Westchester Creek
Combined Sewer Overflow
Long Term Control Plan

Public Meeting #2
Herbert H. Lehman High School
May 7, 2014
Welcome & Introductions

Shane Ojar
DEP
<table>
<thead>
<tr>
<th>Topic</th>
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<tr>
<td>1  Welcome and Introductions</td>
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<td>2  Long Term Control Plan (LTCP) Process</td>
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<td>3  Waterbody/Watershed Characteristics</td>
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<td>4  Water Quality – Current Improvement Projects</td>
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<td>5  Draft Alternatives for LTCP</td>
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<td>6  Next Steps</td>
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<td>7  Discussion and Q&amp;A Session</td>
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Overview of Combined Sewer Overflow
Long Term Control Plan Process

Lily Lee, P.E.
DEP
What is a Long Term Control Plan?

- Required under NYC SPDES permits in accordance with the Clean Water Act (CWA) and Federal CSO Control Policy.
- Comprehensive evaluation of alternatives to reduce CSOs and improve water quality in NYC’s waterbodies.

The Long Term Control Plan Process:

- Assesses feasibility of attaining current water quality standards and fishable/swimmable standards;
- Builds off Waterbody/Watershed Facility Plans (WWFP);
- Identifies grey-green* infrastructure balance for different watersheds; and
- Requires robust, targeted public process.

*Green: sustainable pollution reducing practices that also provide other ecosystem services.

*Grey: traditional practices such as pipes and sewers.
Public Involvement and LTCP Process

Existing Information Review → Data Collection & Analysis → Modeling → Alternatives Development & Evaluation → LTCP → DEC Review

Kickoff Meeting (February 2014)

Alternatives Meeting (May 2014)

Final Plan Review Meeting

ONGOING PUBLIC/STAKEHOLDER INPUT

LTCP due 6/30/2014
Waterbody & Watershed Characteristics

*Lily Lee, P.E.*

DEP
Current Water Quality Standards

- Best Use Designations
- Saline Surface Water Quality Standards (WQS)

**Westchester Creek – Class I**
- Dissolved Oxygen (DO) ≥ 4.0 mg/L
- Fecal Coliform ≤ GM 2,000/100 mL
- Total Coliform ≤ GM 10,000/100 mL
Westchester Creek Waterbody Characteristics

- From Lehman High School to the Whitestone Bridge, including Pugsley Creek to the west
- Classified for secondary contact recreation (I), boating and fishing; similar existing uses
  - 100% attainment of fecal coliform criterion (monthly GM < 2,000 cfu/100 mL)
  - Dissolved oxygen modeling not complete, but minimum winter DO measurement = 7.61 mg/L (WQS is never less than 4 mg/L)
Westchester Creek Drainage Area Characteristics

- Wet weather discharges
  - 6 CSO Outfalls
  - 12 Stormwater Outfalls

- Majority of CSO discharges at head end near Lehman HS (HP-014)
Existing Recreational Uses identified during Public Meeting No. 1:

- Fishing
- Swimming
- Wading
- Kayaking
- Wildlife Observation and Hiking
- Camping

Proposed EDC project identified at Public Meeting No. 1: Access to Creek by Trail for aesthetic purposes
Westchester Creek: Open Water Sampling Results

- Enhanced Harbor Survey Program Data
  - Weekly sampling from mid-December 2013 through end of April 2014
  - 16 sampling events, 8 during dry weather, 8 during wet weather (64 total samples)
- Data show FULL ATTAINMENT of current standard (fecal < 2,000)

<table>
<thead>
<tr>
<th>Station</th>
<th>FECAL</th>
<th>ENTERO</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>GM (Dry)</td>
<td>GM (Wet)</td>
</tr>
<tr>
<td>WC2</td>
<td>97</td>
<td>559</td>
</tr>
<tr>
<td>WC1</td>
<td>76</td>
<td>277</td>
</tr>
<tr>
<td>WC3</td>
<td>9</td>
<td>43</td>
</tr>
<tr>
<td>E13</td>
<td>5</td>
<td>23</td>
</tr>
</tbody>
</table>

Entero data provided to show current conditions.
No Entero Standard applies to Class I water
Westchester Creek Water Quality – Current Improvement Projects

- Weir Modification
- Pugsley Parallel Sewer
- Green Infrastructure
Westchester Creek: Current Improvement Projects

- Parallel relief sewer to divert CSO away from Pugsley Creek
  Cost = $66 million

