Environmental Protection

Alley Creek and Little Neck Bay

CSO Long Term Control Plan

Public Meeting #3

Final LTCP Plan Review

Queensborough Community College

November 17, 2015

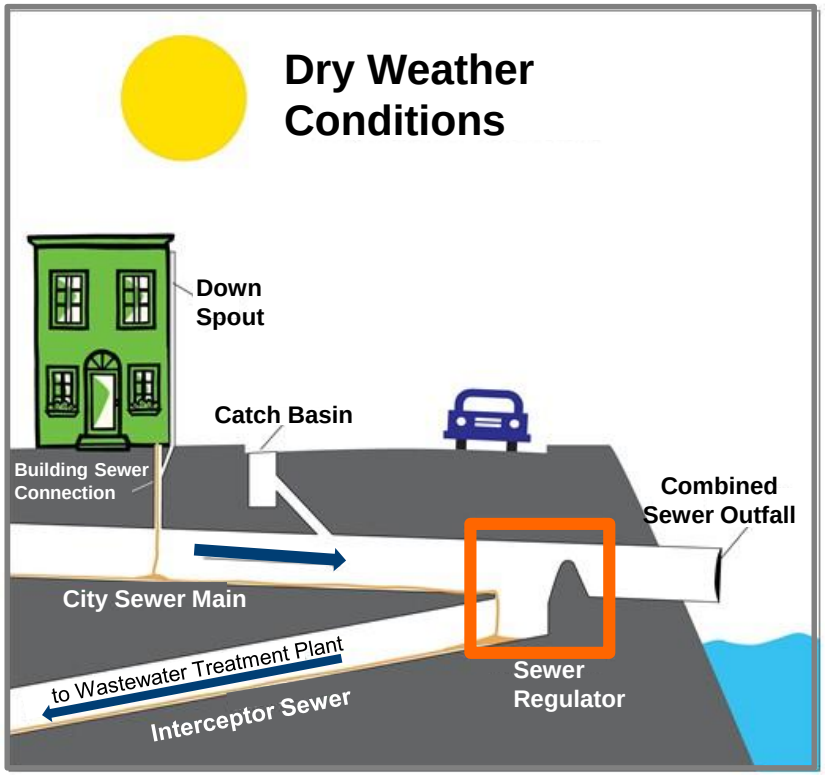
Welcome and Introductions

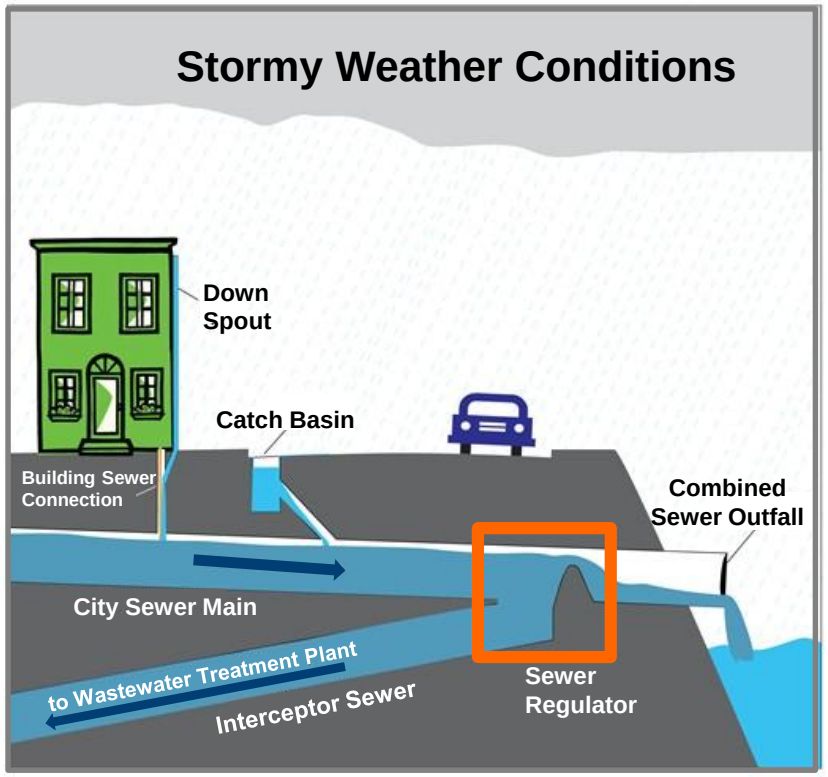
Ibrahim Abdul-Matin
Director of Community Affairs
DEP

Jim Mueller, P.E.
Assistant Commissioner
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**.





- 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).
- 65% to 90% of **combined** sanitary & storm flow is captured at treatment plants.

What is a LTCP and CSO Consent Order?

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable DEC 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

How does rainfall affect CSOs?

- Rainfall characteristics that may trigger a CSO event at Alley Creek / Little Neck Bay:
  - ≥ 0.5-inch of constant rainfall over a period of 1 hour

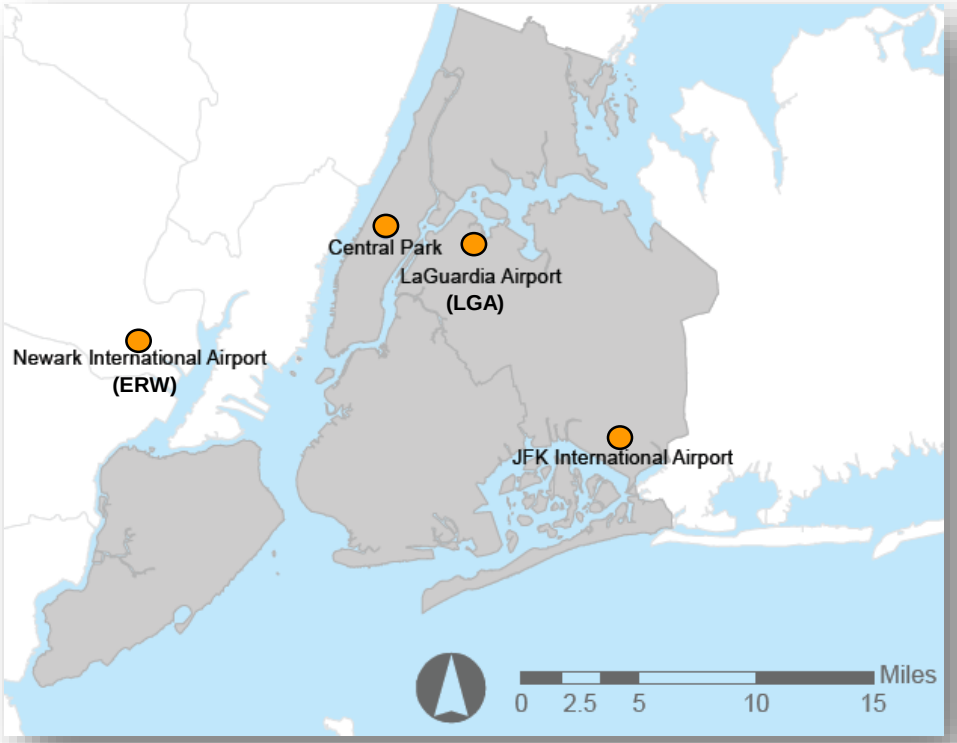
- **Not every rainfall causes a CSO event:**
  - Of the average 100 rainfall events per year about 16 CSO events may occur at Alley Creek / Little Neck Bay

Photo Credit: Baptisete Pons
https://www.flickr.com/photos/bpt/2882285636/

Rainfall Selection for Model Updates

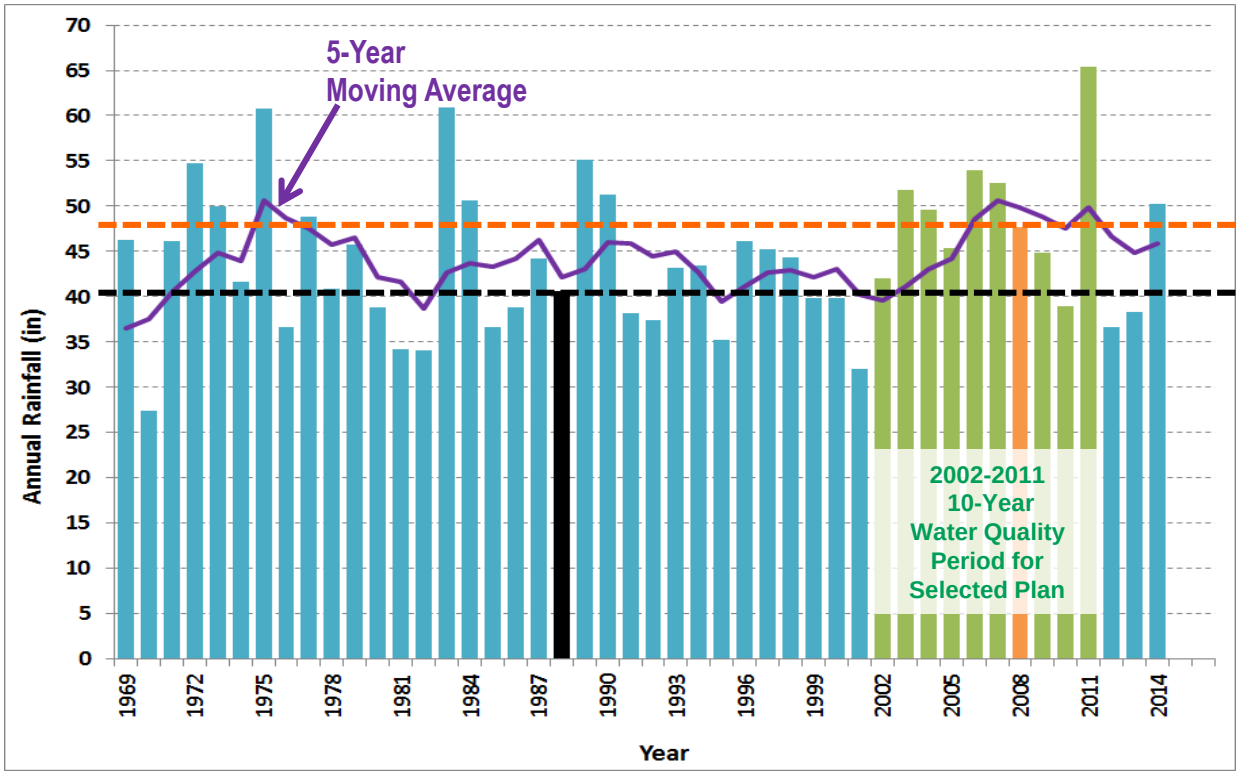
Evaluated a comprehensive range of rainfall data:

