



Citywide/Open Waters

CSO Long Term Control Plan

Stakeholder Meeting

The CUNY School of Law Auditorium

April 16, 2019

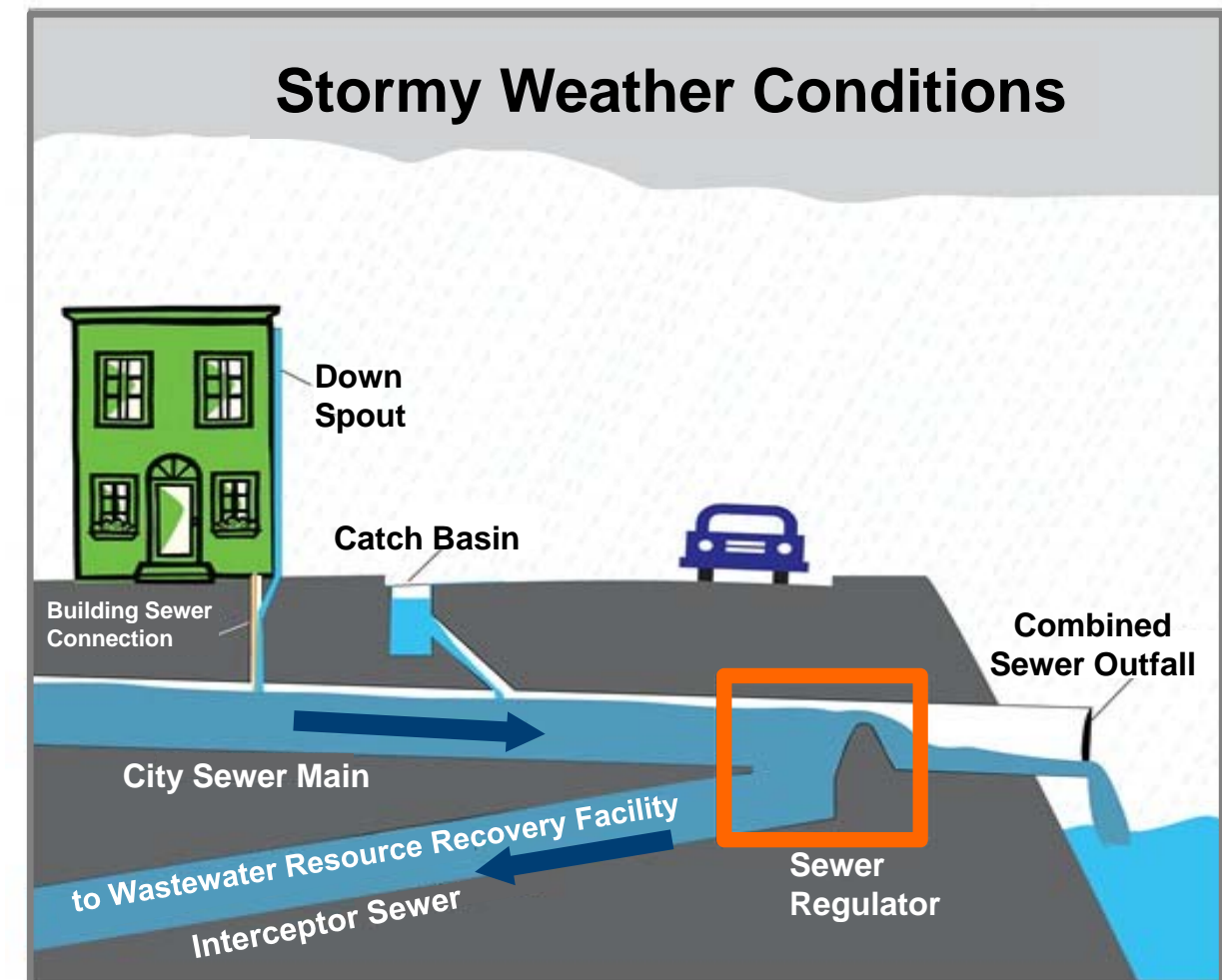
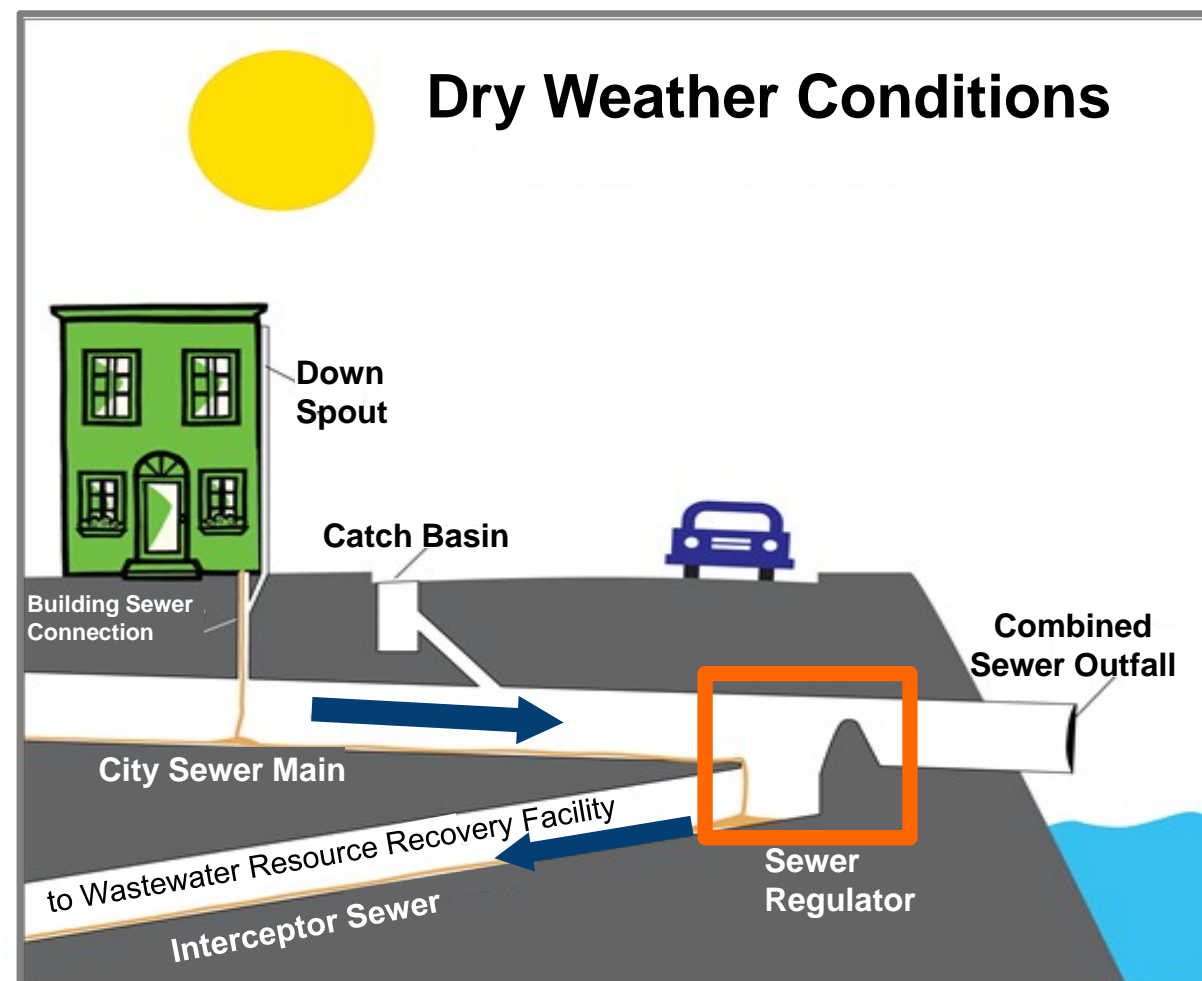
Topic	Speaker
1 Welcome & Introduction	Mikelle Adgate
2 Overview of Progress	Keith Mahoney, PE Pinar Balci, PhD
3 Next Steps	Mikelle Adgate

Welcome & Introduction

Mikelle Adgate
Senior Advisor, BPAC
DEP

What is a Combined Sewer Overflow (CSO)?

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



- 65% to 90% of **combined** sanitary & storm flow is captured at treatment plants.
- When the sewer system is at full capacity, a diluted mixture of rain water and sewage may be released into local waterways. This is called a combined sewer overflow (CSO).

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

CSO Consent Order

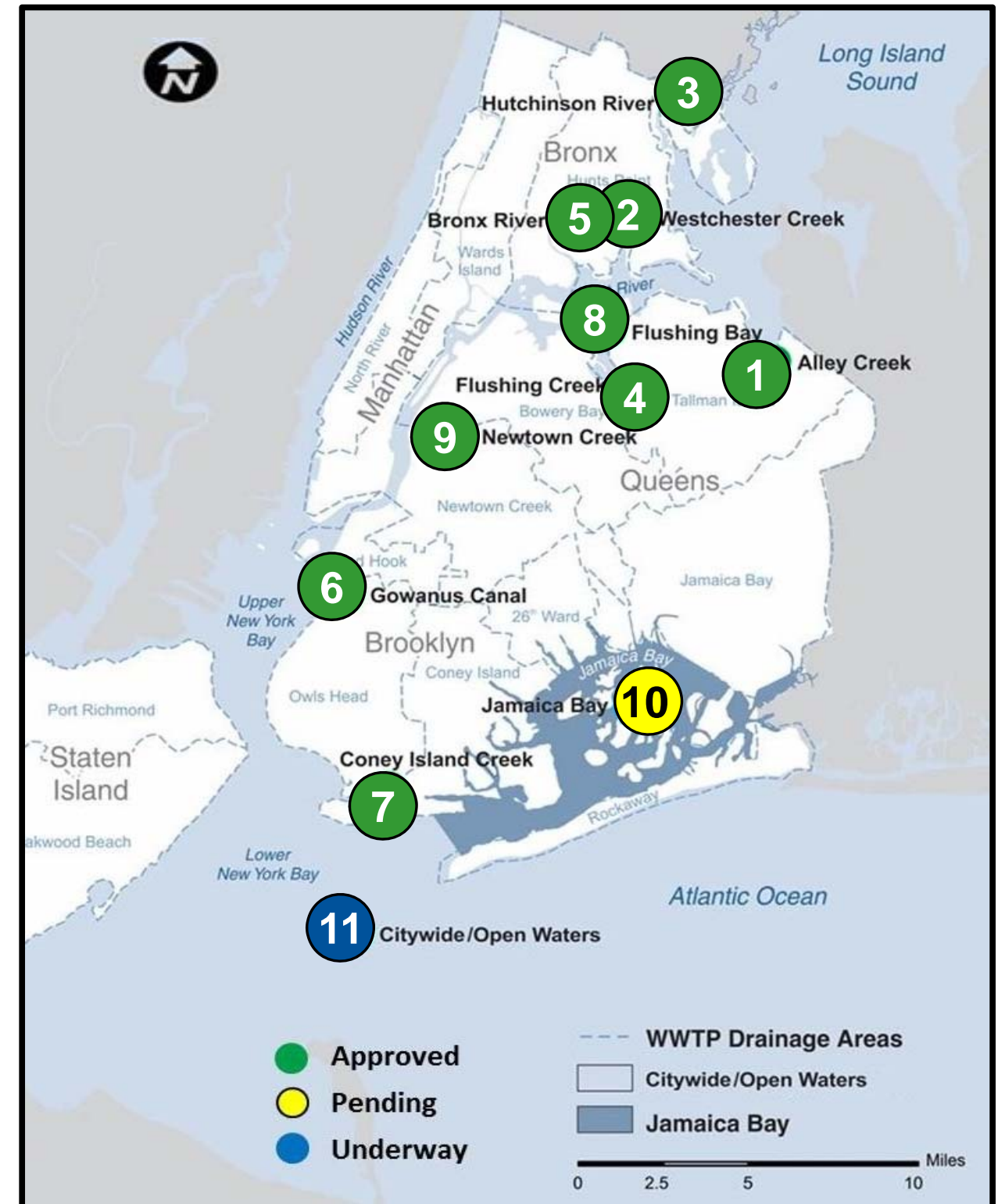
an agreement between NYC and DEC that settles past legal disputes without prolonged litigation