- Weir Modifications to regulators CSO-29A and CSO-29
  Cost = $13.6 million

- Green Infrastructure
  Cost = $20 million
Westchester Creek: Current Improvement Projects

- **Weir Modification/Pugsley Parallel Relief Sewer:**
  - Construction of these projects to be completed in 2019

- **Green Infrastructure:**
  - DEP’s partnering agency, the Economic Development Corporation (EDC), will begin the design for right-of-way green infrastructure in Westchester Creek in Summer 2014.
  - Area-wide contract allows DEP to:
    - Focus resources on these specific outfall tributary areas
    - Saturate these areas with as much GI as possible
    - Achieve efficiencies in design and construction
Westchester Creek: Modeling Baseline

64% reduction of CSO

(After Current Improvement Projects)
Westchester Creek Contributing Sources (with Baseline Projects Implemented)

With implementation of the WWFP and green infrastructure, stormwater contribute a larger portion of Enterococci than remaining CSOs.
Summary of Water Quality Considerations

- **Existing WQS – Secondary Contact (Class I)**
  - Attainment with existing planned projects (Baseline)

- **Next Higher Use – Primary Contact (Current Class SB)**
  - At Baseline: very high to full **summer** attainment with fecal coliform and entero standards
  - At Baseline: **annual** attainment with fecal coliform or entero standards not reached
  - Complete CSO elimination provides some improvements over baseline, but would not result in annual attainment of SB criteria
  - East River is not in full attainment, limiting complete attainment in Westchester Creek
  - Stormwater inputs into Westchester Creek also limits reaching full SB attainment

- **Next Higher Use (Class SB) With Proposed 2015 Modification**
  - At Baseline: significant non-attainment
  - Complete CSO elimination provides small improvement over baseline
Alternatives Evaluation for Westchester Creek

Lily Lee, P.E.
DEP
Westchester Creek: Alternatives Considered

- In-Line Storage at HP-014
- Disinfection at HP-014
- Upsizing Throgs Neck PS
- Storage Tunnels
- Floatables Control
- Additional Green Infrastructure Build-out
- Dredging
- Based on 2002-2011 (10-yr)

### Westchester Creek: Alternatives Considered

<table>
<thead>
<tr>
<th>BASELINE Attainment (Starting Point)</th>
<th>CURRENT USE (Class I)</th>
<th>NEXT HIGHER USE (Class SB)</th>
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<tbody>
<tr>
<td>SUMMER</td>
<td>ANNUAL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fecal</td>
<td>Entero</td>
</tr>
<tr>
<td>Head End (WC2)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Bruckner Blvd (WC1)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Mid-Length (WC3)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>East River (E13)</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Westchester Creek: Alternatives Considered

<table>
<thead>
<tr>
<th>Max Potential Increase in Attainment (100% CSO Control)</th>
<th>CURRENT USE (Class I)</th>
<th>NEXT HIGHER USE (Class SB)</th>
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<tbody>
<tr>
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<tr>
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<td>Entero</td>
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<tr>
<td>WC2</td>
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<tr>
<td>WC1</td>
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<td>-</td>
</tr>
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<td>-</td>
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<td>E13</td>
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Based on 2002-2011 (10-yr)
Concept: Use existing outfall HP-014 for CSO storage, then pump stored CSO back to the sewers after it rains.

Benefits
- Reduces CSO by 67 MG (23%)
- Increases attainment of next higher use < 6 percentage points

Estimated Cost
- $42 Million

Challenges
- Siting, building, and operating a new 5.9 MGD pump station and 1,000 ft. long force main for pump-back near the Lehman HS athletic fields
- Access to pipe beneath NYTA rail yard during construction and 24/7 during operation
- Operation and maintenance

<table>
<thead>
<tr>
<th>Attainment (2008)</th>
<th>NEXT HIGHER USE (Class SB)</th>
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<tbody>
<tr>
<td></td>
<td>SUMMER</td>
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<td></td>
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<tr>
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<td>100%</td>
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<tr>
<td>E13</td>
<td>100%</td>
</tr>
</tbody>
</table>

Increases in attainment are shown in GREEN

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
Concept: Add disinfection and dechlorination facilities to HP-014 in-line storage

- **Benefits**
  - Reduces CSO load by 44%
  - Increases attainment of next higher use about 5 percentage points

