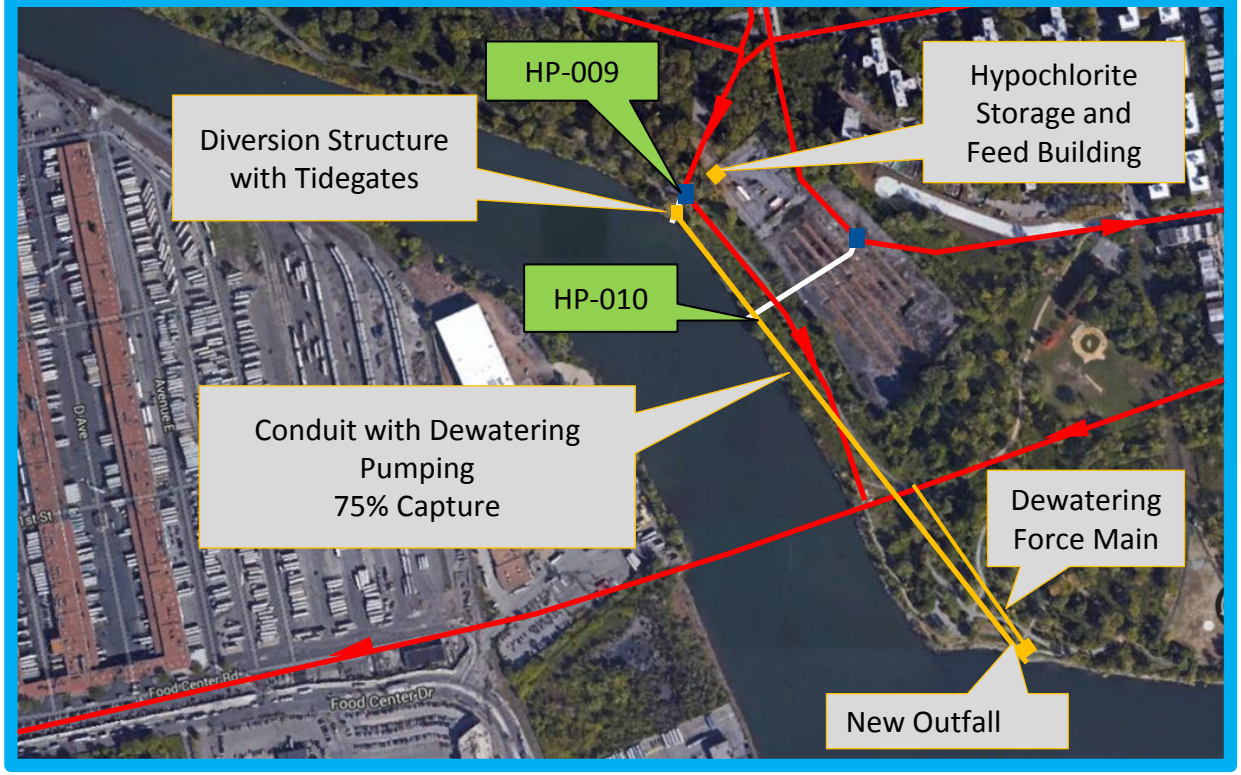
HP-007 – Disinfection



HP-009 Outfall Conduit Disinfection

- Diversion structure with tide gates
- 1,900 LF 9ft. diameter conduit with dewatering pumping