DEC requires DEP to develop LTCPs and mitigate CSOs

LTCP Milestone Status

ID	LTCP	Approved?
1	Alley Creek	✓
2	Westchester Creek	✓
3	Hutchinson River	✓
4	Flushing Creek	✓
5	Bronx River	✓
6	Gowanus Canal	✓
7	Coney Island Creek	✓
8	Flushing Bay	✓
9	Newtown Creek	✓
10	Jamaica Bay and Tributaries ⁽¹⁾	Under DEC review
11	Citywide/Open Waters ⁽²⁾	LTCP in development Due to DEC March 2020

- (1) Jamaica Bay includes Thurston Basin, Bergen Basin, Hendrix Basin, Fresh Creek, Spring Creek, Paerdegat Basin and Jamaica Bay
- (2) Citywide/Open Waters LTCP includes East River, Lower Long Island Sound, Hudson River, Harlem River, Lower and Upper New York Bay, Arthur Kill and Kill Van Kull

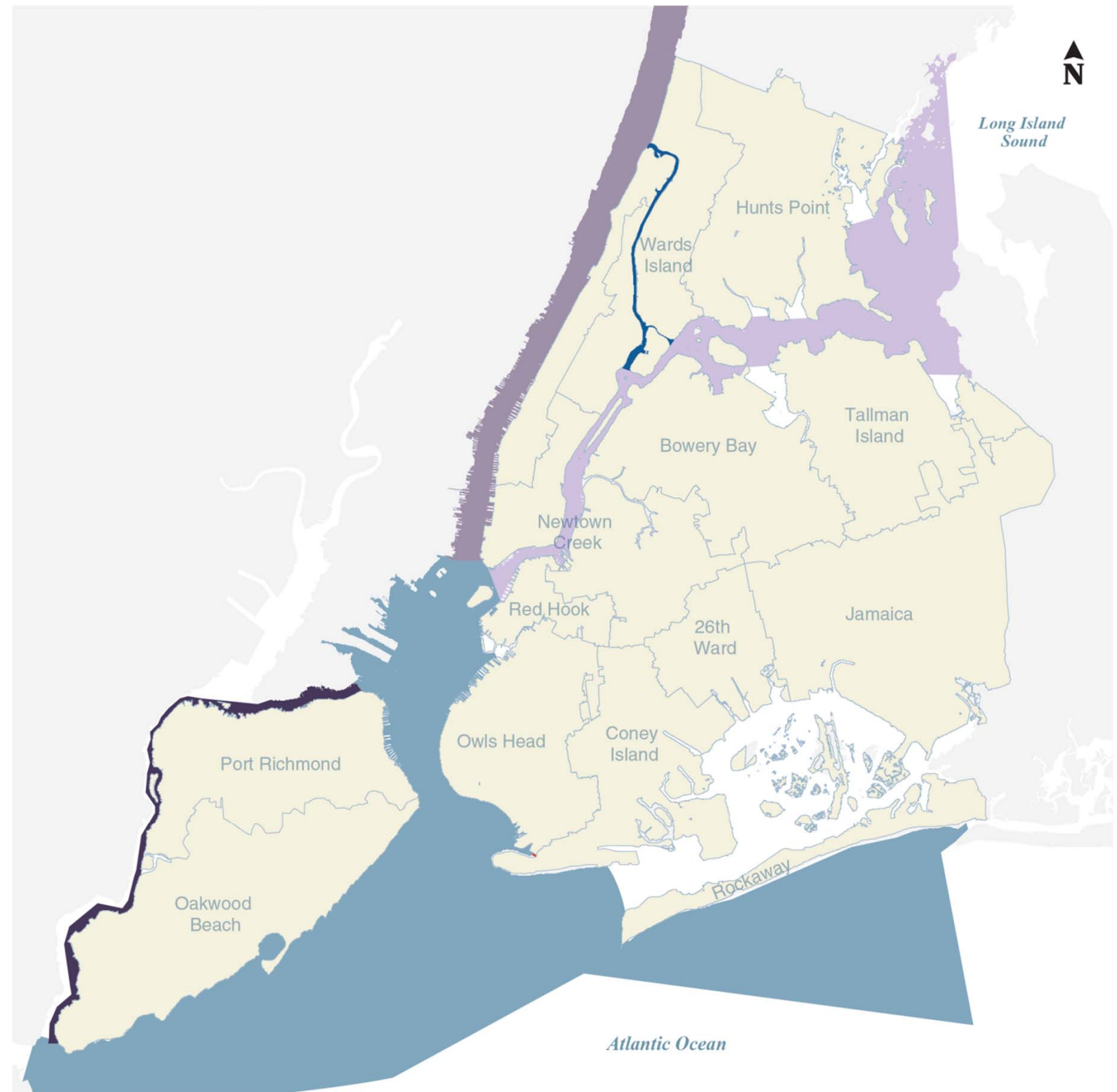


Citywide/Open Waters LTCP

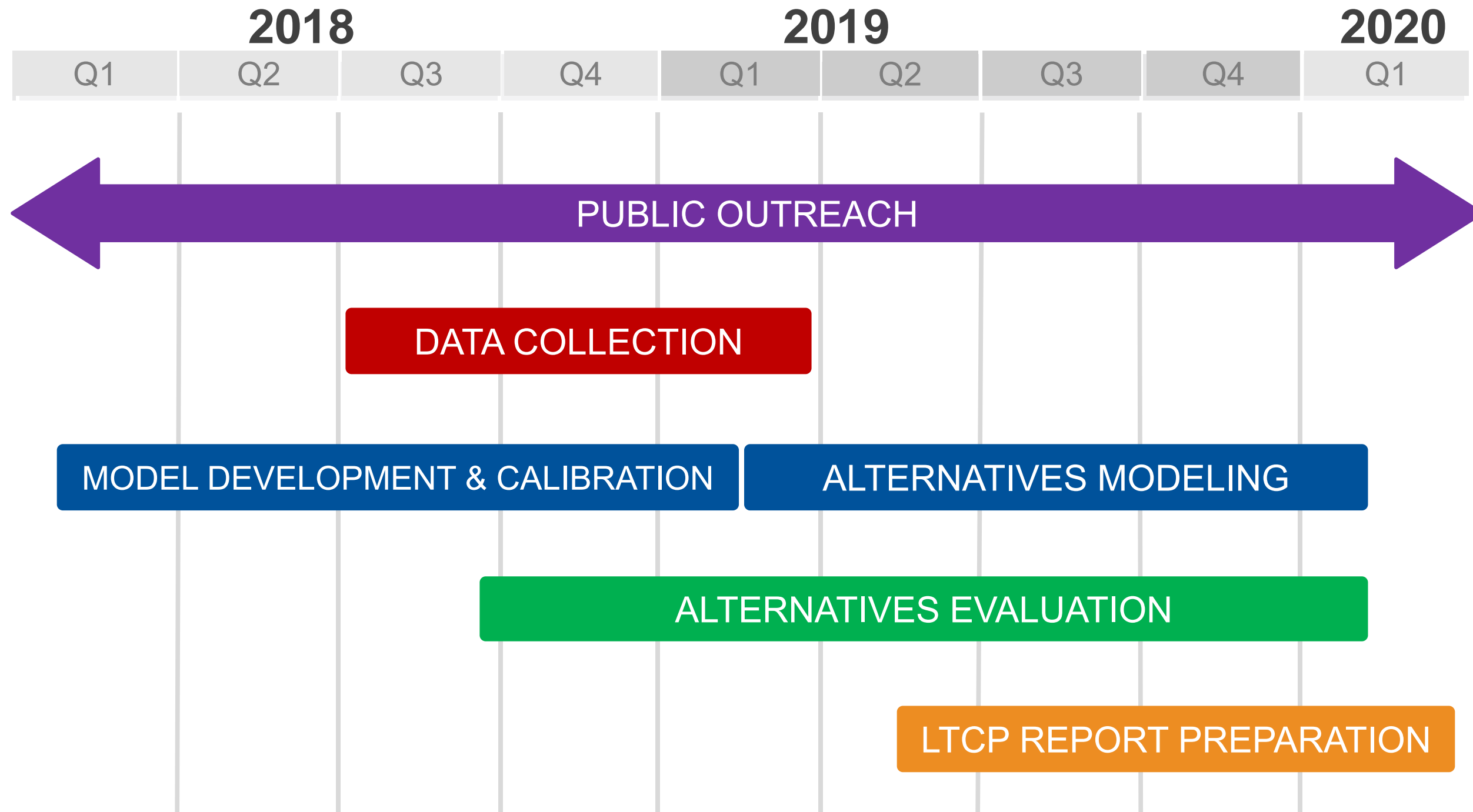
- Waterbody-specific CSO evaluation of Open Waters:

- Harlem River
- Upper and Lower New York Bay
- East River/Long Island Sound
- Hudson River
- Arthur Kill and Kill Van Kull