- **Estimated Cost**
  - $53 Million

- **Challenges**
  - May negatively impact ecosystem
    - Difficult to control chlorine dosing to reduce pathogens and avoid fish kills
  - Ongoing operation and maintenance
  - Chemical delivery
  - Siting would be a challenge

<table>
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<tr>
<td></td>
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</tr>
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</tr>
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</tr>
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</table>

Increases in attainment are shown in **GREEN**
Concept: Expand the existing 37.5 MGD pump station and relocate the discharge away from Westchester Creek

- **Benefits**
  - Reduces CSO volume by 19%
  - Increases attainment of next higher use by no more than 3 percentage points

- **Costs**
  - $48 - $215 Million

- **Challenges**
  - Requires new building and a 3.13-mi 48-in force main
  - Disruption of local roadways during construction
  - CSO partially relocated to other waterbodies

### Table: Attainment (2008) and NEXT HIGHER USE (Class SB)

<table>
<thead>
<tr>
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<th>SUMMER</th>
<th>ANNUAL</th>
</tr>
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<tbody>
<tr>
<td>WC2</td>
<td>100%</td>
<td>79%</td>
</tr>
<tr>
<td>WC1</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>WC3</td>
<td>100%</td>
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<tr>
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<td>100%</td>
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Increases in attainment are shown in **GREEN**
Concept: Evaluate a range of alternatives up to 100% CSO capture per EPA policy requirements. Given volume requirements, use storage tunnels.

- **Benefits**
  - Evaluated 44%, 77%, 99%, and 100% reductions
  - Maximum WQ Improvement

- **Costs**
  - From $500 to over $700 Million

- **Challenges**
  - Significant long-term construction disturbance
  - Drop shafts must be close to outfalls
  - Pump station required to drain tunnel within 24 hours
  - Operation and maintenance

<table>
<thead>
<tr>
<th>TUNNEL OPTIONS</th>
<th>HP-014</th>
<th>HP-014</th>
<th>All but HP-013</th>
<th>All six outfalls</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSO Reduction</td>
<td>44%</td>
<td>77%</td>
<td>99%</td>
<td>100%</td>
</tr>
<tr>
<td>Tunnel Length (ft)</td>
<td>2,600</td>
<td>4,500</td>
<td>6,000</td>
<td>12,600</td>
</tr>
<tr>
<td>Tunnel Diameter (ft)</td>
<td>40</td>
<td>40</td>
<td>38</td>
<td>26</td>
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<tr>
<td>Cost ($M)</td>
<td>$509</td>
<td>$662</td>
<td>$754</td>
<td>$731</td>
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Increases in attainment are shown in **GREEN**
Concept: Where no CSO reduction is possible, consider retrofitting floatables control on outfall to reduce CSO impact to waterbody

- **Benefits**
  - Reduces CSO floatables load
  - May improve waterbody aesthetics

- **Costs**
  - ~$10 Million per outfall

- **Challenges**
  - Not a CSO reduction strategy
  - Does not increase WQS attainment
  - Siting would be a challenge
  - Operation and maintenance

NO CHANGES IN ATTAINMENT FROM BASELINE
Concept: Construct additional ROW bioswales beyond Baseline by 10% to reduce inflows to the combined sewers

❖ Benefits
  ➢ Reduces CSO by 42 MG (14%)
  ➢ Increases attainment of next higher use by < 4 percentage points

❖ Estimated Cost
  ➢ $20 Million

❖ Challenges
  ➢ Already at 14% GI target in this area for Baseline; finding more sites may be difficult
  ➢ Shallow bedrock in drainage area may limit GI effectiveness

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<tr>
<td>WC3</td>
<td>100%</td>
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<tr>
<td>E13</td>
<td>100%</td>
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Increases in attainment are shown in **GREEN**
Concept: where CSO sediment mounds are visible and above low tide, remove to 3 ft below MLLW

- **Benefits**
  - Aesthetics
  - May improve navigation

- **Costs**
  - Unknown at this time

- **Challenges**
  - No basis for environmental dredging per DEP guidelines
  - Navigational dredging the responsibility of USACE
  - Dredging will not reduce CSO discharges

NO CHANGES IN ATTAINMENT FROM BASELINE
Westchester Creek: Alternatives Considered

- In-Line Storage at HP-014 ($42 million)
- Disinfection ($53 million)
- Upsizing the Throgs Neck PS ($50 - $220 million)
- Storage Tank/Tunnel ($100 - 750 million)
- Floatables Control ($10 million)
- Additional Green Infrastructure ($20 million)
- