Bronx River
Combined Sewer Overflow
Long Term Control Plan

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.
What is a Long Term Control Plan?

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
What is a CSO Consent Order?

CSO Consent Order

an agreement that settles past legal disputes without prolonged litigation

requires DEP to develop LTCPs and mitigate CSOs
LTCP Process and Public Involvement

Bronx Borough President Meeting
1/22/15

Existing Information Review

Data Collection & Analysis

Modeling

Alternatives Development & Evaluation

LTCP

 Kickoff Meeting
2/12/15

Alternatives Meeting
Spring 2015

Final Plan Review Meeting TBD

LTCP Due
6/30/15

DEC Review

ONGOING PUBLIC/STAKEHOLDER INPUT
Public Participation

 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**:

<table>
<thead>
<tr>
<th>Section</th>
<th>Class</th>
<th>Dissolved Oxygen (mg/l)</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fecal Coliform (col/100 ml)</td>
</tr>
<tr>
<td><strong>Freshwater</strong></td>
<td>Class B</td>
<td>&gt; 5.0 (daily avg.)</td>
<td>≤ 200 (Monthly GM)</td>
</tr>
<tr>
<td>NORTH of E. Tremont Ave.</td>
<td></td>
<td>≥ 4.0</td>
<td></td>
</tr>
<tr>
<td><strong>Tidal</strong></td>
<td>Class I</td>
<td>≥ 4.0</td>
<td>≤ 2,000* (Monthly GM)</td>
</tr>
<tr>
<td>SOUTH of E. Tremont Ave.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: New DEC proposed rulemaking for primary contact criteria for Class I and Class SD of ≤ 200 col/100 ml for Fecal Coliform.*
Drainage Area & Land Use Distributions

Freshwater Section

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park &amp; Open Space</td>
<td>95%</td>
</tr>
<tr>
<td>Transportation &amp; Utility</td>
<td>3%</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.6%</td>
</tr>
<tr>
<td>Public Facility</td>
<td>0.6%</td>
</tr>
<tr>
<td>Residential &amp; Commercial</td>
<td>0.5%</td>
</tr>
<tr>
<td>Other</td>
<td>0.3%</td>
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</tbody>
</table>

Freshwater Section Maps

Tidal Section

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential &amp; Commercial</td>
<td>58%</td>
</tr>
<tr>
<td>Transportation &amp; Utility</td>
<td>10%</td>
</tr>
<tr>
<td>Public Facility</td>
<td>10%</td>
</tr>
<tr>
<td>Park &amp; Open Space</td>
<td>9%</td>
</tr>
<tr>
<td>Industrial</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>11%</td>
</tr>
</tbody>
</table>

Tidal Section Maps

LEGEND
- Residential
- Mixed Residential and Commercial
- Commercial and Office
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- Other
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
Tidal Section – Current Uses

- **Parks & Boat Access Points**
  (Contains kayak/canoe launch site)
  1. West Farms Rapids
  2. Starlight Park
  3. Concrete Plant Park
  4. Hunts Point Riverside Park
  5. Soundview Park

- **Upcoming Development**
  - Hunts Point Vision Plan
- 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 (〇)
  - Primarily direct drainage

- Tidal Section:
  - 5 CSO Outfalls (▵)
  - No MS4 Outfalls

<table>
<thead>
<tr>
<th></th>
<th>NYC</th>
<th>Westchester</th>
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<tr>
<td>Drainage Area (Acres)</td>
<td>4,318</td>
<td>23,020</td>
</tr>
<tr>
<td>Served by Combined Sewers</td>
<td>64%</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Modeled Bronx River CSO Volumes

Pre-WWFP

LTCP Baseline w/ GI

Approx. 10% reduction

CSO Discharge Volume (MGY)

HP-004  HP-007  HP-008  HP-009

454  41  11  2

413  32  9  1
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 17th, 2014 to July 17th, 2014)

Freshwater

Tidal

~12 Dry and ~34 Wet samples per location

<table>
<thead>
<tr>
<th>Location</th>
<th>Fecal Coliform (#/100 ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BR1</td>
<td>2631</td>
</tr>
<tr>
<td>BR2</td>
<td>2651</td>
</tr>
<tr>
<td>BR3</td>
<td>1763</td>
</tr>
<tr>
<td>BR4</td>
<td>1543</td>
</tr>
<tr>
<td>BR5</td>
<td>2232</td>
</tr>
<tr>
<td>BR6</td>
<td>2019</td>
</tr>
<tr>
<td>BR7</td>
<td>794</td>
</tr>
<tr>
<td>BR8</td>
<td>617</td>
</tr>
<tr>
<td>BR9</td>
<td>239</td>
</tr>
</tbody>
</table>

Geometric Mean

Future primary contact standard
New York City Enterococci Results

(May 17th, 2014 to July 17th, 2014)

~12 Dry and ~34 Wet samples per location

Freshwater

Tidal

Geometric Mean Enterococci (#/100 ml)

Sampling Locations

<table>
<thead>
<tr>
<th>BR1</th>
<th>BR2</th>
<th>BR3</th>
<th>BR4</th>
<th>BR5</th>
<th>BR6</th>
<th>BR7</th>
<th>BR8</th>
<th>BR9</th>
</tr>
</thead>
<tbody>
<tr>
<td>931</td>
<td>876</td>
<td>684</td>
<td>496</td>
<td>616</td>
<td>391</td>
<td>77</td>
<td>52</td>
<td>16</td>
</tr>
<tr>
<td>110</td>
<td>58</td>
<td>98</td>
<td>36</td>
<td>40</td>
<td>30</td>
<td>30</td>
<td>52</td>
<td>16</td>
</tr>
</tbody>
</table>