- Citywide/Open Waters LTCP will be submitted to DEC in **March 2020**

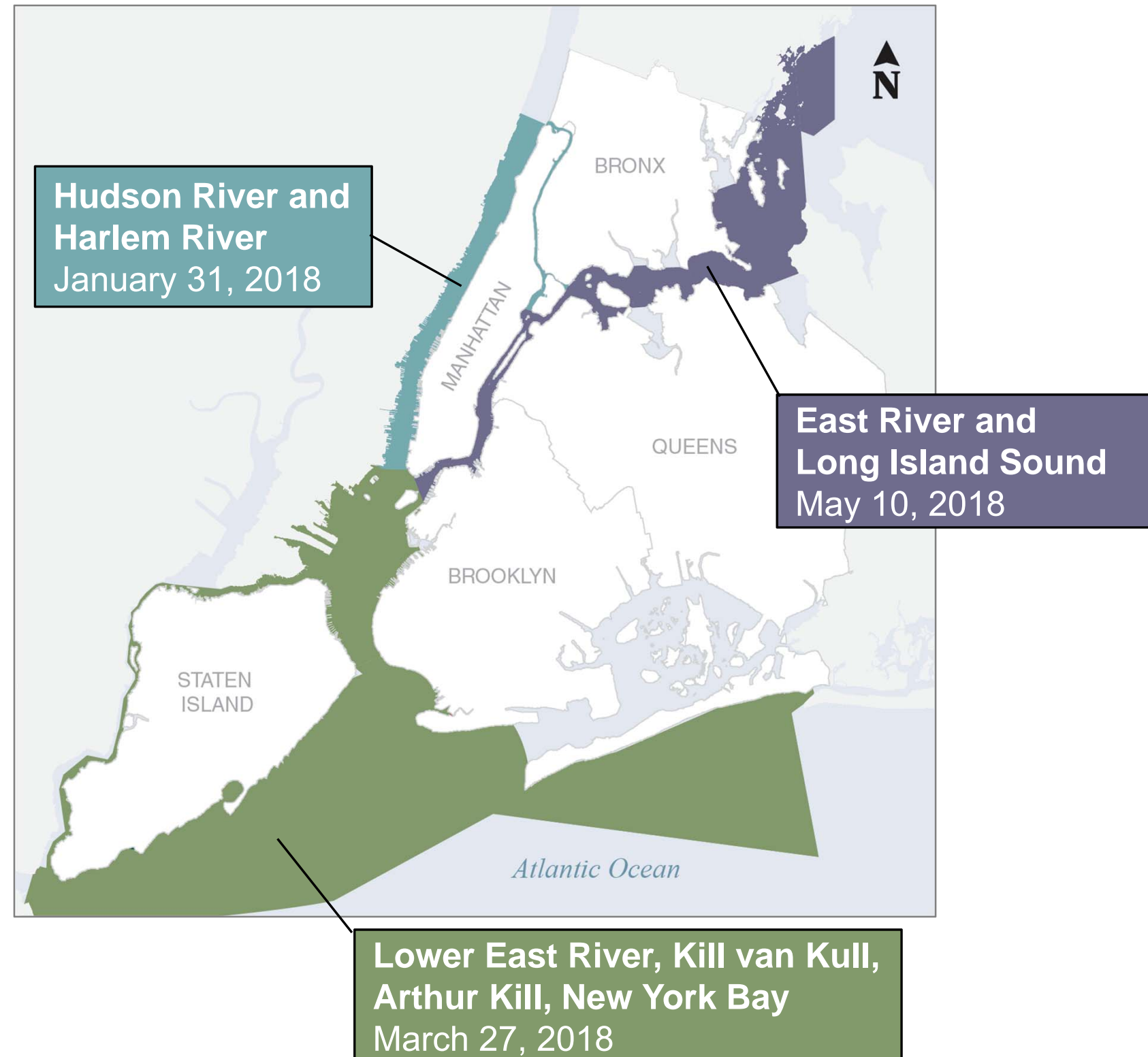


Overview of LTCP Progress

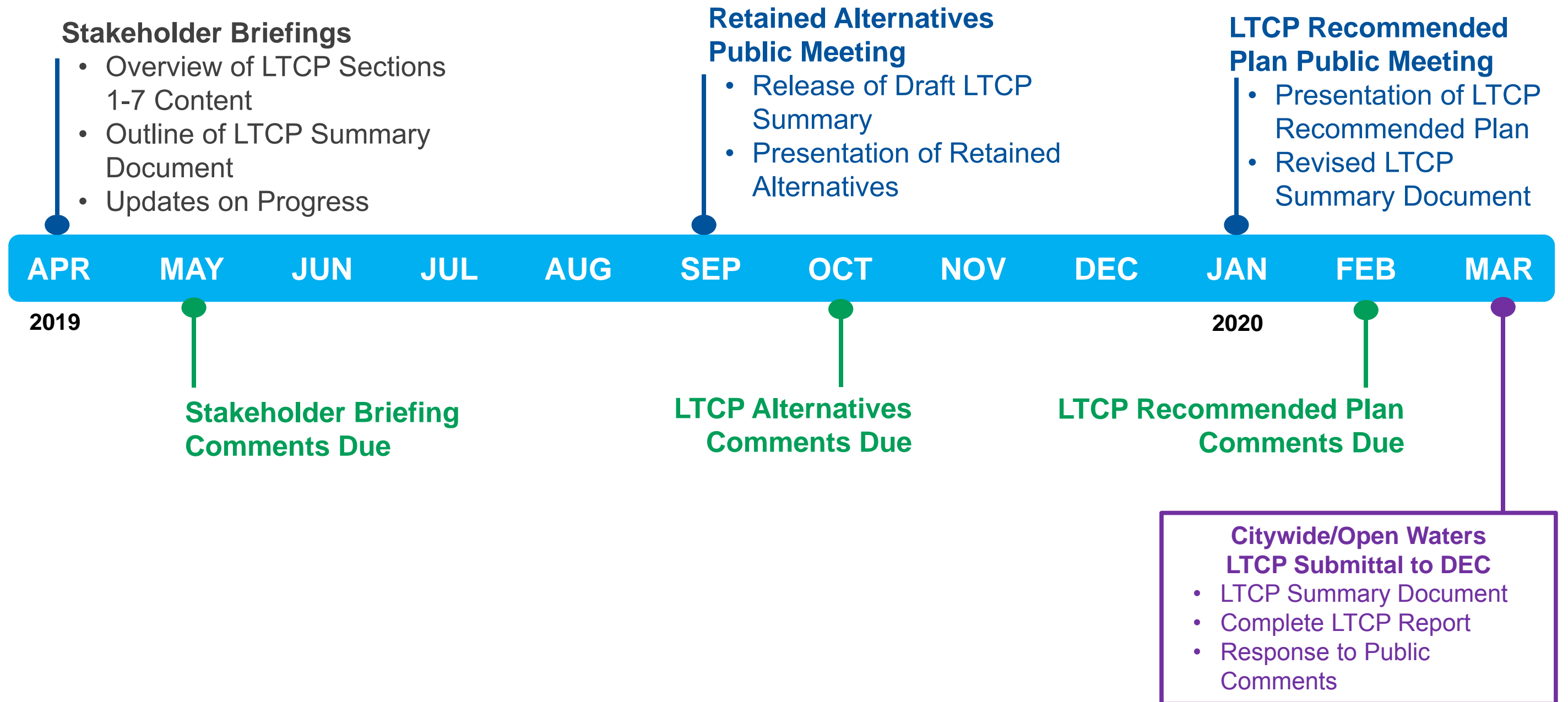


Public Outreach Update

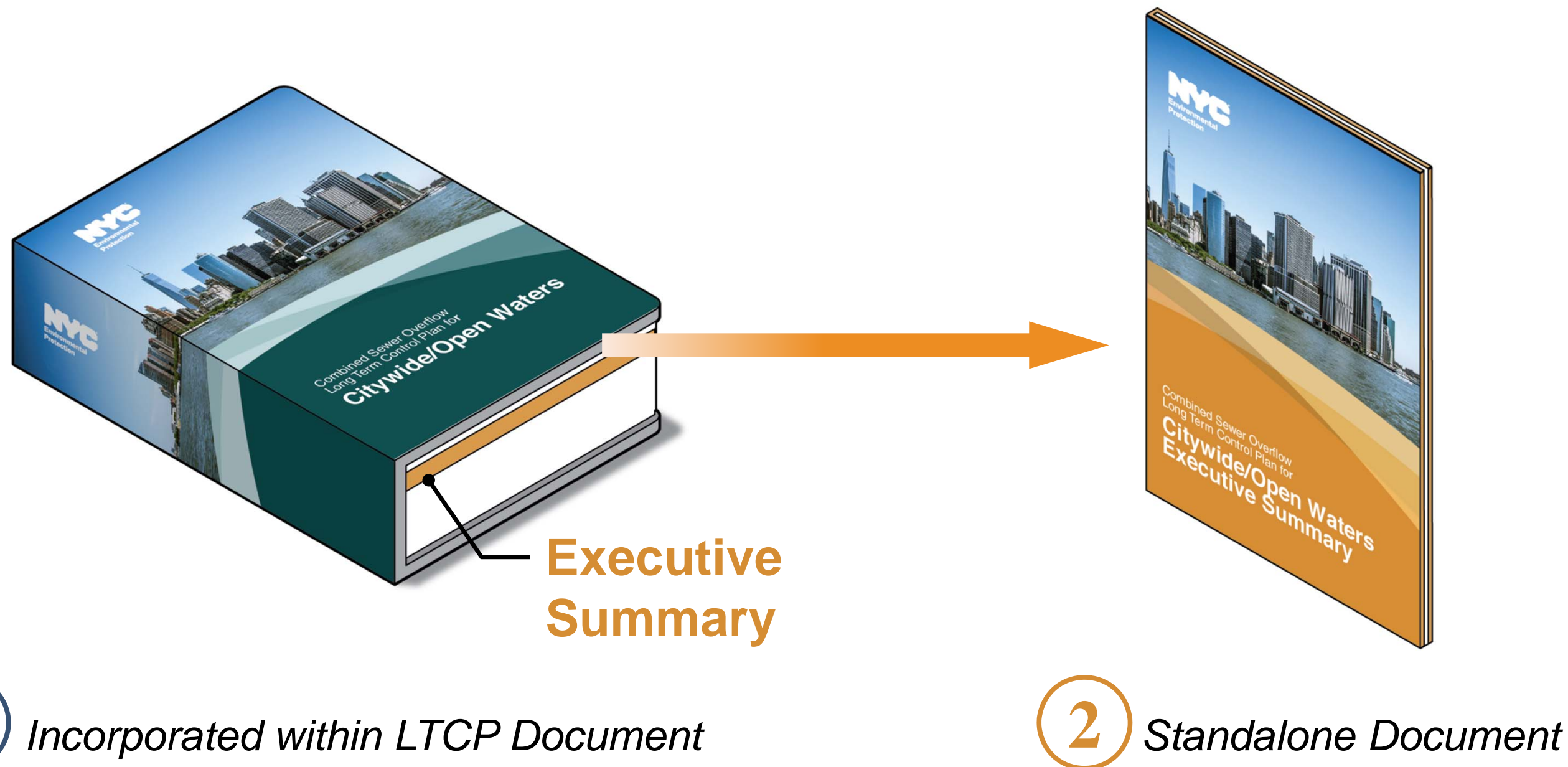
- Held three kick-off meetings
- Presentations are available at: nyc.gov/dep/ltcp
- Presentations covered:
 - Waterbody and watershed characteristics and water quality sampling
 - Existing and planned water quality improvement projects
 - LTCP modeling and alternatives development process



Citywide/Open Waters Schedule



The Executive Summary will be **distributed in two formats, but content will be identical:**



The table of contents will be **compliant with DEC's requirements**, containing all sections in the sequence stipulated by DEC.



EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1-1
2.0 WATERSHED/WATERBODY CHARACTERISTICS	2-1
3.0 CSO BEST MANAGEMENT PRACTICES	3-1
4.0 GREY INFRASTRUCTURE	4-1
5.0 GREEN INFRASTRUCTURE	5-1
6.0 BASELINE CONDITIONS AND PERFORMANCE GAP	6-1
7.0 PUBLIC PARTICIPATION AND AGENCY COORDINATION	7-1
8.0 EVALUATION OF ALTERNATIVES	8-1
9.0 LONG-TERM CSO CONTROL PLAN IMPLEMENTATION	9-1
10.0 REFERENCES	10-1
11.0 GLOSSARY	11-1
APPENDICES	

Structure of Executive Summary

However, the Executive Summary will be structured differently. We plan to group sections that **apply to all waterbodies first.**



EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION	1-1
2.0 WATERSHED/WATERBODY CHARACTERISTICS	2-1
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Structure of Executive Summary

Next, we will group sections with information unique to each waterbody into **specific waterbody snapshots.**



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11.0 GLOSSARY	11-1
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Structure of Executive Summary

So the structure of the Executive Summary will look like this:



Executive Summary	
APPLIES TO ALL WATERBODIES	
INTRODUCTION	X-X
CSO BEST MANAGEMENT PRACTICES	X-X
GREY INFRASTRUCTURE	X-X
GREEN INFRASTRUCTURE	X-X
BASELINE CONDITIONS	X-X
PUBLIC PARTICIPATION AND AGENCY COORDINATION	X-X
SPECIFIC WATERBODY SNAPSHOTS	
WATERSHED/WATERBODY CHARACTERISTIC	X-X
PERFORMANCE GAP	X-X
EVALUATION OF ALTERNATIVES	X-X
LONG TERM CSO CONTROL PLAN IMPLEMENTATION	X-X

Sample Introduction Spread



1. Introduction

Background/Goals

In 2005 New York City (NYC) and the Department of Environmental Conservation (DEC) entered into a Combined Sewer Overflow (CSO) Consent Order (DEC Case No: CO2-20000107-8), as modified and collectively referred to as the "CSO Order," to address CSOs in NYC. Among other requirements, the CSO Order requires DEP to evaluate and to implement CSO abatement strategies on an enforceable timetable for long term CSO control. Pursuant to the CSO Order, DEP is required to submit 10 waterbody-specific Long Term Control Plans (LTCPs) and one citywide LTCP to DEC for review and approval. DEC is the regulatory agency reviewing and approving these LTCPs based on their compliance with the water quality goals of the Federal Clean Water Act, the State Environmental Conservation Law and EPA's CSO Control Policy.

Long Term Control Plan

identifies appropriate CSO controls to achieve applicable water quality standards consistent with the federal CSO Policy and Clean Water Act.

CSO Consent Order

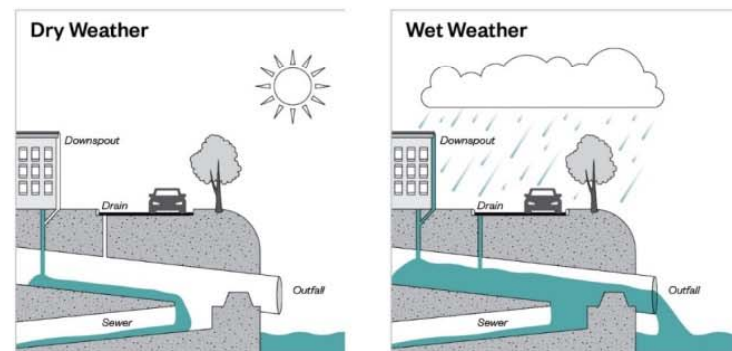
an agreement between NYC and DEC that settles past legal disputes without prolonged litigation. DEC requires DEP to develop LTCPs and mitigate CSOs.