- Historical data range: **42 years** from 1969 to 2010
- Four representative rainfall gauges: Central Park, LGA, JFK, and ERW
- Selected **2008 JFK rainfall** as the most representative of average annual rainfall across all four gauges



Model Calibration & Updates

- Calibrated with Harbor Survey and LTCP sampling data
- Future wastewater flows based on **2040 population** projections
- Recalibrated based on **revised impervious areas**
- Alternative Model runs based on 1-yr data (JFK 2008 “Typical Year Rainfall”)
- Selected Plan Model runs based on 10-yr data (2001 to 2011) to address elevated rainfall amount due to **climate change**

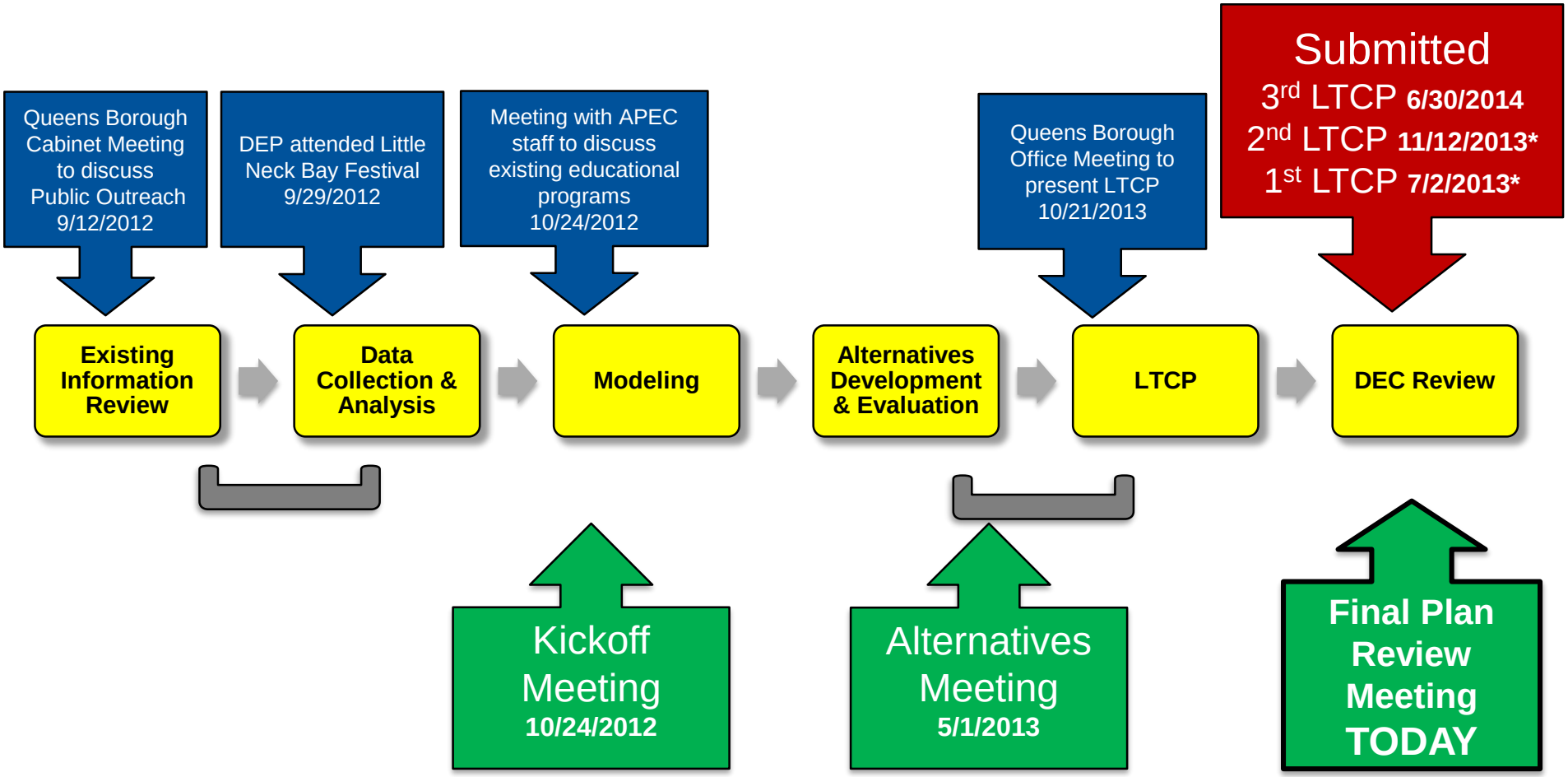


Questions?

Summary of Previous Public Meetings

Ibrahim Abdul-Matin
Director of Community Affairs
DEP

LTCP Process and Public Involvement



*Supplemental Documentation was submitted to DEC on 11/4/2013 and 5/6/2015 in response to DEC review comments.

Public Meeting #1 – Summary

Date: October 24, 2012

Location: Alley Pond Environmental Center

Attendees: 15

Presented on:

- Overview of LTCP Process & Goals
- Waterbody/Watershed Characteristics
- Ongoing WQ Improvement Projects
  - Sewer Improvements
  - 5 MG CSO Retention Facility
  - New CSO Outfall TI-025 (at Retention Facility)
  - Ecological Restoration
  - Tallman Island WWTP – BNR Upgrade
- Review of Historical WQ Monitoring

Outfall & Sewer Improvements = $100 M

CSO Retention Facility = $30 M

Public Meeting #2 – Summary

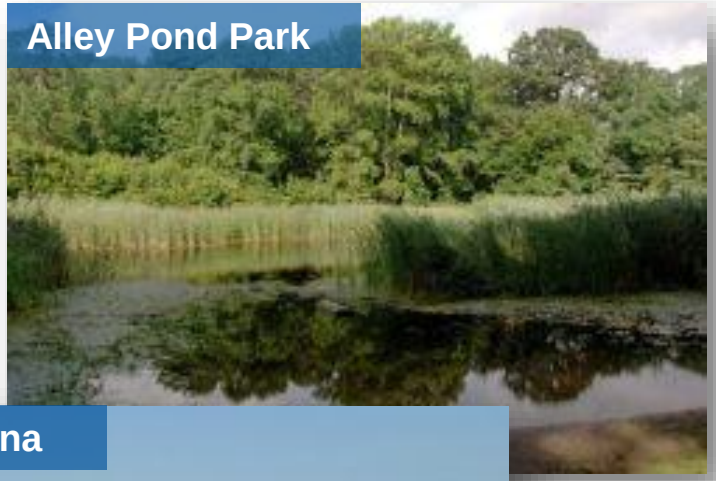
Date: May 1, 2013

Location: Alley Pond Environmental Center

Attendees: 10

Presented on:

- Brief Recap of Meeting #1
- Water Quality Monitoring
  - Harbor Survey Program
  - LTCP Sampling Results
- Modeling Results
  - Wet Weather Discharges
  - Distribution of Flows & Loads
- Current Uses
  - Public Waterfront Access
  - Natural Features
- Comparison of Key Alternatives