30 #/100 ml

future primary contact standard

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Environmental Protection
4 Illicit Discharges:
(between BR0 and BR1)

Yonkers Avenue
Raybrook Road
Glen Road
McLean Avenue
Illicit Discharge Reduction & Water Quality Improvement

**Freshwater**

- **2006 Dry Weather Data**: 9/22/06 to 2/8/07
- **2014 Dry Weather Data**: 5/17/14 to 7/17/14

**Tidal**

- **2000 #/100 ml**
- **200 #/100 ml**

**Sampling Locations**

- BR1, BR2, BR3, BR4, BR5, BR6, BR7, BR8, BR9

**Geometric Mean Fecal Coliform (#/100 ml)**

- **2006 Dry Weather Data**
- **2014 Dry Weather Data**

- **Future primary contact standard**
Westchester County Sampling Results

- **2 Sampling Locations**
  - **BR0** in Westchester County
  - **BR1** at County-NYC Boundary Line

- **Sampling Period:**
  - 2014: July 25th to Oct. 24th
  - Bi-weekly sampling

### Geometric Mean (#/100 ml)

<table>
<thead>
<tr>
<th></th>
<th>BR0 Dry</th>
<th>BR0 Wet</th>
<th>BR1 Dry</th>
<th>BR1 Wet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Coliform</td>
<td>672</td>
<td>1545</td>
<td>701</td>
<td>2478</td>
</tr>
<tr>
<td>Enterococci</td>
<td>139</td>
<td>421</td>
<td>315</td>
<td>640</td>
</tr>
</tbody>
</table>
Water Quality Improvement Projects

Green Infrastructure

Mikelle Adgate
Project Manager
DEP
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 sewer 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
- Green Roof
- Bioswales
- Rain Garden
### GI Milestones and Program Focuses

<table>
<thead>
<tr>
<th>Year Interval</th>
<th>2011-2015</th>
<th>2016-2020</th>
<th>2021-2025</th>
<th>2026-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.5%</strong></td>
<td></td>
<td><strong>4%</strong></td>
<td><strong>7%</strong></td>
<td><strong>10%</strong></td>
</tr>
</tbody>
</table>

#### Heavy ROW Focus
*Inter-agency partnerships, ROW design standards, Area-wide approach for design, construction & maintenance*

- **2011-2015**: Continuing Focus on ROW Projects
- **2016-2020**: Continuing work on ROW Projects
- **2021-2025**: Continuing work on ROW Projects
- **2026-2030**: All work continuing until 10% target is reached

#### Early Projects/Queue future projects
*Site screening and analysis, design construct projects with DPR, NYCHA, and DOE*

- **2011-2015**: Greater Onsite implementation
- **2016-2020**: Further design and construction, Ongoing site screening and analysis
- **2021-2025**: Continued Onsite implementation
- **2026-2030**: All work continuing until 10% target is reached

#### Planning/Analysis for additional GI tools
*Pilot construction and monitoring*

- **2011-2015**: Continued analysis and monitoring
- **2016-2020**: R&D Program
- **2021-2025**: R&D Program
- **2026-2030**: Continued implementation of innovative designs and GI tools

#### Innovative design and development

- **2011-2015**: Further development of new tools
- **2016-2020**: R&D Program
- **2021-2025**: R&D Program
- **2026-2030**: R&D Program

### Related LTCP Milestones
- 2016 Performance Metrics Report
- 2017 Citywide LTCP
GI Opportunities for Private Property Owners

- **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
LTCP Process

On-Going
- Existing Information Review
- Data Collection & Analysis
- Modeling
- Alternatives Development & Evaluation
- LTCP

In-Progress

Kickoff Meeting

Alternatives Meeting

Final Plan Review Meeting

LTCP Due

ONGOING PUBLIC/STAKEHOLDER INPUT

DEC Review
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

<table>
<thead>
<tr>
<th>System Optimization</th>
<th>Fixed Weir</th>
<th>Parallel Interceptor / Sewer</th>
<th>Inflatable Dams Bending Weirs Control Gates</th>
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<td>Centralized:</td>
<td>WWTP Expansion</td>
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<td></td>
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Grey Infrastructure

- **Floatables Control**
  - **In-Line Netting Facilities**
    at CSO Outfalls HP-004 & HP-009
  - **Mechanical Screens**
    at Regulators CSO27 & 27A

- **Construction Cost ~ $47M**
- **Completed in June 2012**
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

Increasing CSO Reduction

- 100% Storage
- 75% Treatment
- 50% System Optimization
- 25% Source Control
## CSO Mitigation Options for HP-007

### INCREASING COMPLEXITY

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*NOTE: Floatables Control is already provided at HP-007.*
HP-007 and Regulators 27/27A

- Outfall HP-007
- Regulator 27
- Combined Sewer
- Regulator 27A
- Outfall Disinfection
- Interceptor Relief
## CSO Mitigation Options for HP-009

### INCREASING COMPLEXITY

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*NOTE: Floatables Control is already provided at HP-009.*
### CSO Mitigation Options for HP-011

#### INCREASING COMPLEXITY

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#### INCREASING COST

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</table>
Regulator 5

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
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
Open Discussion