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 may be released into the local waterways. This is called a combined Sewer Overflow (CSO).



Citywide/Open Waters LTCP Areas

- Harlem River
- Upper and Lower New York Bay
- East River/Long Island Sound
- Hudson River
- Arthur Kill and Kill Van Kull

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Causes of Impairment

- Floatables
- DO and Floatables
- DO and Nitrogen
- Pathogens
- Not Listed as Impaired

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Saline Surface Water Quality Standards

- SA
- SB
- I
- SD

Class	Bacteria			Dissolved Oxygen
	Total Coliform	Fecal Coliform	Entero	
SA	Median ≤ 70 MPN/100mL	-	GM ≤ 35/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
SB	Monthly Median ≤ 2,400/100mL 20% ≤ 5,000/100mL	Monthly GM ≤ 200/100mL	GM ≤ 35/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
I	Monthly Median ≤ 2,400/100mL 80% ≤ 5,000/100mL	Monthly GM ≤ 200/100mL	-	≥ 4.0 mg/L
SD	Monthly Median ≤ 2,400/100mL 80% ≤ 5,000/100mL	Monthly GM ≤ 200/100mL	-	≥ 3.0 mg/L

Sample Waterbody Specific Spread

Harlem River



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Harlem River

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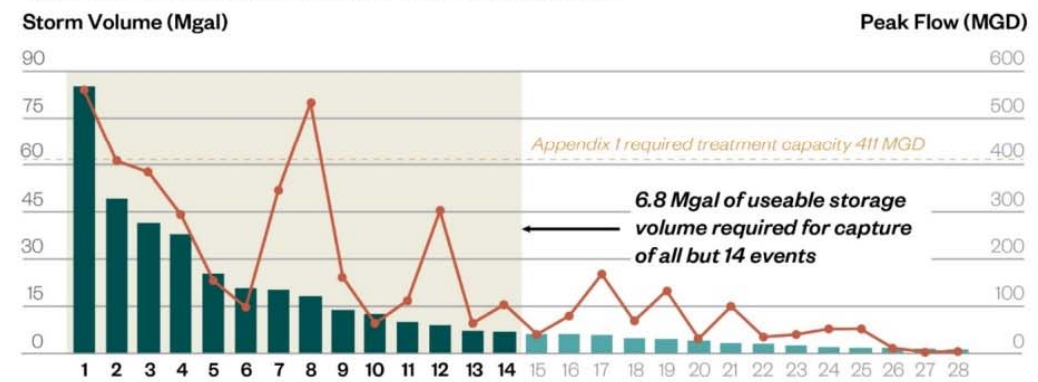
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Typical Year Storm Volumes and Peak Discharge Rates*



*Data based on most recently revised simulations of Westerly collection system and tunnel

Overview of Progress

Keith Mahoney, PE and Pinar Balci, PhD
DEP

Current Water Quality Standards

New York State Saline Surface Water Quality Standards				
Class	Bacteria			Dissolved Oxygen
	Total Coliform	Fecal Coliform	<i>Enterococcus</i> ⁽¹⁾	
SA	Median ≤ 70 MPN/100mL	-	GM ≤ 35/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
SB	Monthly Median ≤ 2,400 cfu/100mL 80% ≤ 5,000 cfu/100mL	Monthly GM ≤ 200/100mL	GM ≤ 35/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
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SD	Monthly Median ≤ 2,400 cfu/100mL 80% ≤ 5,000 cfu/100mL	Monthly GM ≤ 200/100mL	-	≥ 3.0 mg/L

Notes:

(1) Applicable to coastal recreational waters only



Proposed Water Quality Standards and Classification

New York State Saline Surface Water Quality Standards				
Class	Bacteria			Dissolved Oxygen
	Total Coliform ⁽¹⁾	Fecal Coliform ⁽¹⁾	<i>Enterococcus</i> ⁽¹⁾⁽²⁾	
SA	Median ≤ 70 MPN/100mL	-	GM ≤ 35/100mL STV 90% ≤ 130 cfu/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
SB	Monthly Median ≤ 2,400 cfu/100mL 80% ≤ 5,000 cfu/100mL	Monthly GM ≤ 200/100mL	GM ≤ 35/100mL STV 90% ≤ 130 cfu/100mL	> 4.8 mg/L (daily avg) ≥ 3.0 mg/L
I	Monthly Median ≤ 2,400 cfu/100mL 80% ≤ 5,000 cfu/100mL	Monthly GM ≤ 200/100mL	-	≥ 4.0 mg/L
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Notes:

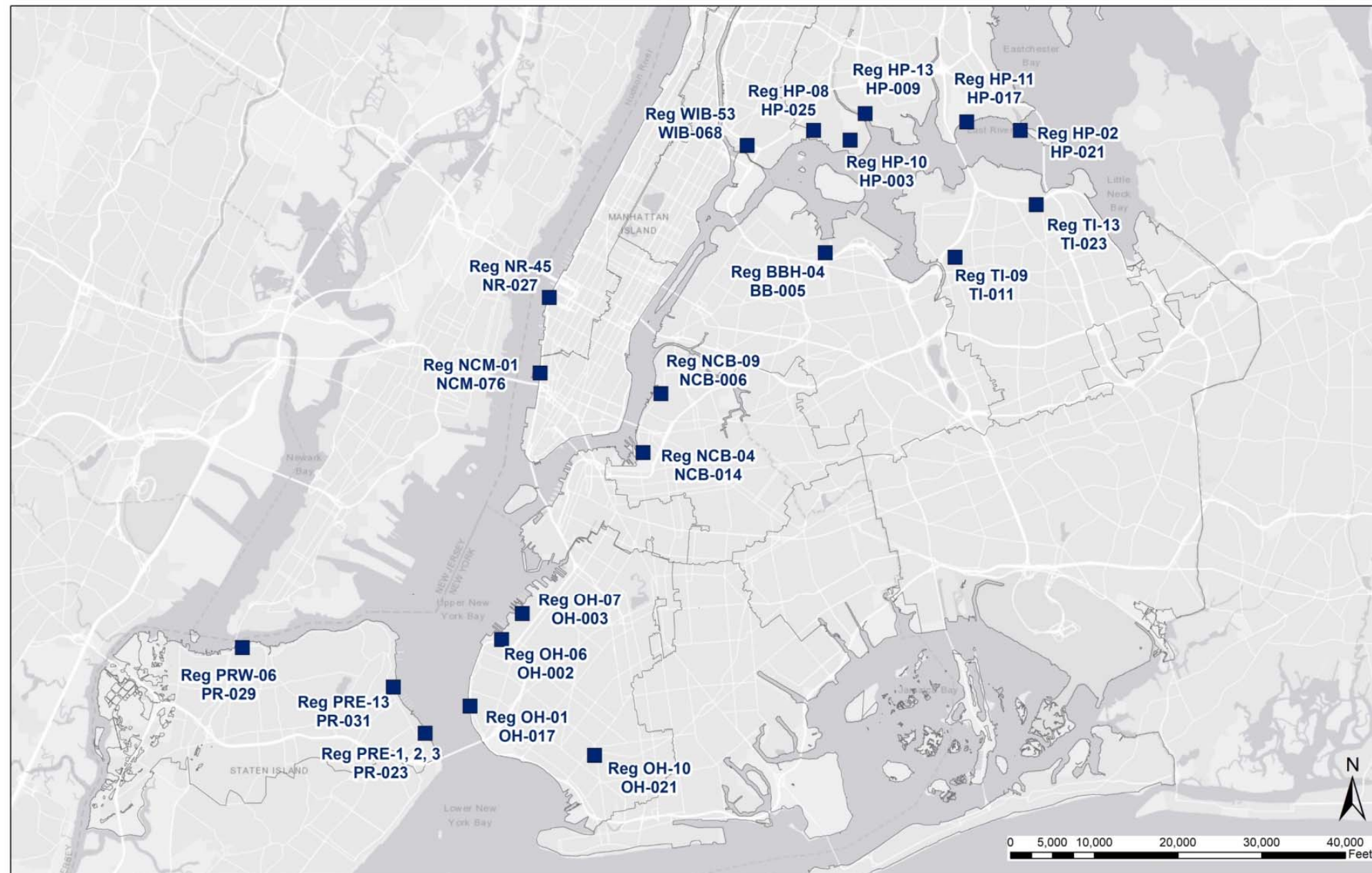
(1) Assessed during primary contact recreational season or as necessary to protect human health

(2) Applicable to coastal recreational waters only



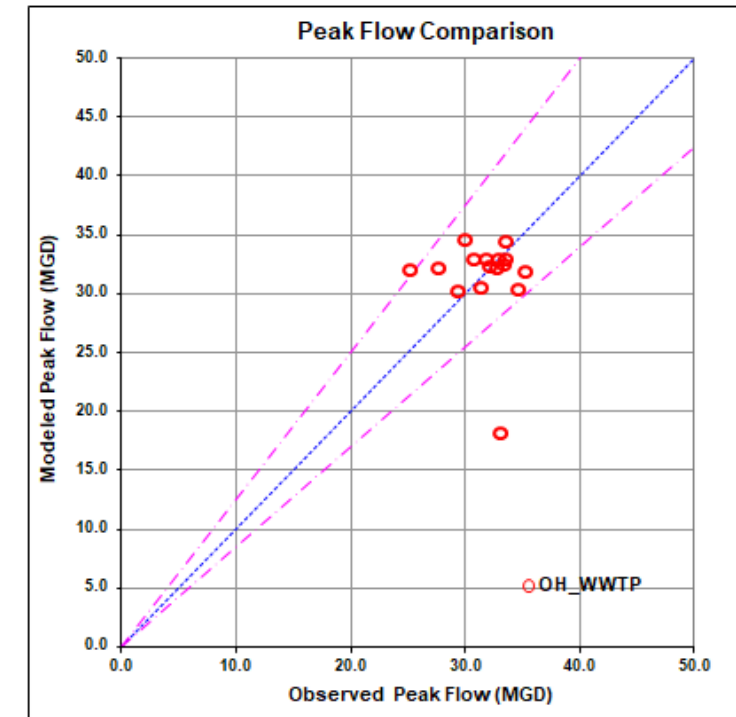
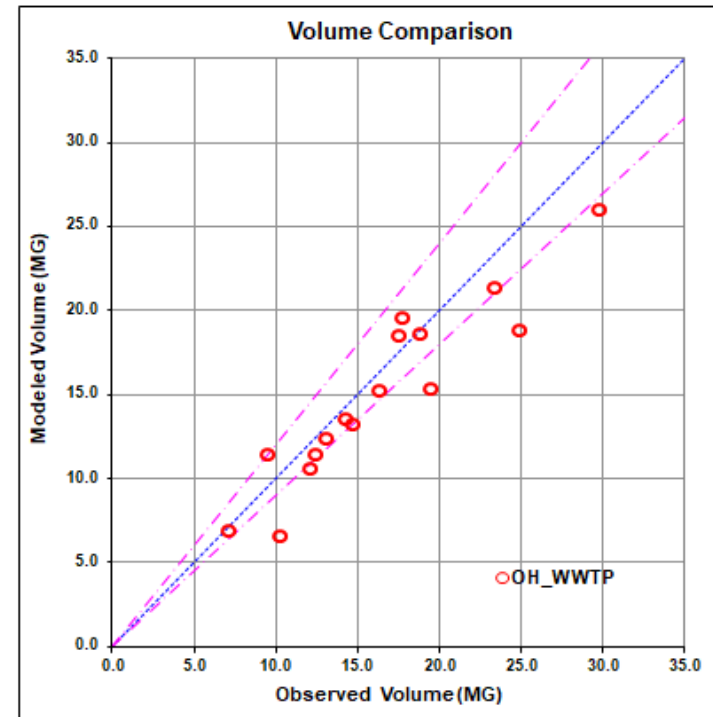
Data Collection Update