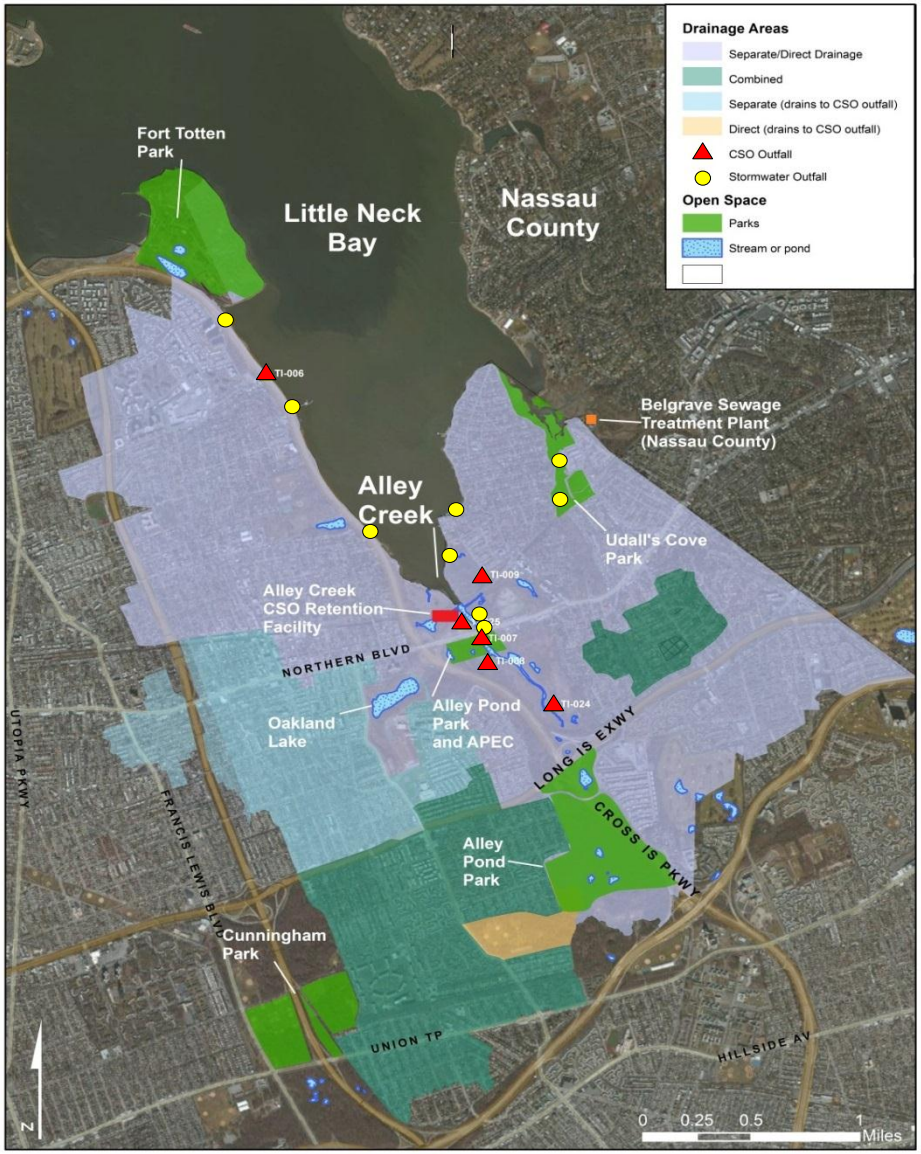


Questions?

Review of
Water Quality Results

Jim Mueller, P.E.
Assistant Commissioner
DEP

Alley Creek & Little Neck Bay Drainage Area



- Tributary to East River & Long Island Sound
- **Little Neck Bay** classified for primary contact recreation
  - **Class SB** – Bathing and Fishing
- **Alley Creek** classified for primary contact recreation*
  - **Class I** – Boating and Fishing
- DEP wet weather discharges include:
  - 6 CSO Outfalls
  - 9 Stormwater Outfalls

	Drainage Area
Acres	4,880
Served by combined sewers	47%

*Effective 11/4/2015 - Based on DEC revised rule for Class I waterbodies

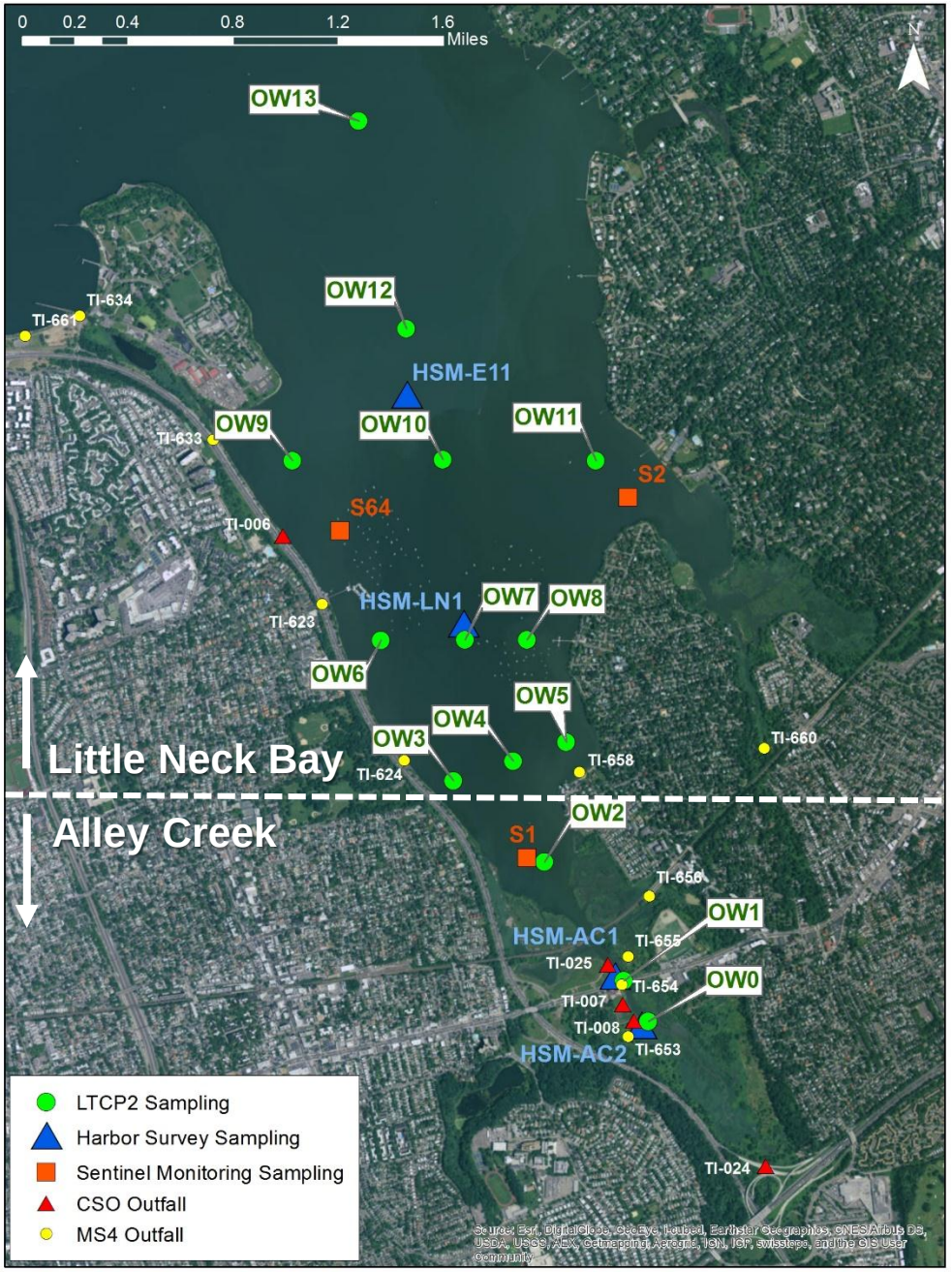
Alley Creek & Little Neck Bay Sampling Locations

LTCP Sampling:

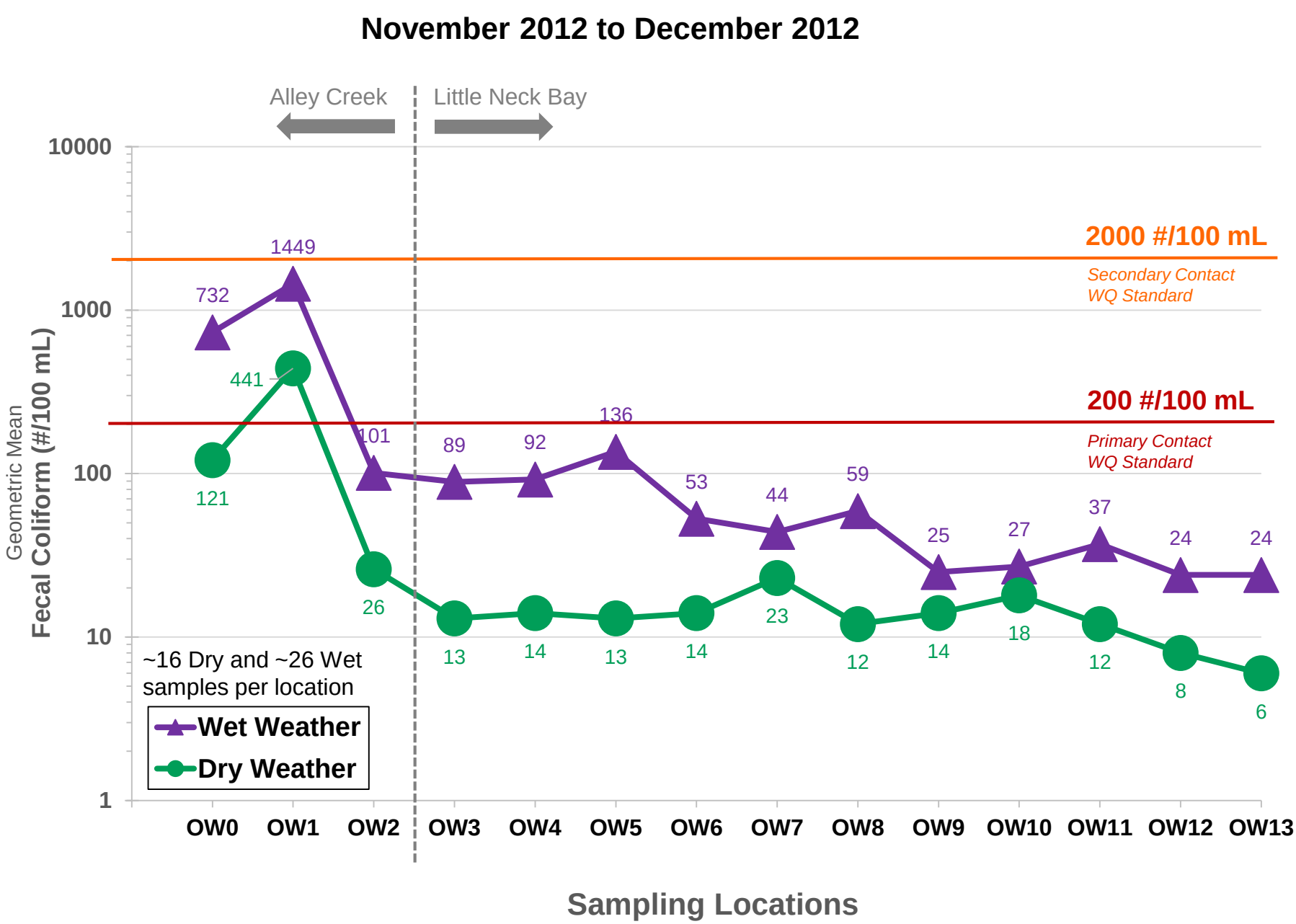
- **2 CSO Outfalls**
  (TI-024 & TI-025)
- **2 Stormwater Outfalls**
  (TI-623 & TI-624)
- **Receiving Water Sampling**
  - 13 locations
    Alley Creek: (OW0 to OW2)
    Little Neck Bay: (OW3 to OW13)