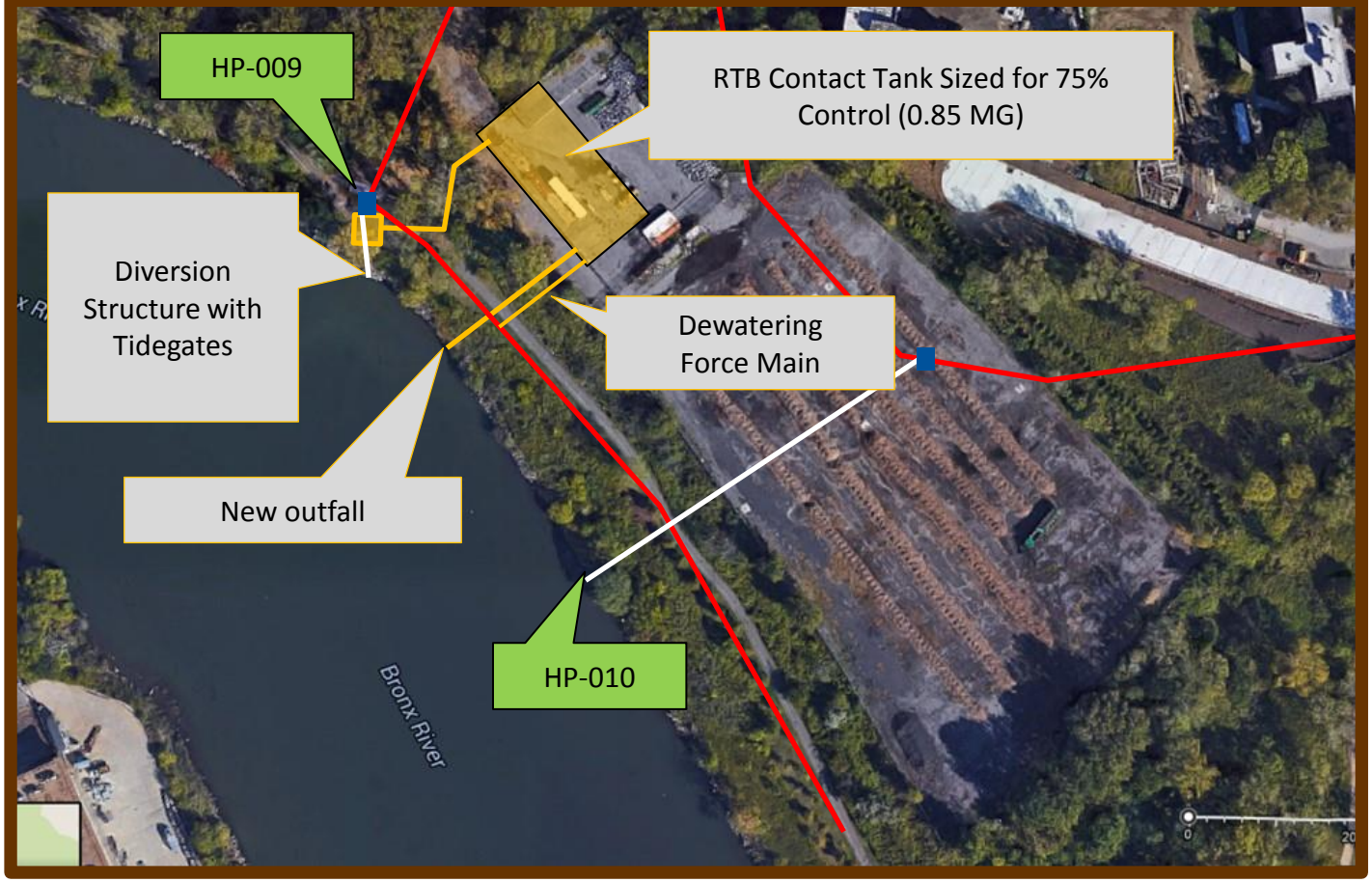
HP-009 – Outfall Conduit Disinfection



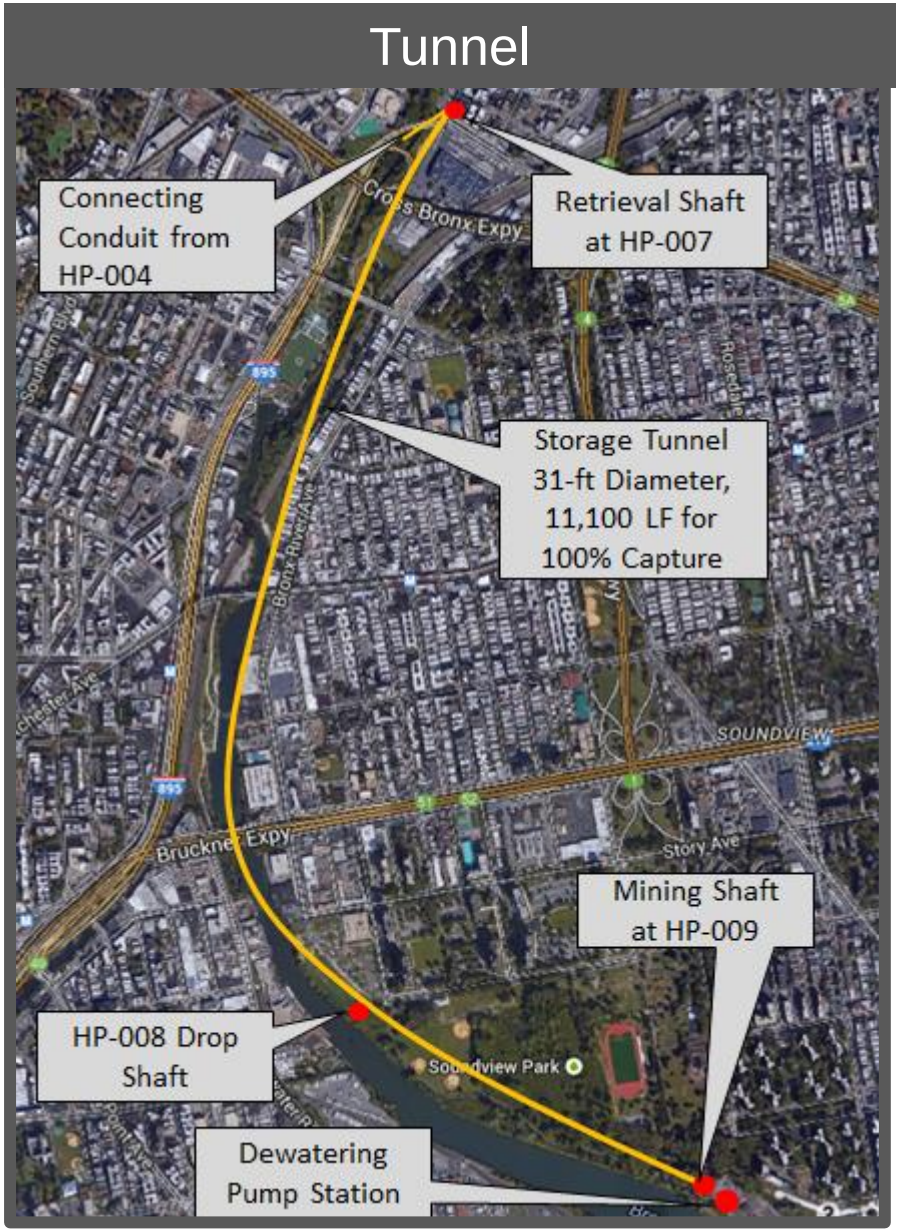
HP-009 RTB Contact Tank Disinfection

- RTB Contact Tank Sized for 75% Control
- New Outfall

HP-009 – RTB Contact Tank Disinfection



Tunnel



100% Capture of CSO from outfalls HP-004, HP-007, HP-008 and HP-009:

- 61 MG Tunnel
  - 31-ft Diameter
  - 11,100 Linear Feet
  - 30.5 MGD Dewatering Pump Station

Evaluation of Six Alternatives

➢ Alternatives developed based on **combinations of different technology options** at target outfalls:

Alt. #	HP-011	HP-009	HP-007	HP-008	HP-004
1	Bending Weir & Baffle	Hydraulic Relief	--	--	--
2	Bending Weir & Baffle	Hydraulic Relief	Hydraulic Relief	--	--
3	Bending Weir & Baffle	Hydraulic Relief	Disinfection	--	--
4	Bending Weir & Baffle	Outfall Conduit Disinfection	Disinfection	--	--
5	Bending Weir & Baffle	RTB Contact Tank Disinfection	Disinfection	--	--
6	Bending Weir & Baffle	Tunnel	Tunnel	Tunnel	Tunnel

Time to Recover

Station	Time to Recover to 1,000 cfu/100 ml FC (Hours)						
	Baseline	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
BR5	27	27	27	27	27	27	27
BR6	23	23	23	22	19	19	15
BR7	21	21	21	18	14	14	13
BR8	14	15	15	12	11	11	11
BR9	4	3	3	3	3	3	2

Based on August 15, 2008 Storm, using JFK rainfall

Summary of Benefits & Costs

Alt. #	Technology Combinations	Total CSO Volume (MGY)	% CSO Volume Disinfected	%CSO Volume Reduction	%Bacteria Load Reduction	Total NPV Cost ($ Million)
--	**LTCP Baseline with GI**	455	--	--	--	--
1	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief	295	--	35%	35% Seasonal 35% Annual	$41
2	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief HP-007: Hydraulic Relief	286	--	37%	37% Seasonal 37% Annual	$111