- Installed regulator flow monitoring equipment
- Completed flow monitoring of 20 open water regulators
- Received Passaic Valley Sewerage Commission (PVSC) sampling data



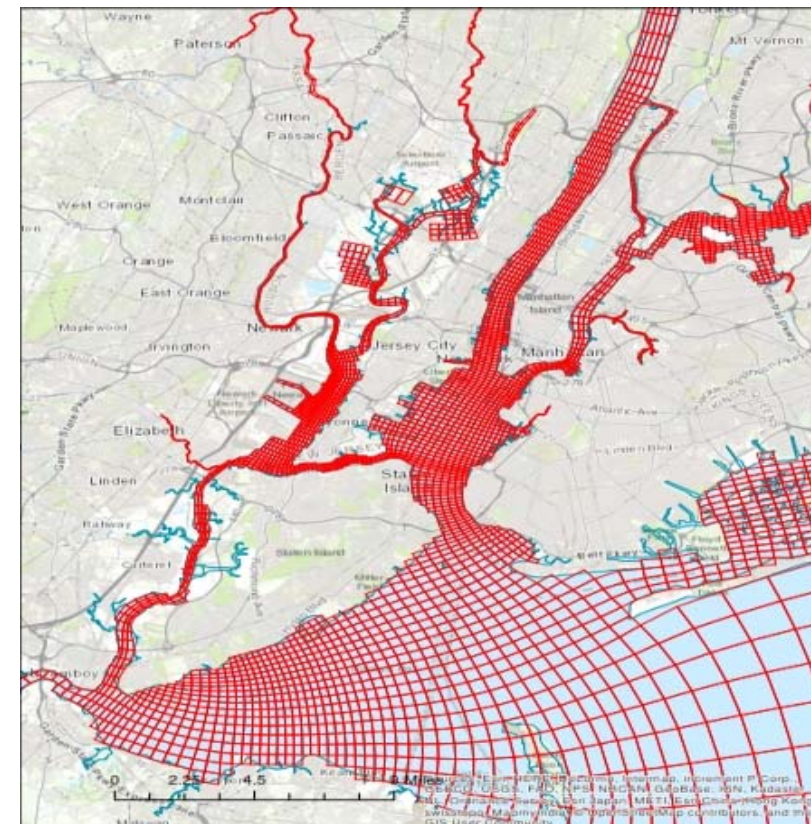
- **Collection System Modeling**

- Calibrating to meter data
- Updating Baseline Conditions Models
- Incorporating citywide green infrastructure



- **Water Quality Modeling**

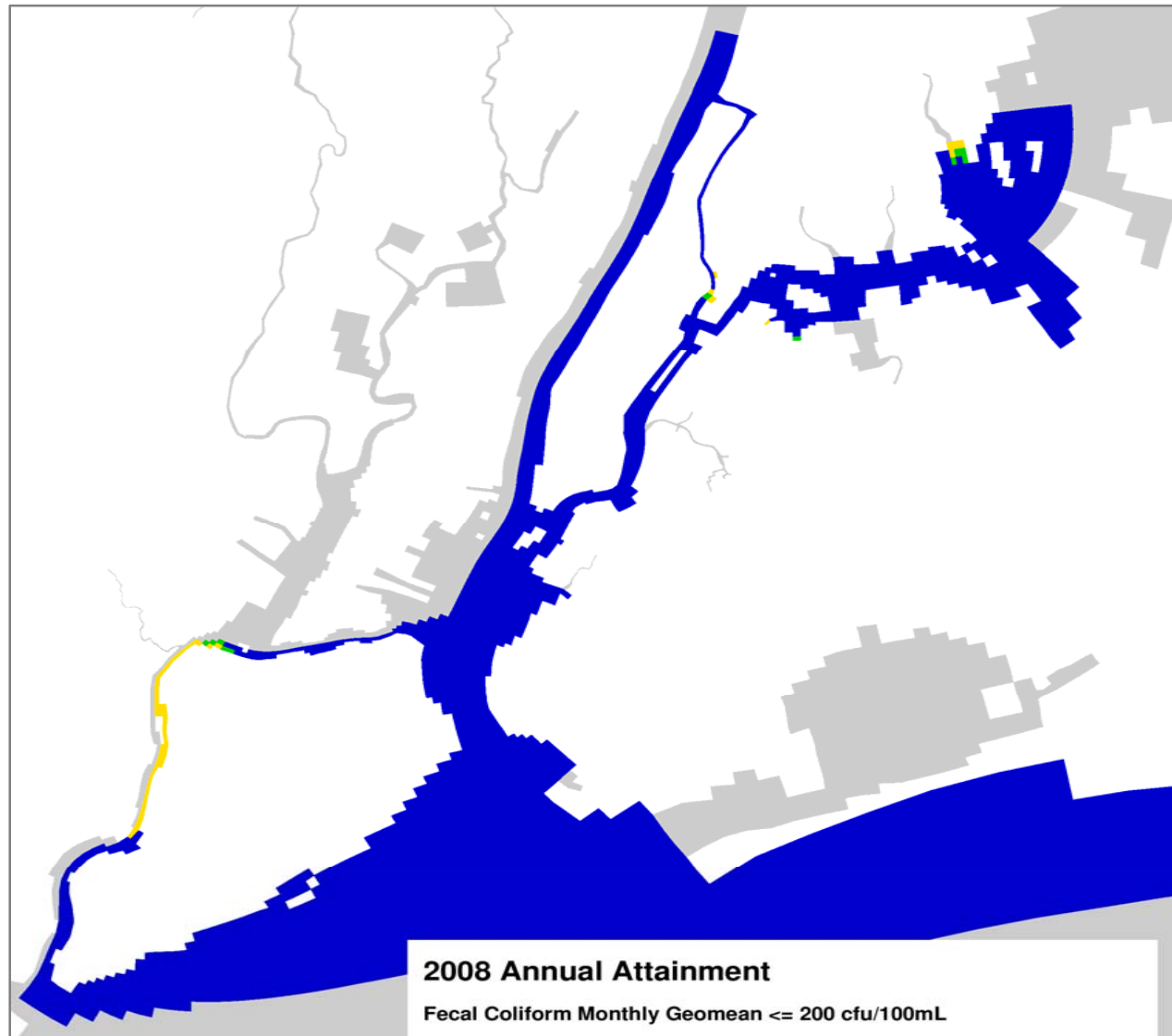
- Increasing the density of the water quality model grid cells
- Calibrating to NYC and NJ sampling data
- Conducting preliminary gap analysis using grid cells to represent attainment



Fecal Attainment – Existing Conditions

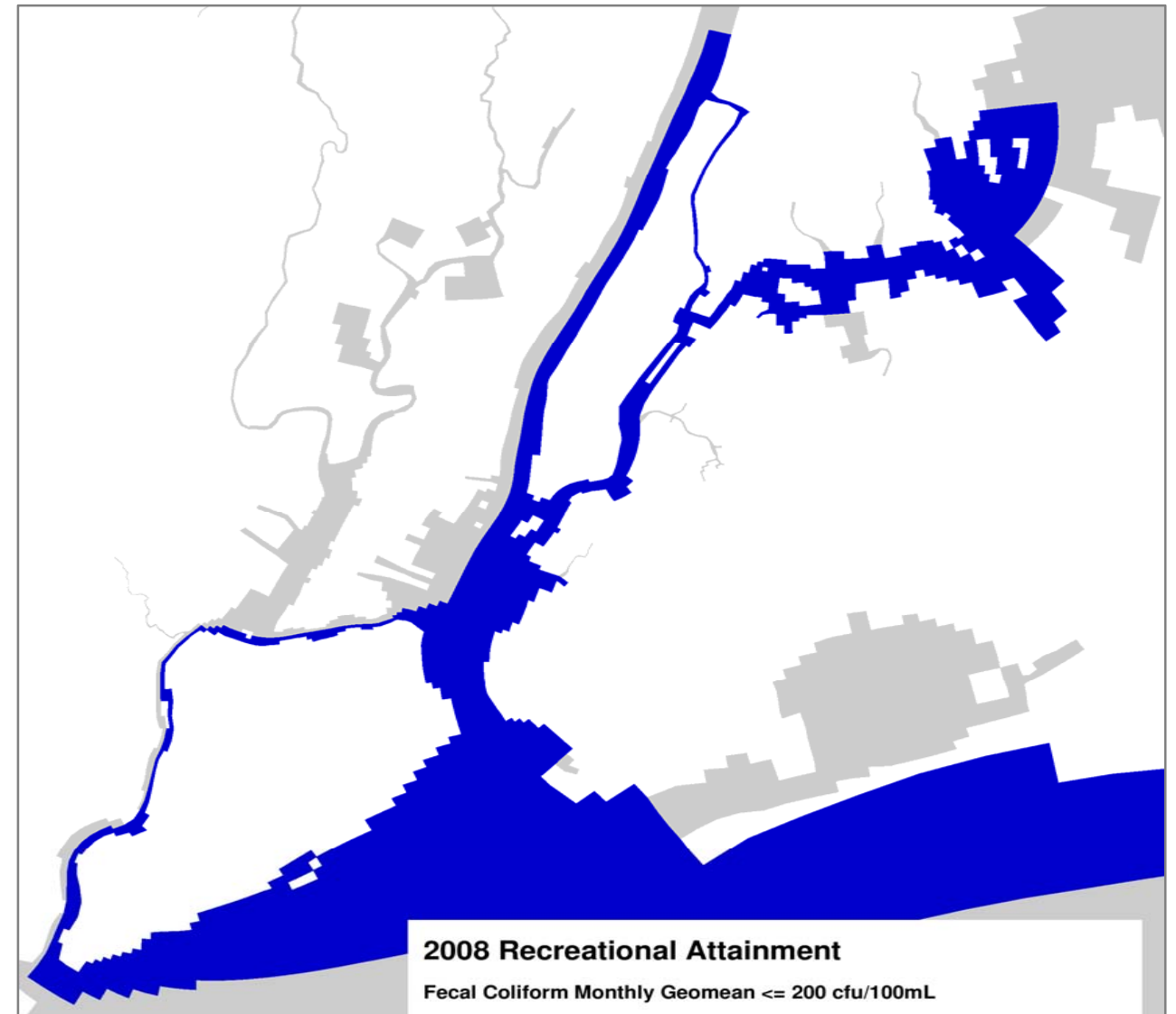
2008 Annual Attainment

Monthly Geomean \leq 200 cfu/100 mL
(Preliminary Results)



2008 Recreational Attainment

Monthly Geomean \leq 200 cfu/100 mL
(Preliminary Results)



Attainment (%)