Other Sampling Programs:

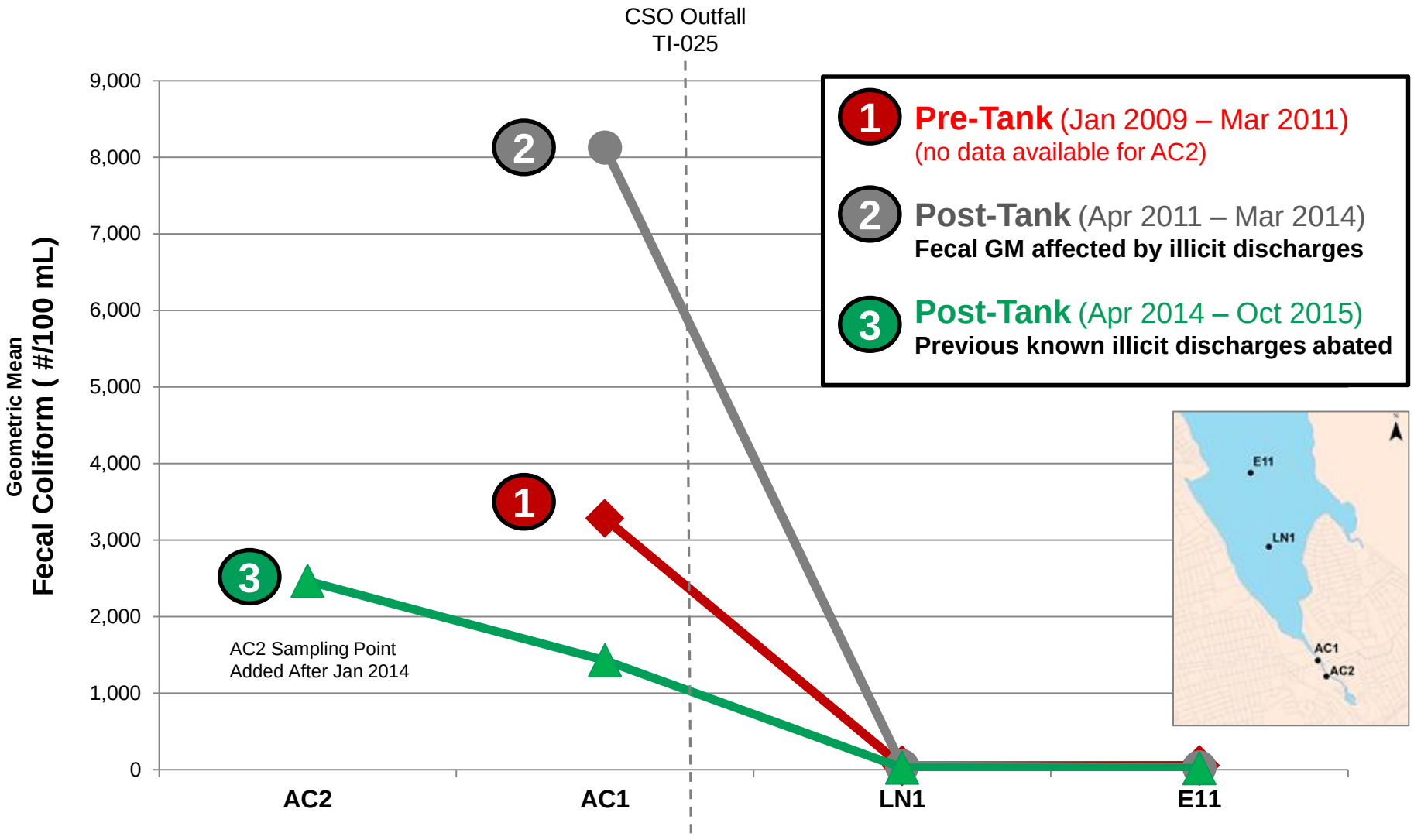
- **Harbor Survey Monitoring**
  - 4 locations
    (AC1, AC2, LN1, E11)
- **Sentinel Monitoring**
  - 3 locations
    (S1, S2, S64)



Fecal Coliform Results

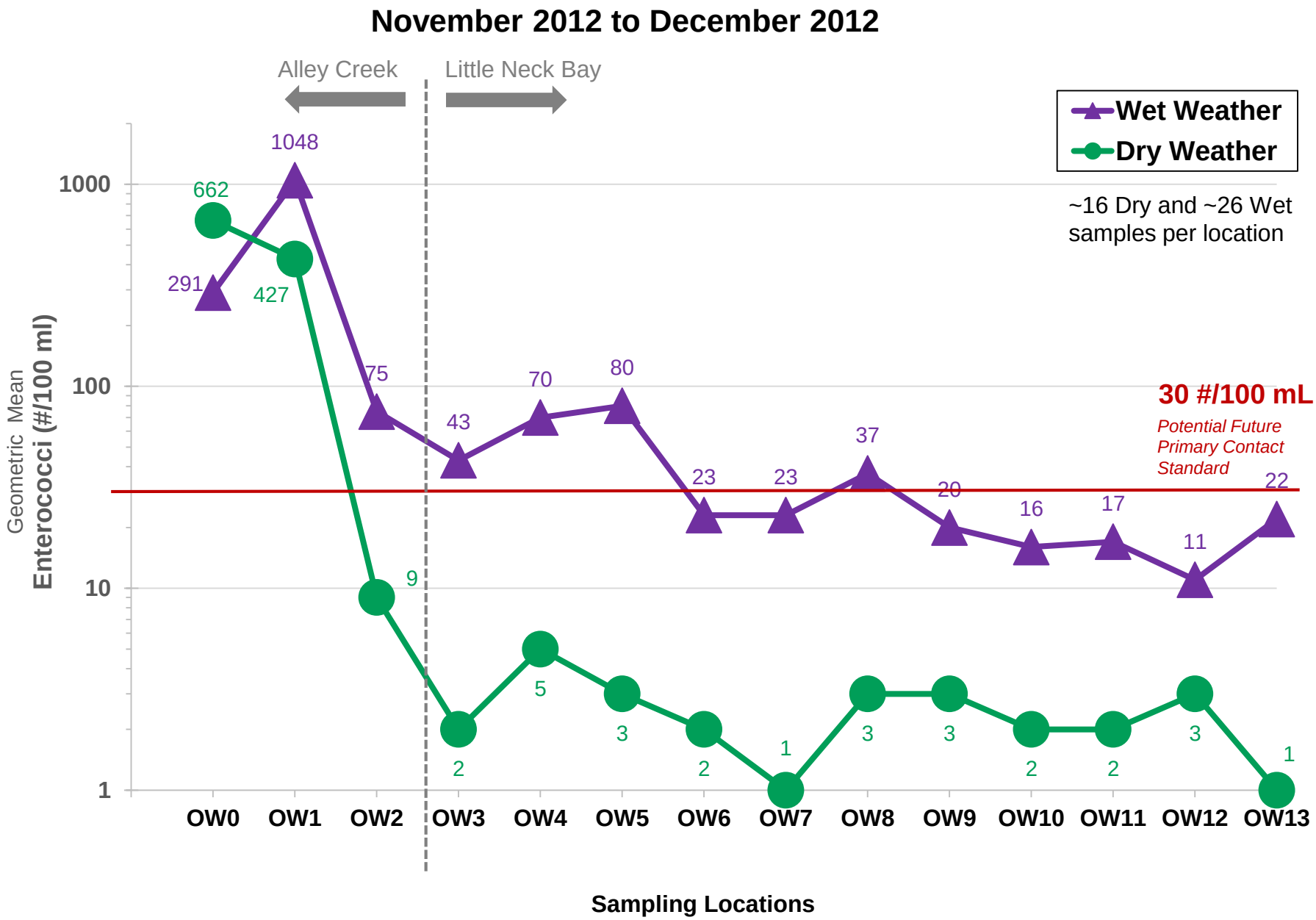


Fecal Coliform: Pre-Tank vs. Post-Tank



Reduced Fecal Coliform Levels through
Implementation of 5 MG CSO Retention Facility (Tank)

Enterococci Results



CSO Mitigation Options

INCREASING COMPLEXITY

INCREASING COST

Source Control	**Additional Green Infrastructure**		**High Level Sewer Separation (HLSS)**	
System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Bending Weirs Control Gates	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping	
Ecological Enhancement	Floatables Control		Dissolved Oxygen Improvement	
Treatment	**Outfall Disinfection**	**Disinfection at Existing CSO Retention Facility**	High Rate Clarification (HRC)	
Storage	In-System	**Shaft**	**Enlarge Tank**	

Preferred Alternative

= Disinfection at Existing CSO Retention Facility

Questions?