3	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief HP-007: Disinfection	295	9%	35%	66% Seasonal 40% Annual*	$65
4	HP-011: Bending Weir & Baffle HP-009: Outfall Conduit Disinfection HP-007: Disinfection	437	43%	4%	74% Seasonal 45% Annual*	$153
5	HP-011: Bending Weir & Baffle HP-009: RTB Tank Disinfection HP-007: Disinfection	437	43%	4%	74% Seasonal 45% Annual*	$85
6	HP-011: Bending Weir & Baffle HP-004/007/008/009: Tunnel	--	--	100%	100% Annual	$701

*Annual bacteria load reduction based on no disinfection in non-recreational season.

Summary of Cost Breakdown

Alt. #	Technology Combinations	Capital Cost	Annual O&M	**Total NPV Cost**
1	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief	$40.7 M	$53 K / year	**$41 M**
2	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief HP-007: Hydraulic Relief	$110.7 M	$53 K / year	**$111 M**
3	HP-011: Bending Weir & Baffle HP-009: Hydraulic Relief HP-007: Disinfection	$59.8 M	$381 K / year	**$65 M**
4	HP-011: Bending Weir & Baffle HP-009: Outfall Conduit Disinfection HP-007: Disinfection	$143.8 M	$701 K / year	**$153 M**
5	HP-011: Bending Weir & Baffle HP-009: RTB Tank Disinfection HP-007: Disinfection	$75.6 M	$701 K / year	**$86 M**
6	HP-011: Bending Weir & Baffle HP-004/007/008/009: Tunnel	$660.7 M	$2.75 M / year	**$701 M**

Next Steps

- LTCP Submittal to NYSDEC by June 30, 2015
- Bronx River LTCP Public Meeting # 3, TBD
  - Present and review proposed LTCP
- Comments can also be submitted to:
  - New York City DEP at: ltcp@dep.nyc.gov

Additional Information & Resources

- Visit the informational tables tonight for handouts and poster boards with detailed information

- Go to 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

Discussion and Q&A Session