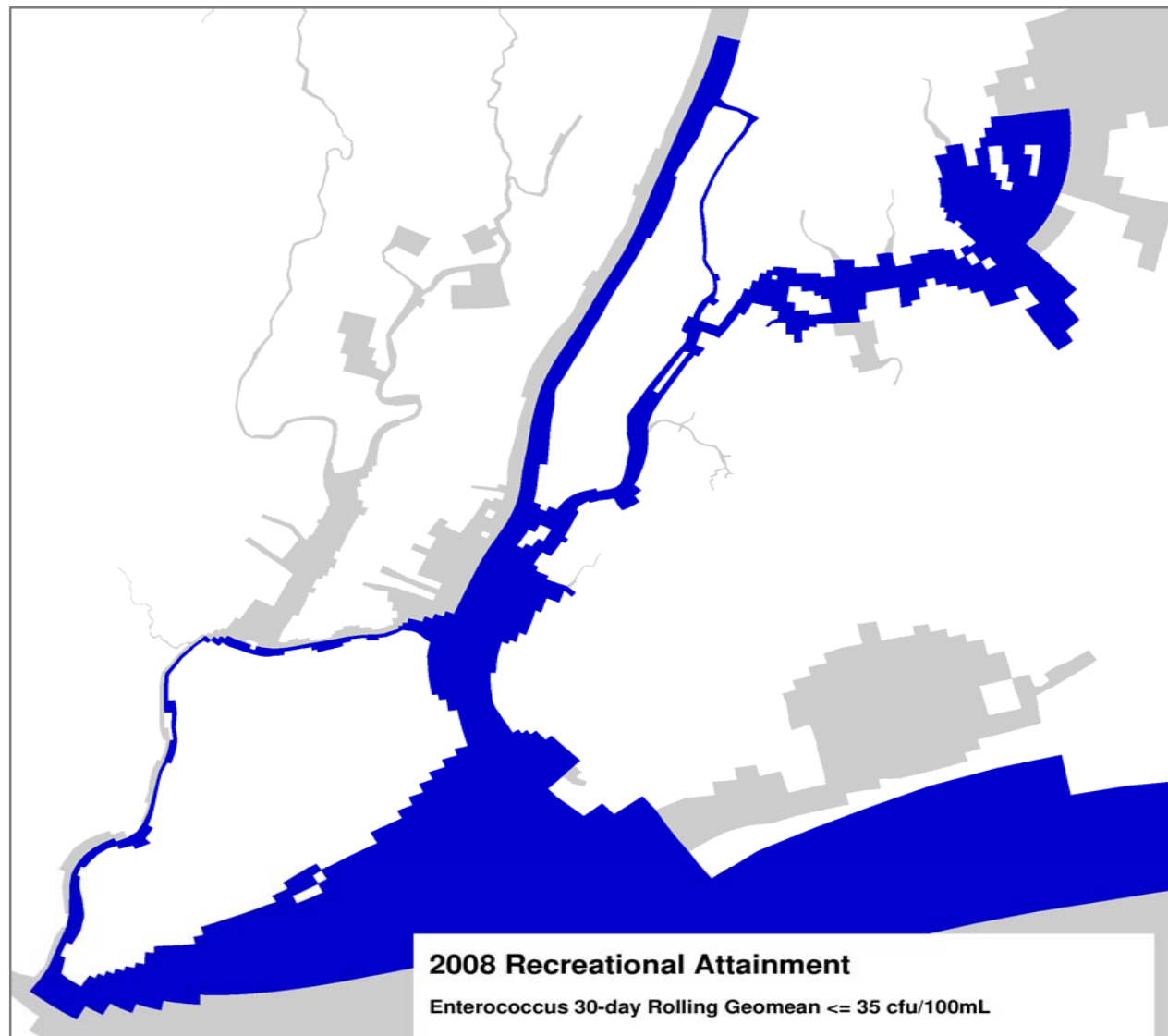


Entero Attainment – Existing Conditions

2008 Recreational Attainment (GM)

30-day Rolling Geomean \leq 35 cfu/100 mL

(Preliminary Results)

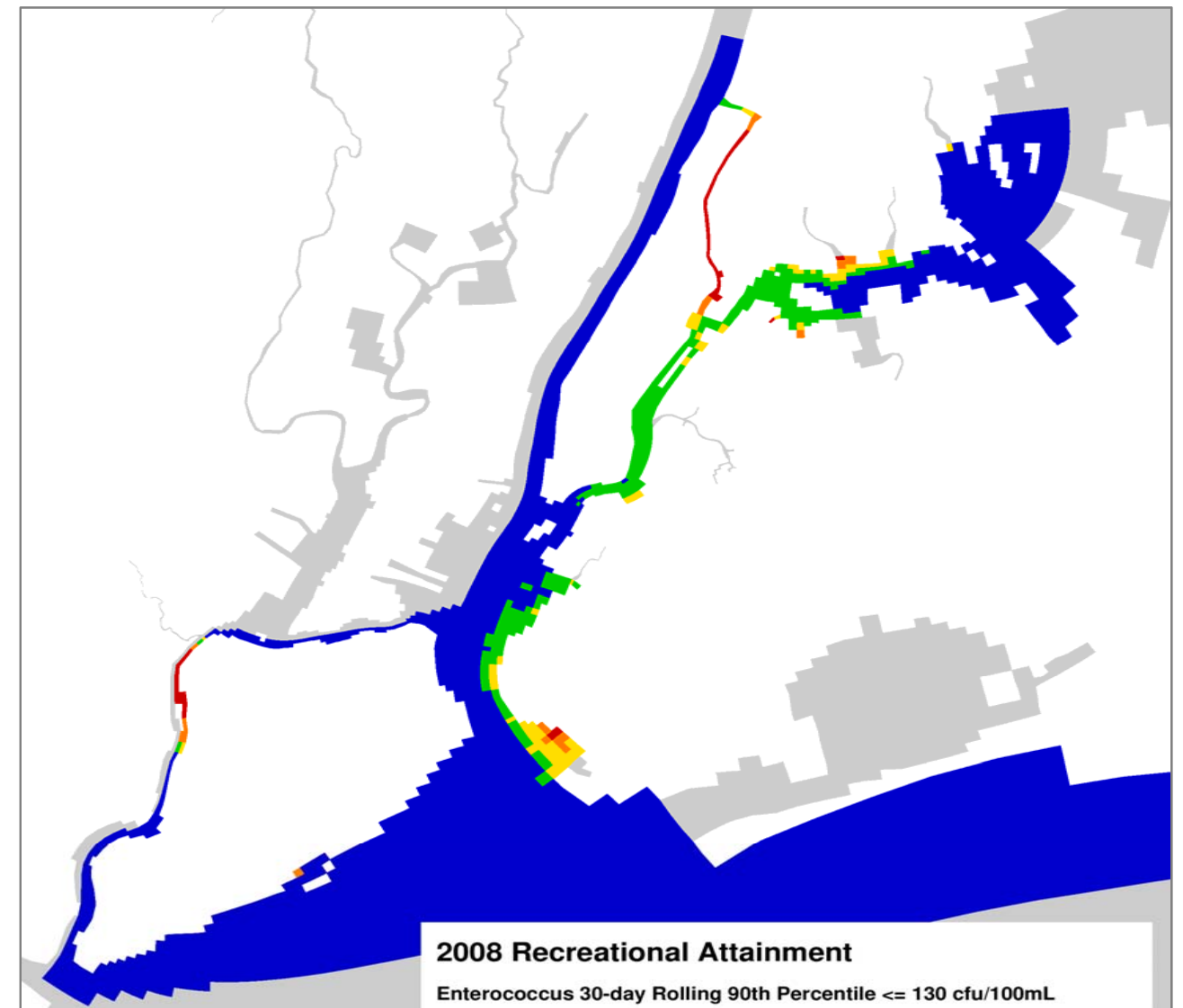


2008 Recreational Attainment
Enterococcus 30-day Rolling Geomean \leq 35 cfu/100mL

2008 Recreational Attainment (STV)

30-day Rolling 90th Percentile \leq 130 cfu/100 mL

(Preliminary Results)



2008 Recreational Attainment
Enterococcus 30-day Rolling 90th Percentile \leq 130 cfu/100mL

Attainment (%)



Preliminary Alternatives for Review & Analysis

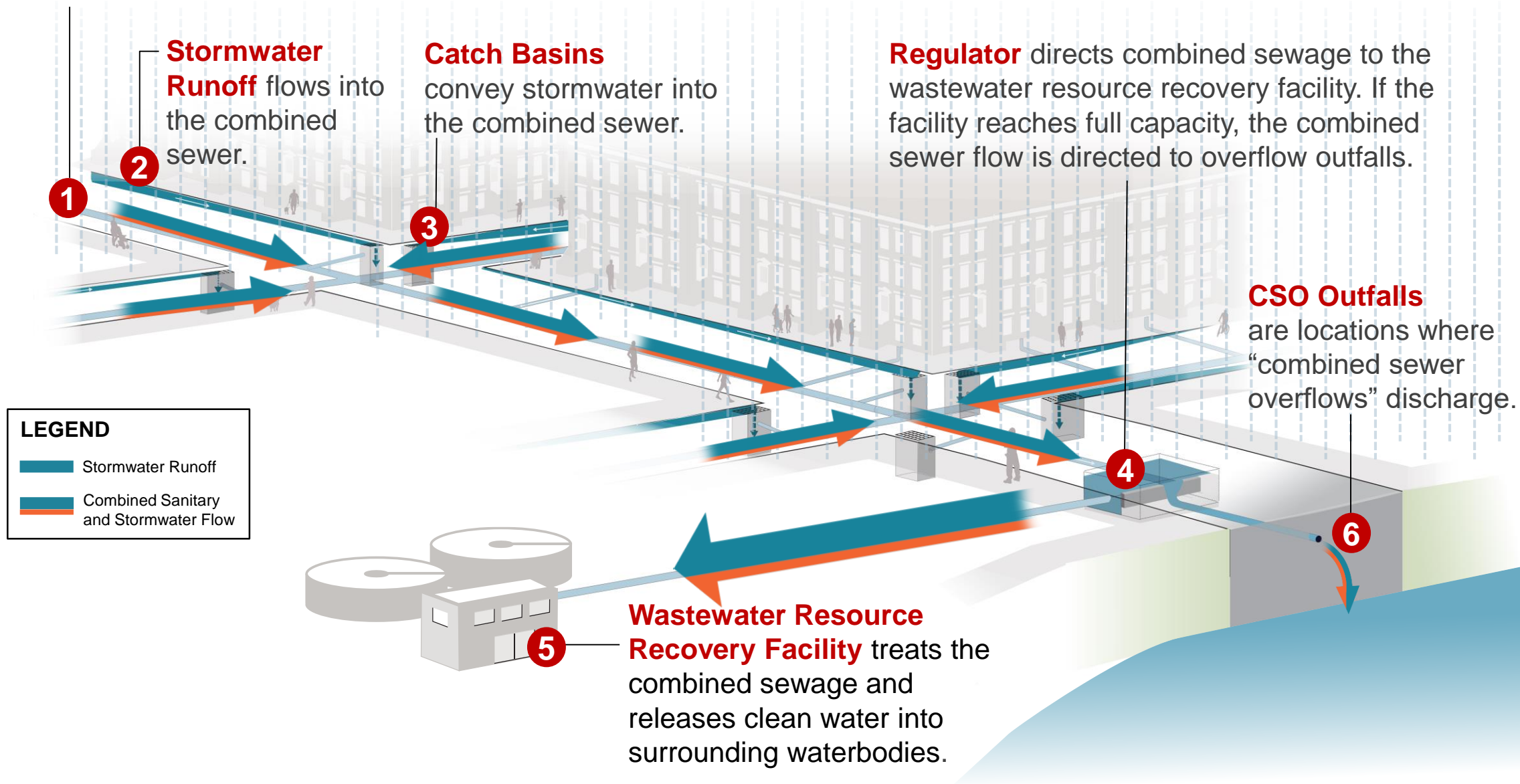
Source Control	Green Infrastructure		Storm Sewers		
System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Bending Weirs Control Gates	Pump Station Optimization	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping		
Water Quality / Ecological Enhancement	Floatables Control	Environmental Dredging	Wetland Restoration & Daylighting		
Treatment <i>Satellite:</i>	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)	
<i>Centralized:</i>	WRRF Expansion				
Storage	In-System	Shaft	Tank	Tunnel	