LTCP Proposed Final Recommendations

Jim Mueller, P.E.
Assistant Commissioner
DEP

History of Chlorination

Chlorination of sewage remains the most common practice of wastewater disinfection today

1890's	• Became common practice in English municipal water treatment
1908	• Application proven effective in Chicago and Jersey City water districts
1910	• City of Philadelphia first to chlorinate wastewater in U.S.
1911	• First application in NYC for disinfection of Croton water supply
1918	• Over 1,000 U.S. cities use chlorination for drinking water supplies
1936	• First application in NYC for seasonal disinfection of wastewater effluent
Today	• Most widely-used disinfectant for water & wastewater treatment in the U.S.

CSO Disinfection

Disinfection with sodium hypochlorite (liquid chlorine) is practiced nationwide for CSO treatment

Key Benefits:

- Liquid chlorine is best suited for the intermittent and variable character of CSO discharges.
- Other disinfection methods are not as effective, reliable or economical.
- Extensive experience nationwide for CSO treatment.
- NYCDEP has extensive experience in storing, handling, and applying chlorine at water and wastewater facilities.

Common Methods of Disinfection

	%Utilization across USA* (WWTPs > 1 mgd)	Benefits	Challenges
Chlorine	75.3 %	• Effective against a wide range of pathogens • Relatively inexpensive	• Residual chlorine can be toxic to some aquatic life
UV	20.6 %	• Effective against a wide range of pathogens	• Relatively expensive • Energy intensive • Requires larger footprint than chlorination • Not as effective as chlorine for CSO disinfection
Ozone	0.2 %	• Highly effective against a wide range of pathogens	• Relatively expensive • Energy intensive • Requires larger footprint than chlorination • Not used for CSO disinfection
None	3.9 %	-	-

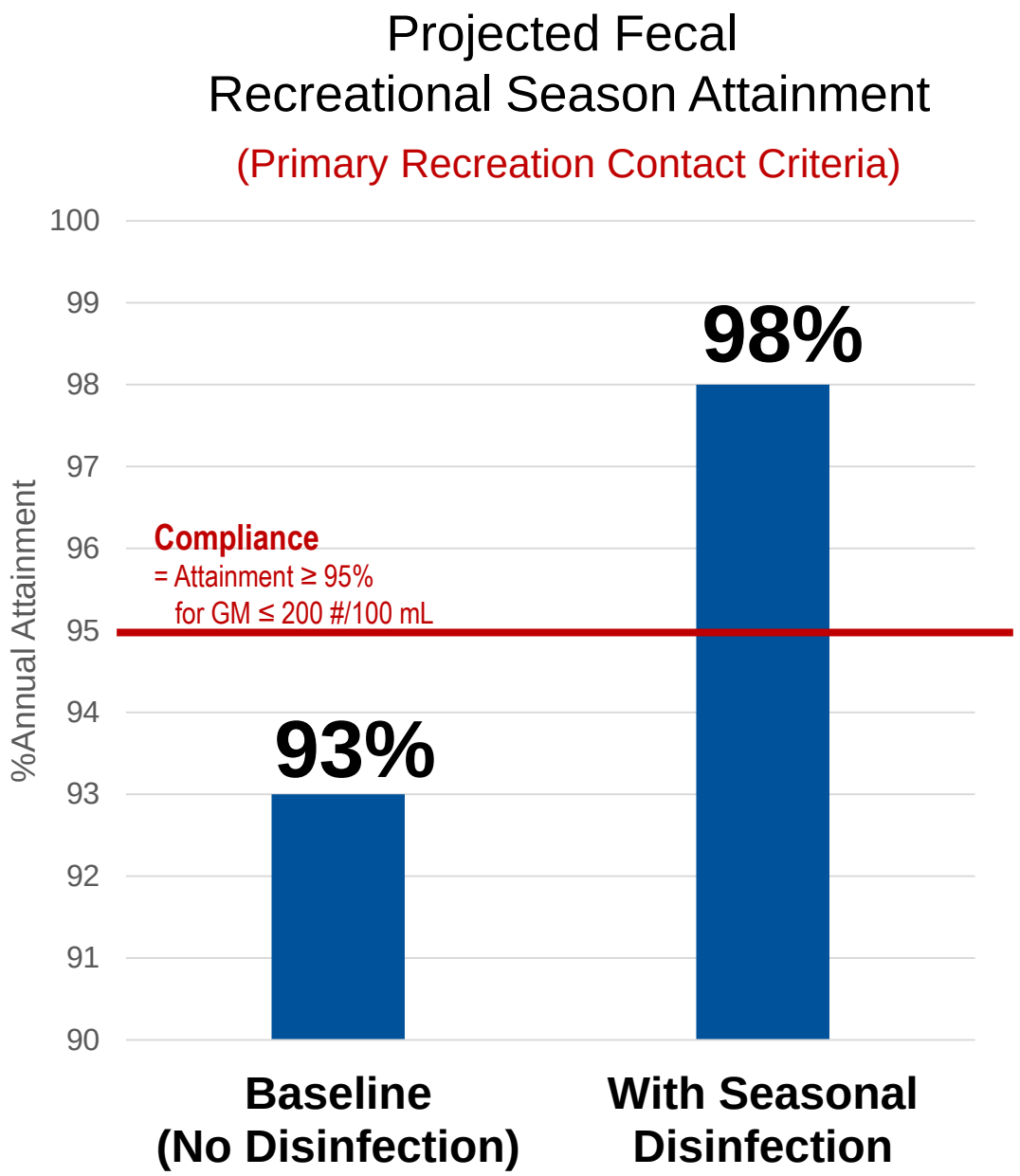
Pathogens = disease causing organisms

*Source: Disinfection of Wastewater Effluent – Comparison of Alternative Technologies, WERF, 2008.

CSO Disinfection for Alley Creek

Seasonal disinfection is needed to:

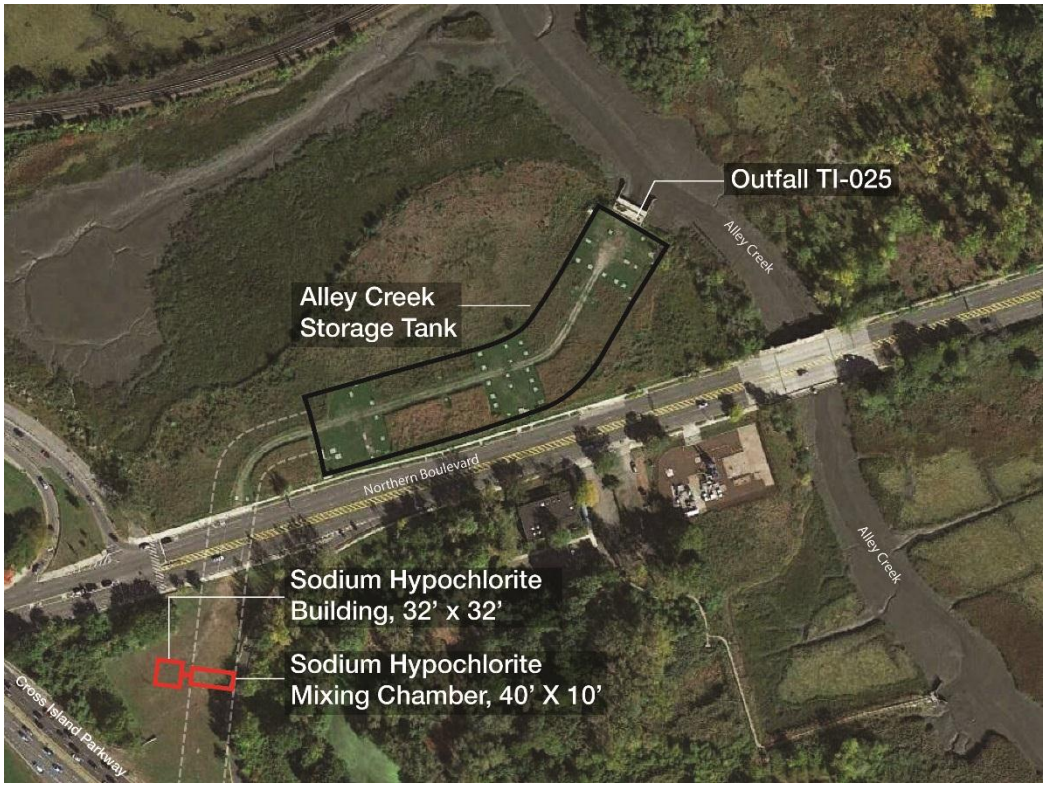
- **Achieve swimmable goals** during recreational season
- **Reduce human-sourced bacteria** discharged to Alley Creek



Preferred Alternative

Disinfect at the Existing 5 MG CSO Retention Facility during Recreational Season (May 1st – Oct 31st)

- **Benefits:**
  - Reduce Bacteria Load to Creek
  - Small Footprint
  - Does not require structural modifications to existing tank
- **Challenges:**
  - Site Acquisition
  - Additional O&M Requirements
  - Control of Residual Chlorine
- **Total Capital Cost / Annual O&M**
  - **$7.6 M / $250 K**



Residual Chlorine Management

Two commonly used options:

1) Instrumentation: to closely monitor & control chlorine dosage

2) Dechlorination: add additional chemical (sodium bisulfite) to quench residual chlorine

Spring Creek Pilot

To be completed ***in time*** to **inform final design and control requirements** for proposed disinfection facilities

- Test and measure chlorine residuals and potential toxicity to receiving waters
- Determine proper disinfection control protocols and potential dosage ranges
- Determine if dechlorination may be required based upon potential toxicity issues

Projected **Primary Contact** Attainment

Bacteria:

	Fecal (Monthly GM ≤ 200 #/100mL)				Enterococcus (30-Day Rolling GM ≤ 30 #/100mL)		
	Baseline	%100 CSO Control	Recommended Plan		Baseline	%100 CSO Control	Recommended Plan
	Annual	**Annual**	**Annual**	**Seasonal**	**Seasonal**	**Seasonal**	**Seasonal**
Little Neck Bay	97%	98%	97%	100%	87%	93%	89%
Alley Creek	87%	94%	90%	98%	44%	54%	48%

Compliance = Attainment ≥ 95%

Projected Dissolved Oxygen (DO) Attainment

Alley Creek:

Acute (Hourly) (Never < 4.0 mg/L)	
Baseline **Annual**	Recommended Plan **Annual**
98%	98%

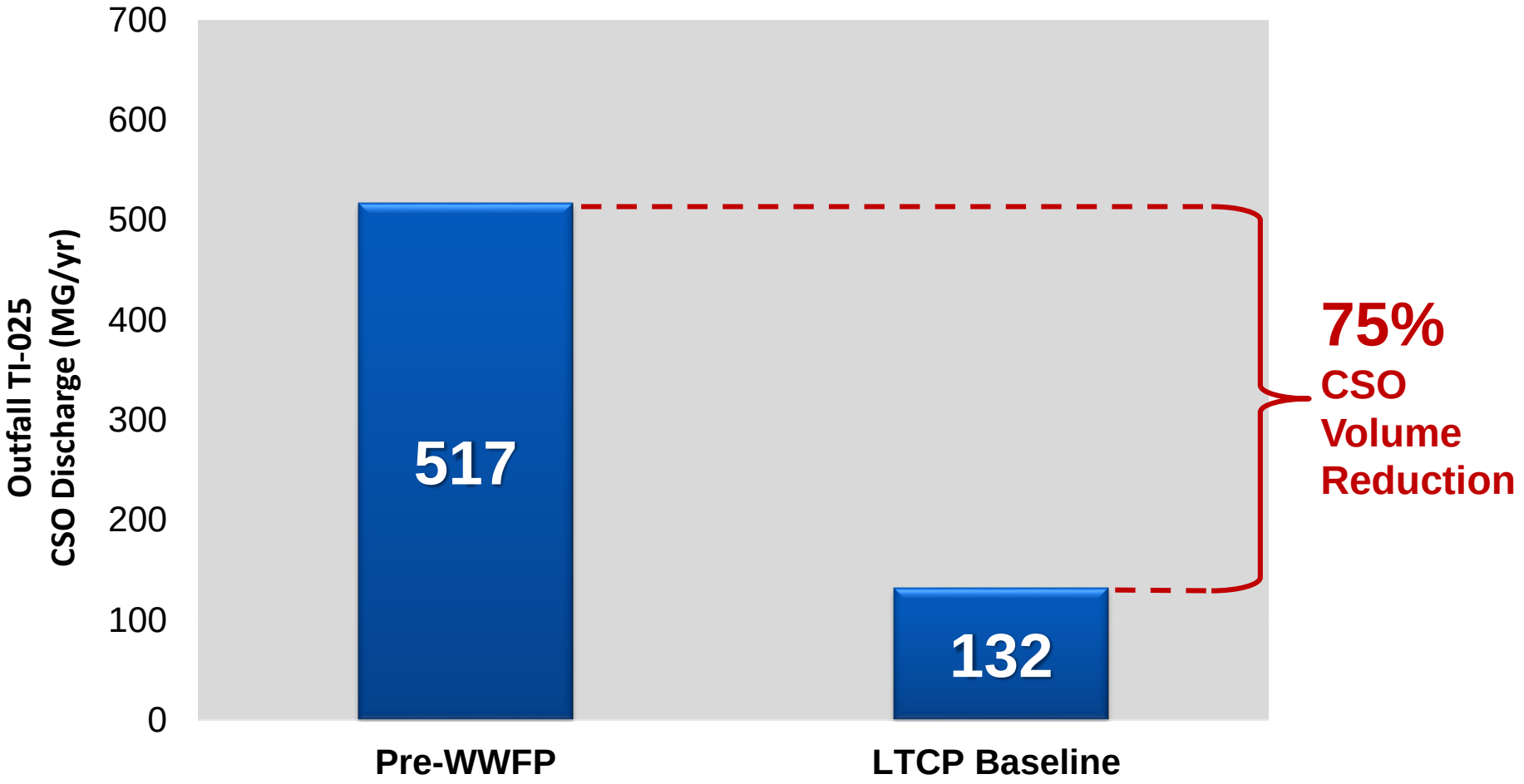
Compliance = Attainment ≥ 95%

Little Neck Bay:

Chronic (Daily) (Daily Average ≥ 4.8 mg/L)			Acute (Hourly) (Never < 3.0 mg/L)	
Baseline **Annual**	%100 CSO Control **Annual**	Recommended Plan **Annual**	Baseline **Annual**	Recommended Plan **Annual**
95%	96%	95%	99%	99%

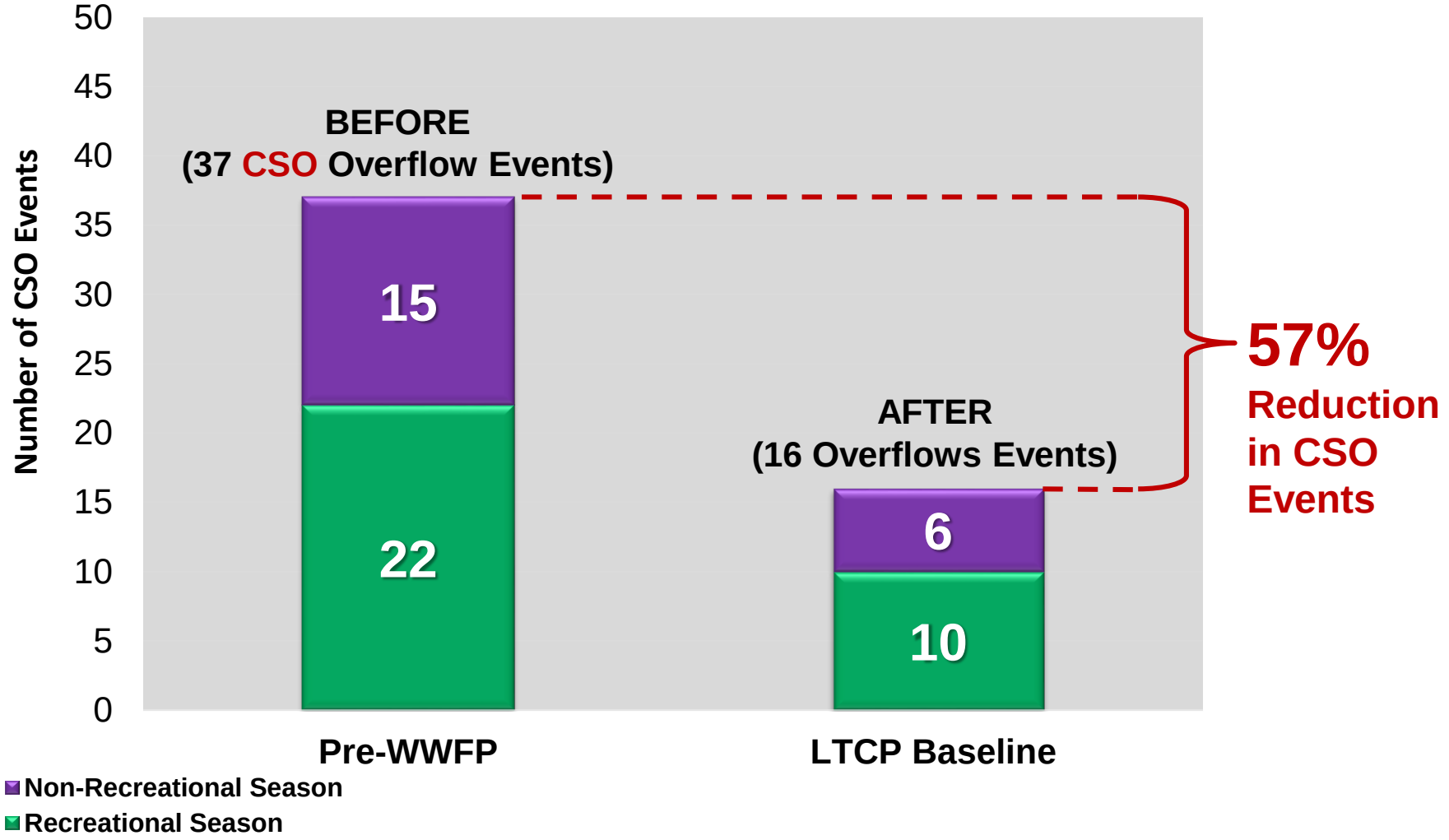
CSO Volume Reduction

- Volume Reduction: **75% annual CSO volume reduction** through completed / planned Grey and Green infrastructure implementation