Retained Alternatives

Ongoing Projects

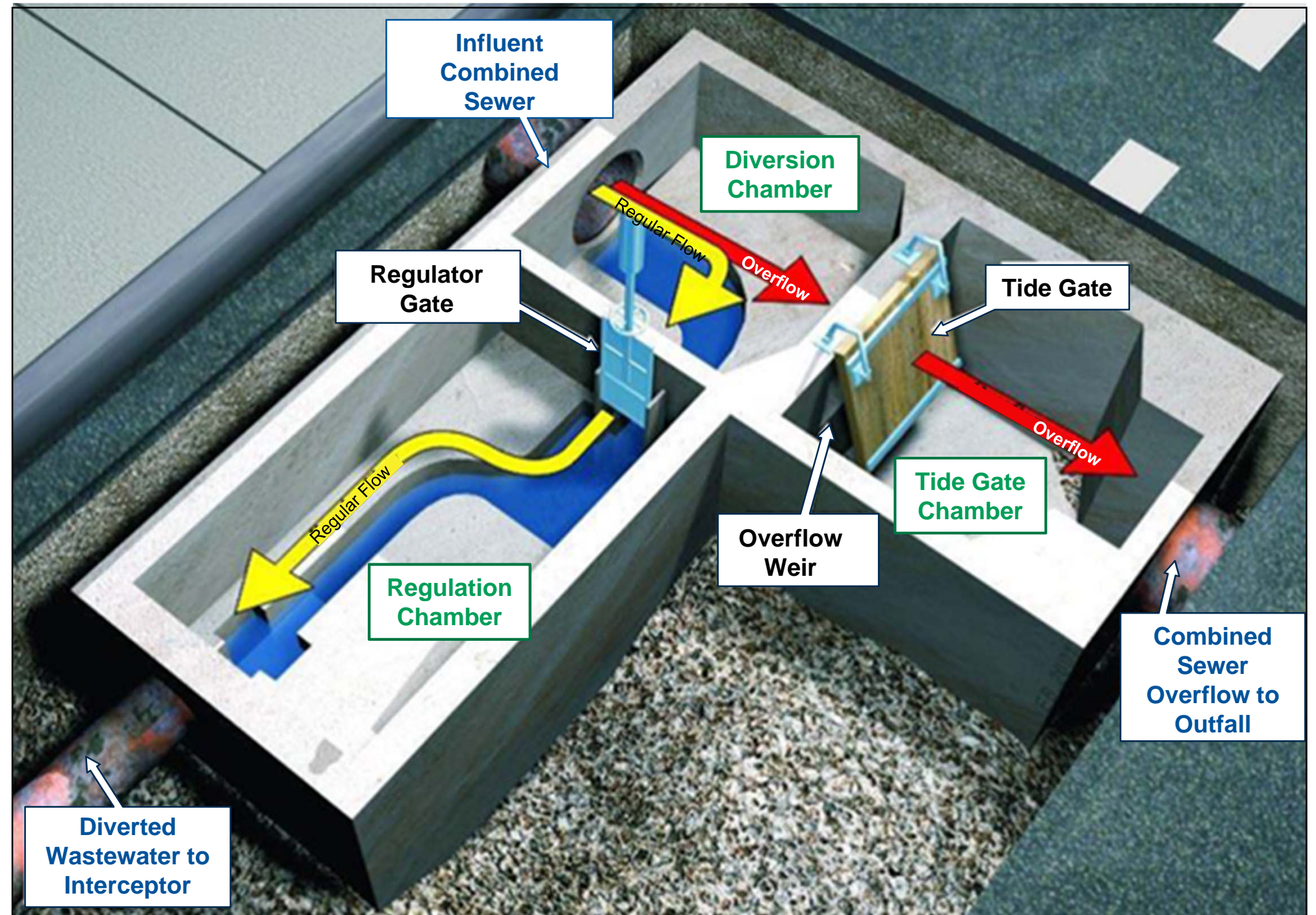
CSO Regulator Operation

Combined Sewer conveys stormwater runoff and sanitary waste to the Wastewater Resource Recovery Facility.

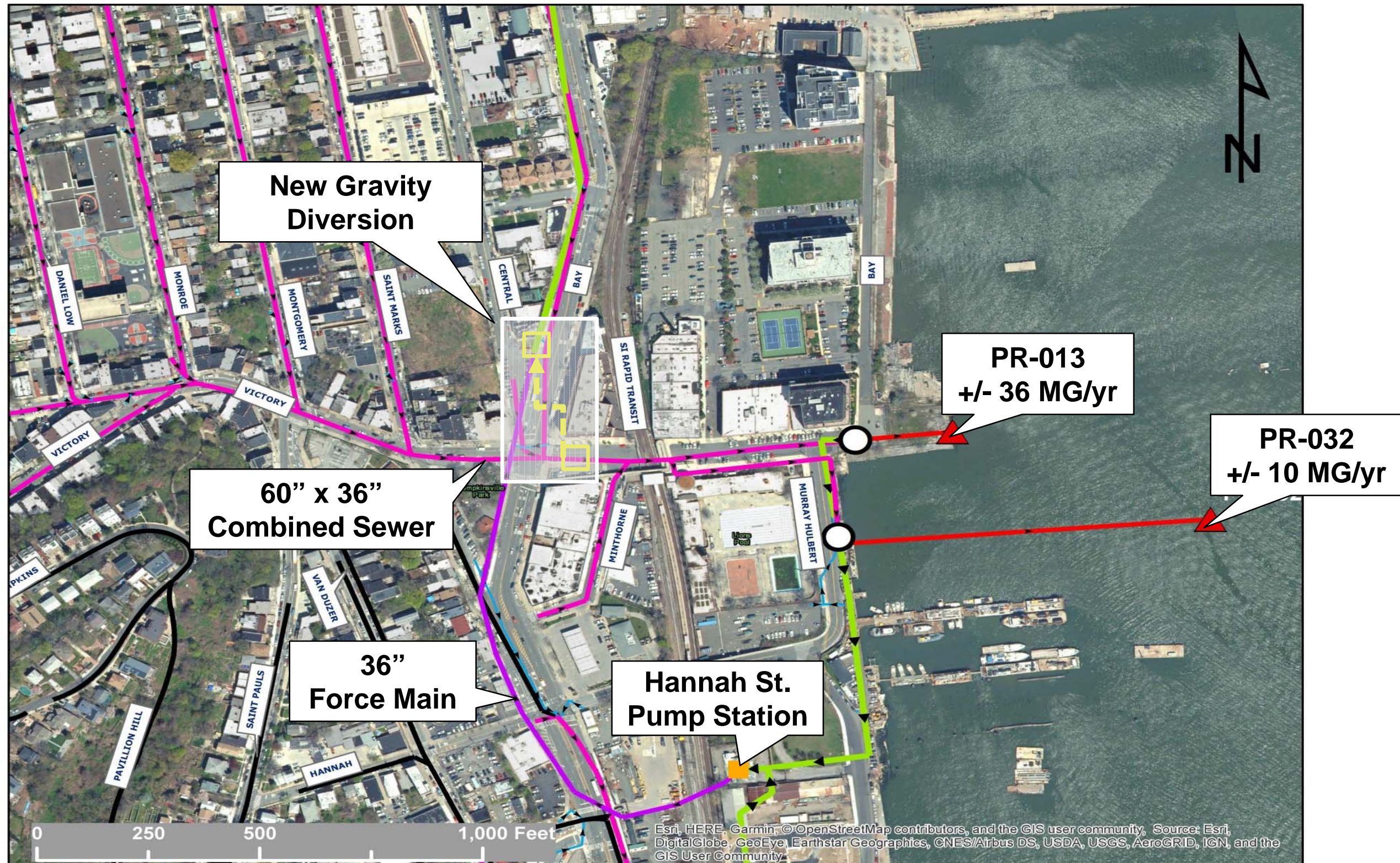


Collection System Optimization

- Evaluating regulator optimization alternatives using a specialized optimization software
- Typical optimization measures include:
 - Increasing dry weather flow connection
 - Weir modifications
 - Localized branch sewer relief
- Strategy Assessment Criteria:
 - Cost
 - Overflow volume, duration, and timing
 - Outfall sensitivity (beaches, boat launches, etc.)
 - Hydraulic impacts (flooding risks)



Example of Gravity Diversion Structure



Ongoing Citywide Floatables Program

■ Street Sweeping



■ Catch Basin Hooding

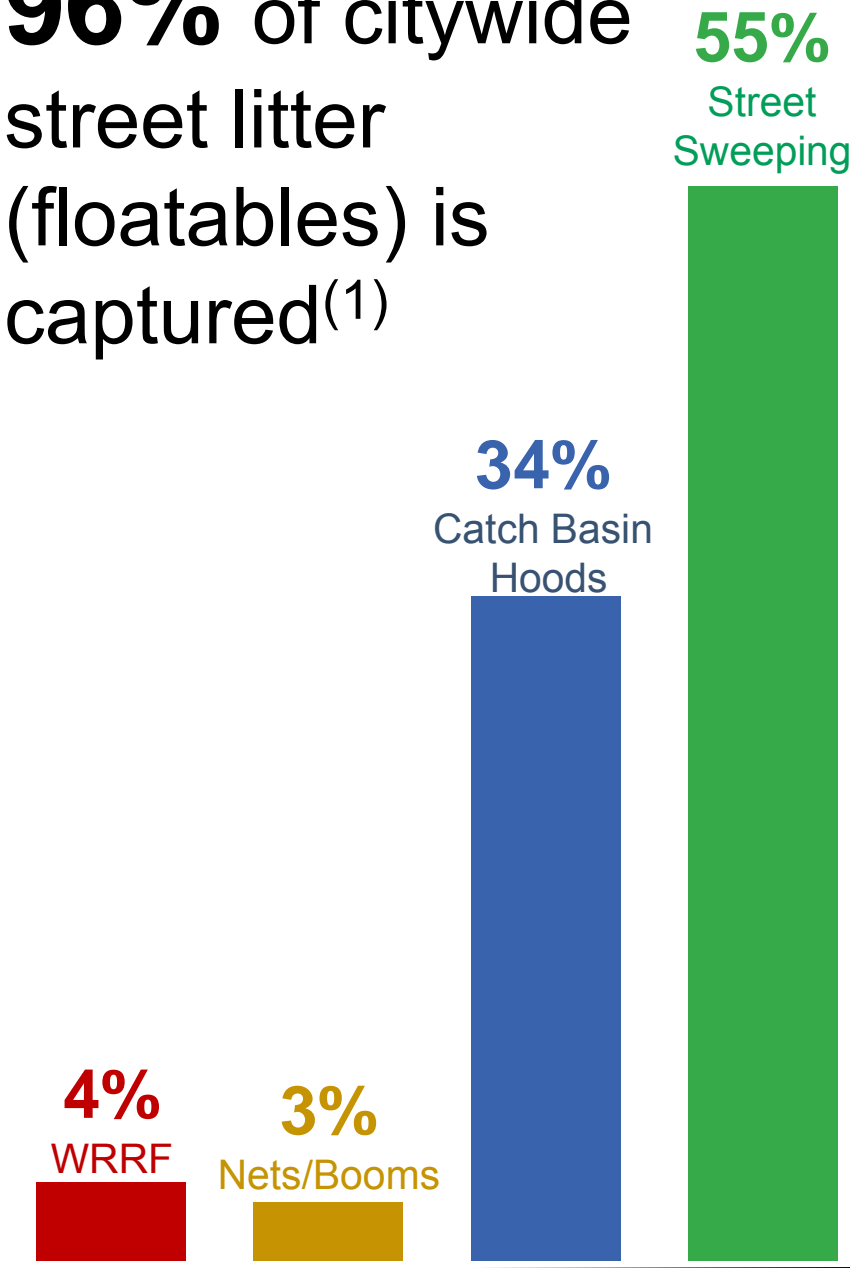


■ Netting/Booms



■ Wastewater Resource Recovery Facility (WRRF)