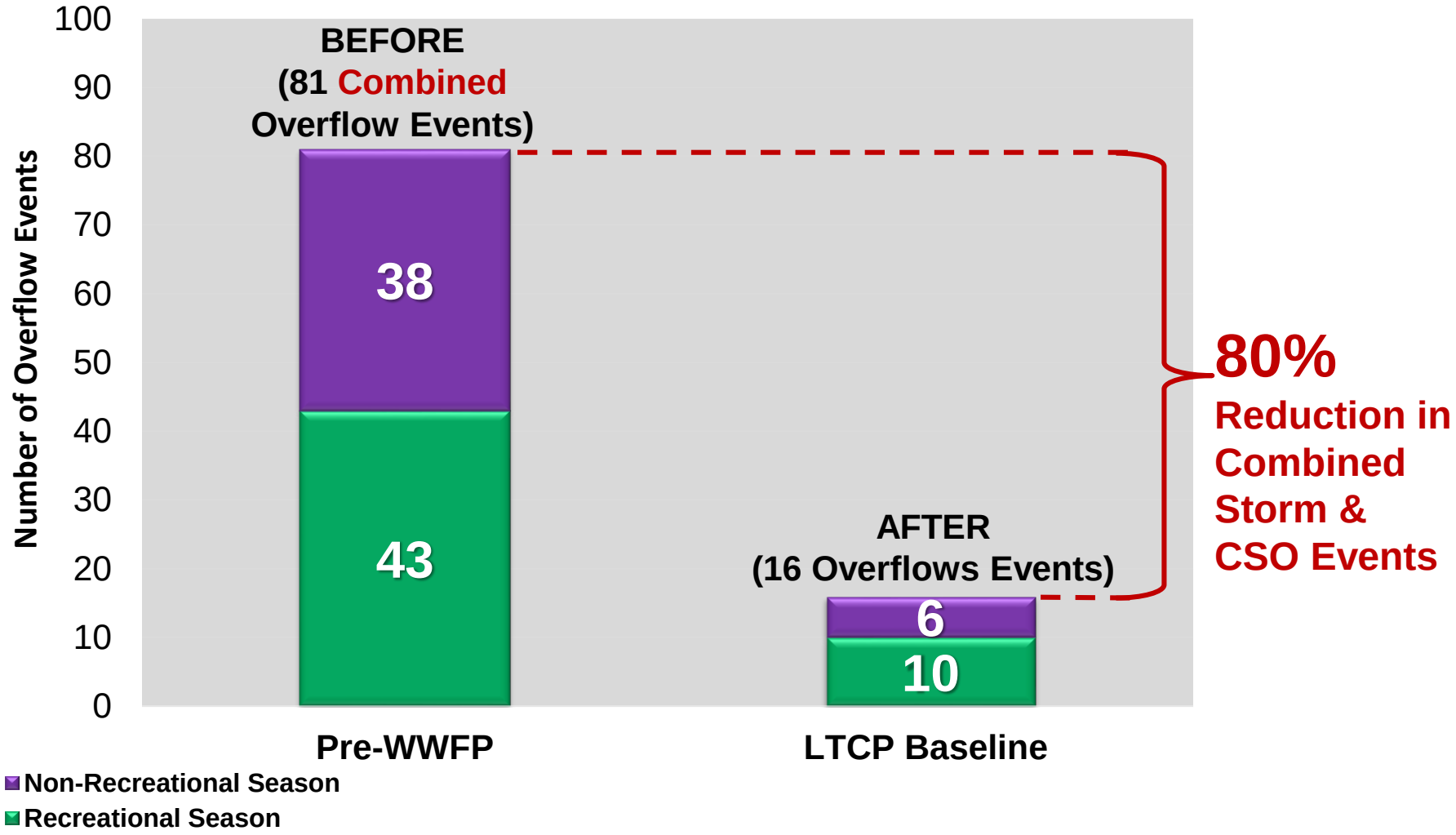
CSO: Overflow Frequency Reduction

- Frequency Reduction: **57% annual CSO frequency reduction** through completed / planned Grey and Green infrastructure implementation



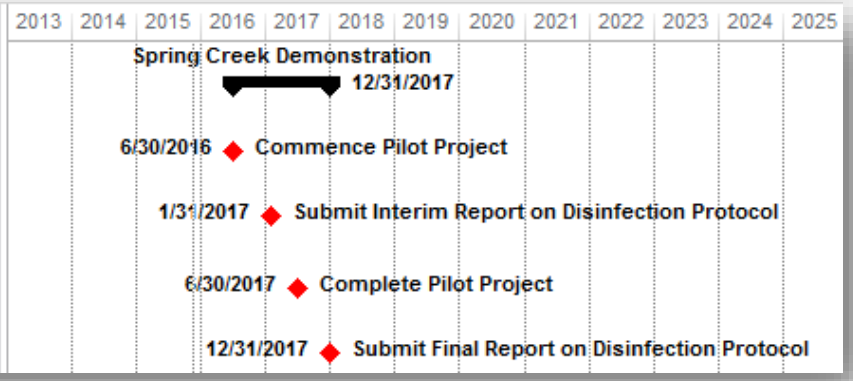
Combined Storm & CSO Frequency Reduction

- Frequency Reduction: **80% reduction in annual combined (storm & CSO) overflows** through completed / planned Grey and Green infrastructure implementation

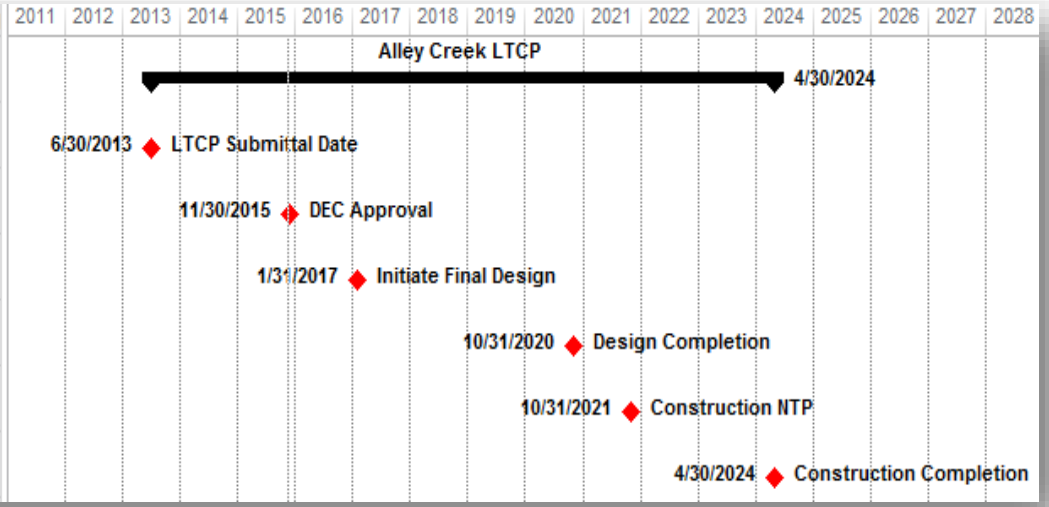


Tentative Implementation Schedule

	Task Name	Duration	Start	Finish
1	**Spring Creek Demonstration**	**393 days**	**Thu 6/30/16**	**Sun 12/31/17**
2	Commence Pilot Project	0 days	Thu 6/30/16	Thu 6/30/16
3	Submit Interim Report on Disinfection Protocol	0 days	Tue 1/31/17	Tue 1/31/17
4	Complete Pilot Project	0 days	Fri 6/30/17	Fri 6/30/17
5	Submit Final Report on Disinfection Protocol	0 days	Sun 12/31/17	Sun 12/31/17



	Task Name	Duration	Start	Finish
1	**Alley Creek LTCP**	**2829 days**	**Sun 6/30/13**	**Tue 4/30/24**
2	LTCP Submittal Date	0 days	Sun 6/30/13	Sun 6/30/13
3	DEC Approval	0 days	Mon 11/30/15	Mon 11/30/15
4	Initiate Final Design	0 edays	Tue 1/31/17	Tue 1/31/17
5	Design Completion	0 edays	Sat 10/31/20	Sat 10/31/20
6	Construction NTP	0 edays	Sun 10/31/21	Sun 10/31/21
7	Construction Completion	0 days	Tue 4/30/24	Tue 4/30/24



*This is the projected schedule pending DEC approval of the Alley Creek LTCP

LTCP Proposed Final Recommendations

- Continue to operate Alley Creek CSO Retention Facility
- Implement Preferred Alternative:
  - Seasonal disinfection at the Alley Creek CSO Retention Facility
- Initiate a post-construction compliance monitoring program
- Perform a Use Attainability Analysis (UAA) addressing non-compliance
- Establish a wet-weather advisory during the recreational season (May 1st – Oct 31st)

Time to Recovery

(Fecal Coliform Target of 1,000 cfu/100 mL)

Baseline	Post LTCP Recommended Plan
26 hours	10 hours

Questions?