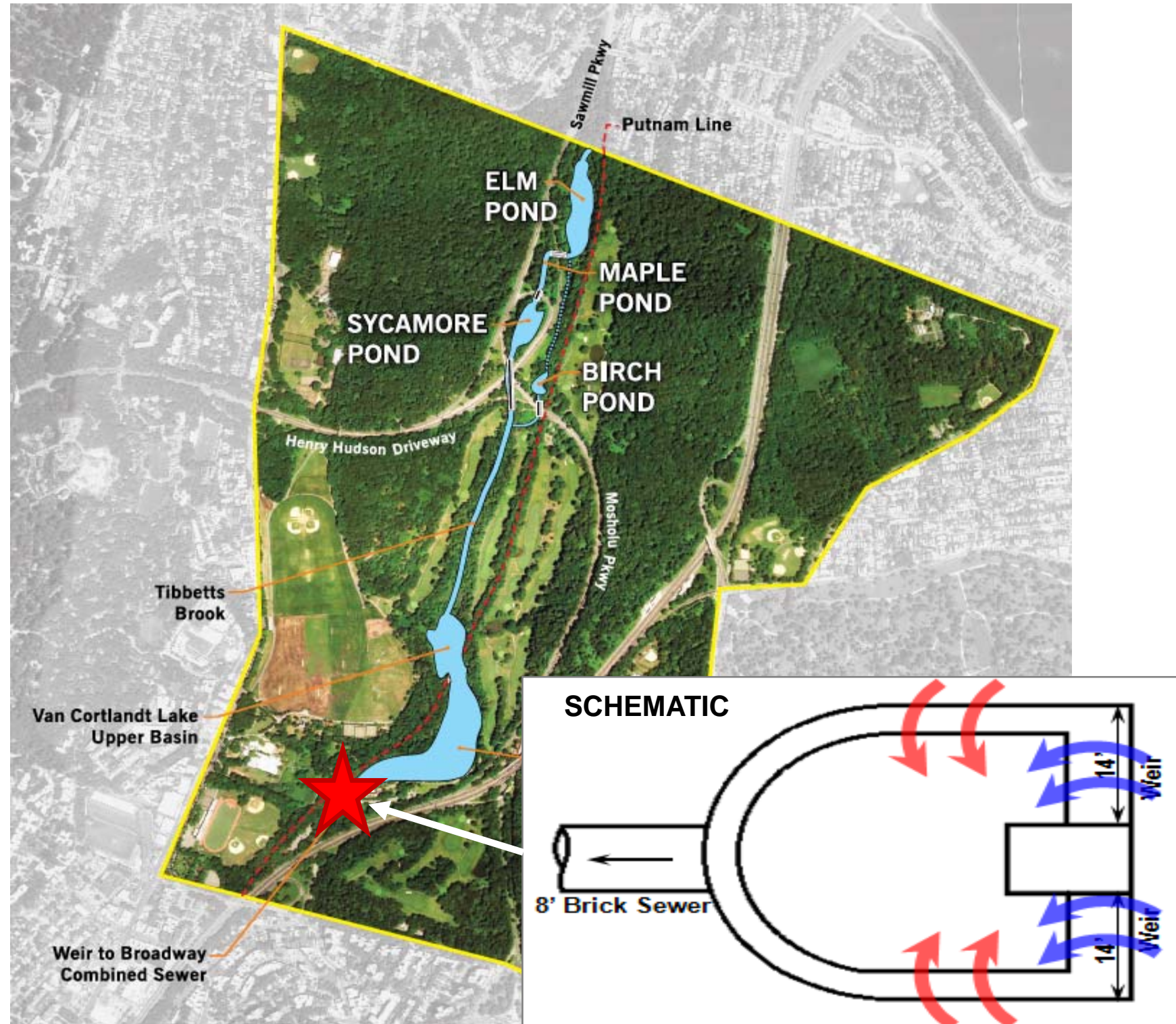
96% of citywide street litter (floatables) is captured⁽¹⁾



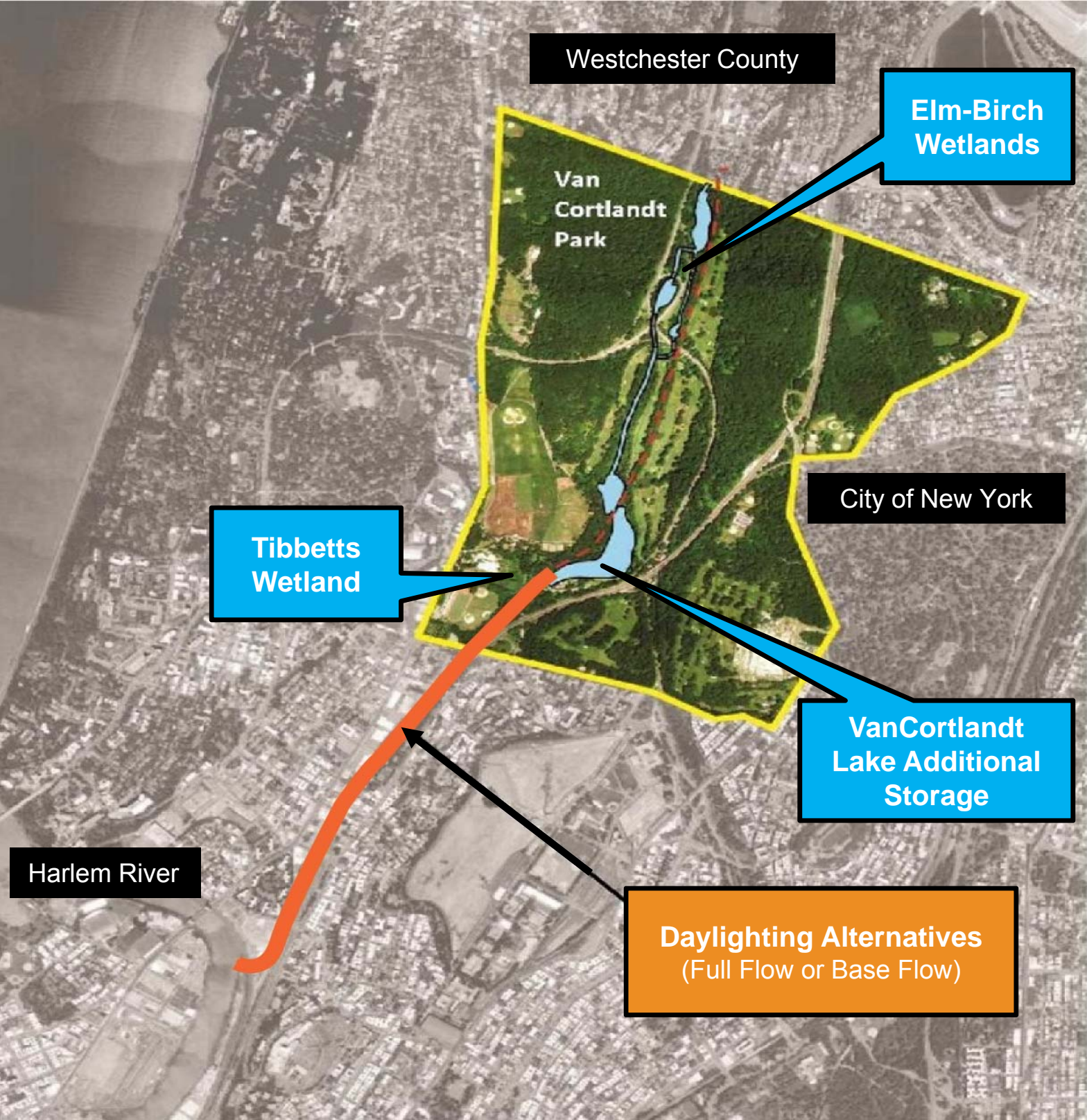
Citywide Floatables Capture

(1) Source: NYC Stormwater Management Program, NYCDEP, August 2018 29

Tibbetts Brook Existing Conditions – Overflow Weir



Tibbetts Brook Alternatives



ALTERNATIVES	
1	VanCortlandt Lake Additional Storage BMP
2	Tibbets Wetland BMP
3	Elm-Birch Wetlands BMP
4	All three above BMPs Combined
5	Daylighting Full Flow
6	Daylighting Full Flow and BMP combination
7	Daylighting Base Flow
8	Daylighting Base Flow + VanCortlandt Lake
9	Daylighting Base Flow + Tibbets Wetland
10	Daylighting Base Flow + Elm-Birch Wetlands
11	Daylighting Base Flow + Van Cortlandt + Elm-Birch
12	Daylighting Base Flow + Van Cortlandt + Tibbets
13	Daylighting Base Flow + Tibbets + Elm-Birch
14	Daylighting Base Flow + All three BMPs

Putnam Trail (CSX) – Tibbetts Brook Existing Conditions



WEST 230TH STREET



NEAR HARLEM RIVER



- Compile & Analyze Existing Conditions
- Hydrology and Hydraulics Modeling & Analyses
- Develop & Evaluate Alternatives
- Feasibility Technical Memo

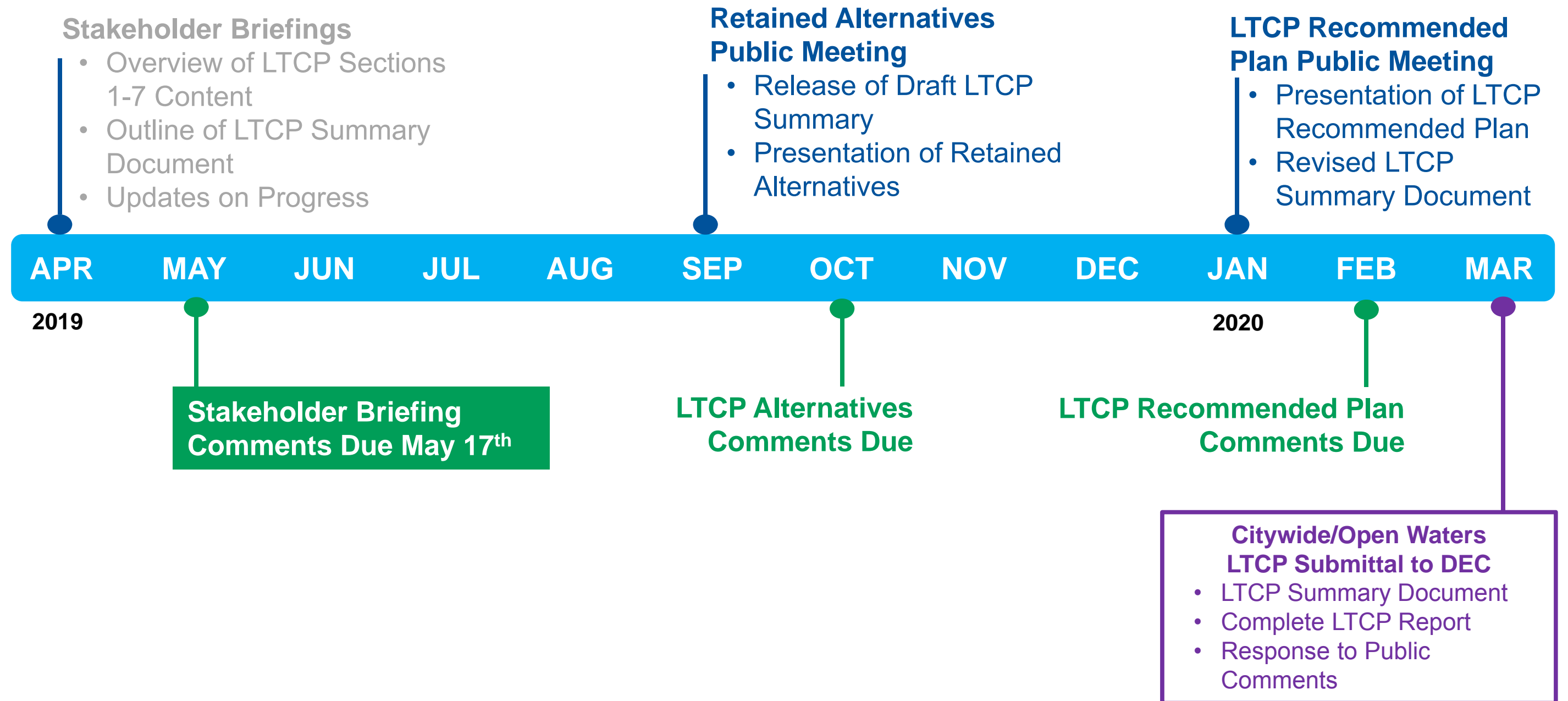


- Survey of Existing Sewer Lines
 - Phase I Environmental Site Assessment
- Optional Tasks:*
- Limited Phase II Environmental Site Assessment
 - Topo Survey

Next Steps

Mikelle Adgate
Senior Advisor, BPAC
DEP

Citywide/Open Waters Schedule



- Visit the DEP Website for more information: www.nyc.gov/dep/ltcp
 - Monthly Updates on the Citywide LTCP
 - Citywide LTCP Content: sampling information, baseline information etc.
 - CSO Order including LTCP Goal Statement
 - Links to Waterbody/Watershed Facility Plans
 - Presentations, Meeting Materials and Meeting Summaries
 - LTCP Brochure and Waterbody Fact Sheets
 - All Submitted LTCP Reports and Other LTCP Updates
 - NYC's Green Infrastructure Reports and Grant Program
 - Green Infrastructure Interactive Map of Projects
 - NYC Waterbody Advisory Program
 - Upcoming Meeting Announcements

Thank You!



www.nyc.gov/dep/ltcp
ltcp@dep.nyc.gov