Municipal Separate Storm Sewer (MS4) Program

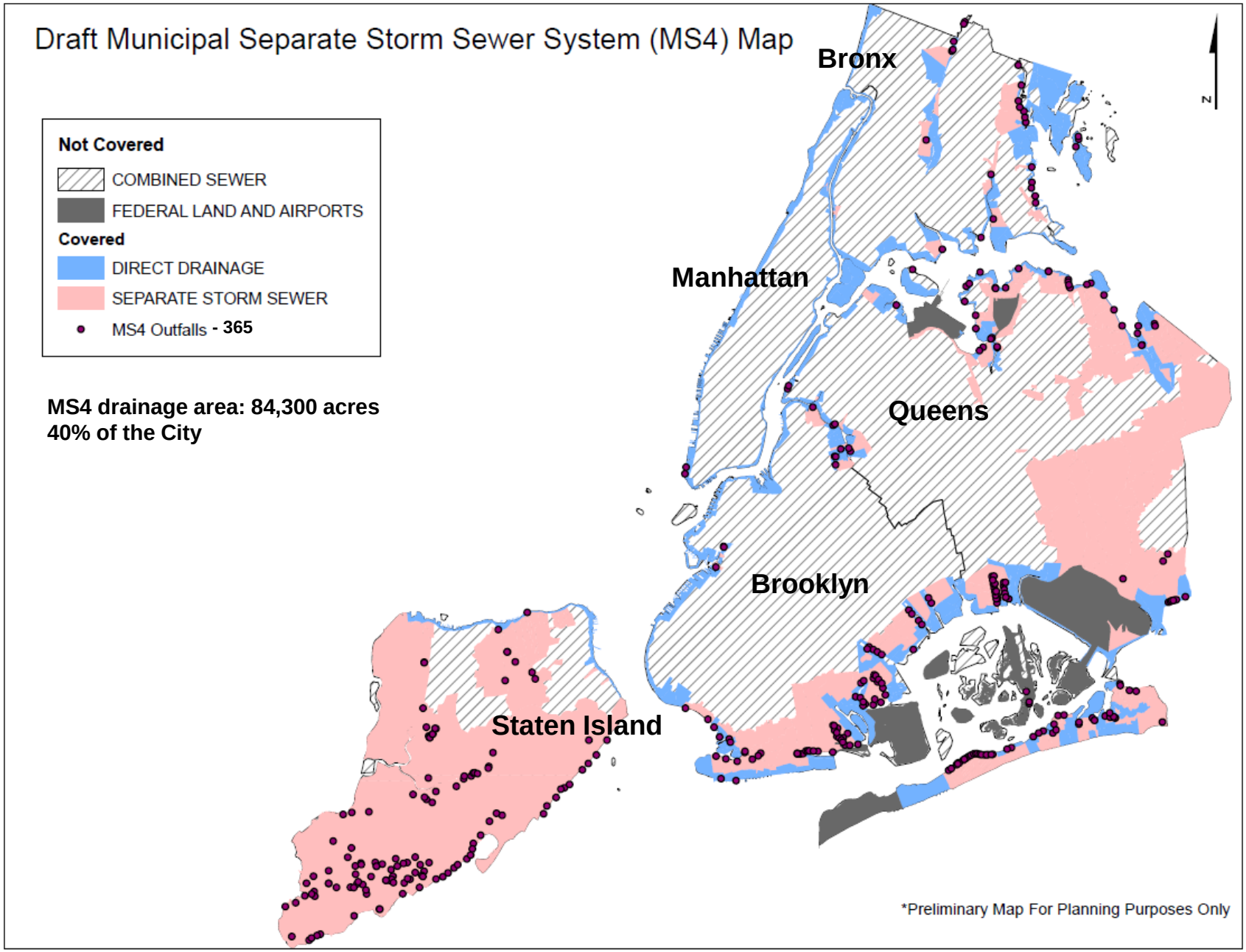
Pinar Balci
Director
DEP

Water Quality Improvement: MS4 and CSO

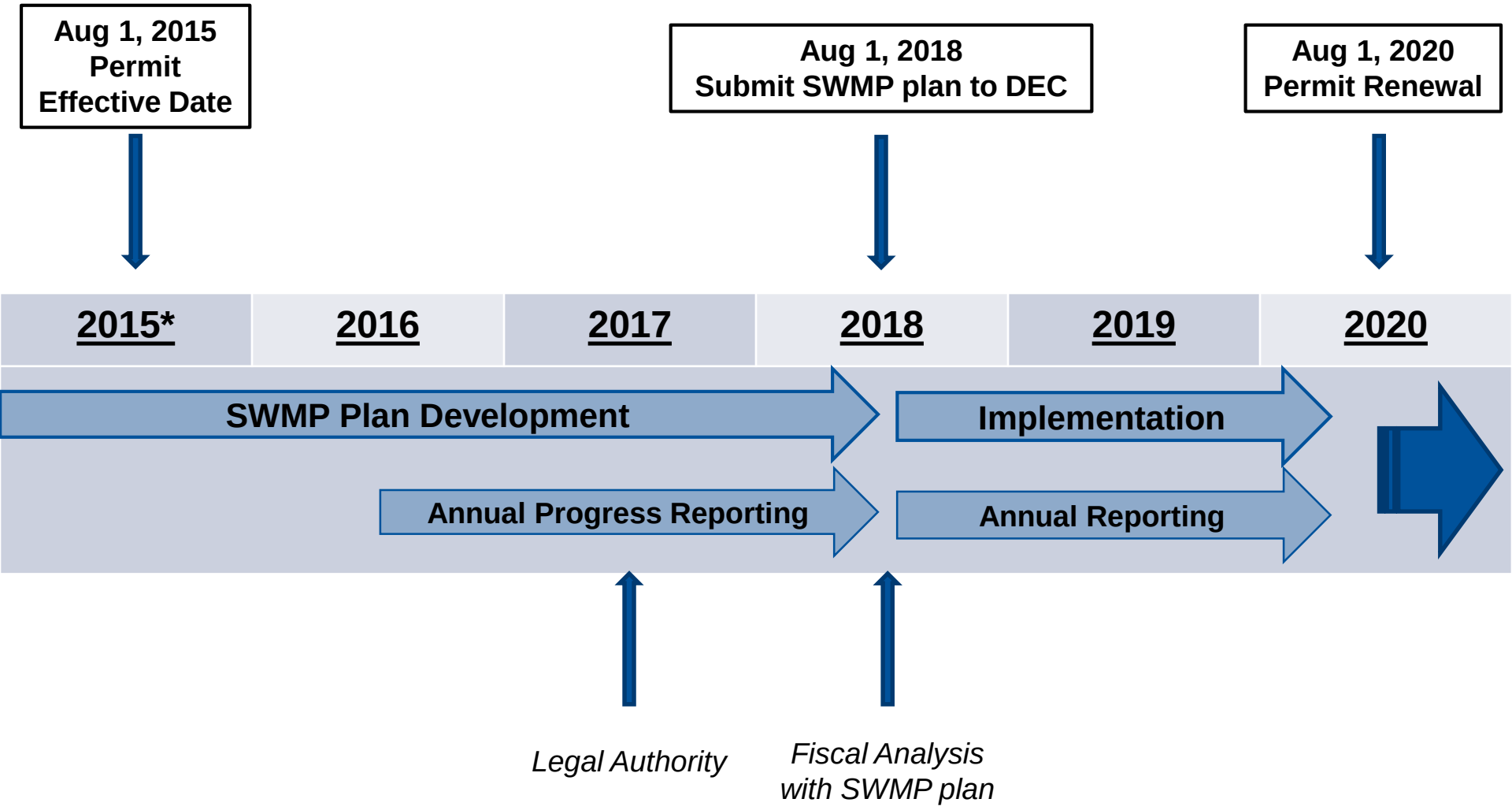
A Municipal Separate Storm Sewer System (MS4) is:

- a conveyance or system of conveyances;
- A system that is owned by a state, city, town, village, or other public entity that discharges to waters of the US;
- designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.);
- not a combined sewer; and
- not part of a Publicly Owned Treatment Works (sewage treatment plant).

Affected Areas of NYC under MS4 permit



MS4 Permit Timeline



*** - Calendar years***

MS4 Integration with the CSO Program

Requirements for Impaired Waters with Approved LTCPs

- Identify MS4 priority waterbodies
  - Waterbodies where an approved LTCP does not predict compliance with WQ standards and stormwater contributions from MS4 are expected to be a significant contributor
- Categorize sources of pollutants discharging to the MS4 priority waterbodies
- Identify additional or customized non-structural BMPs and a schedule to commence implementation
- Describe opportunities for implementing green infrastructure pilot projects and other structural retrofits

Questions?

Next Steps

Ibrahim Abdul-Matin
Director of Community Affairs
DEP

Next Steps

- Public Comments will be accepted for Alley Creek and Little Neck Bay through December 17th, 2015

- Comments can 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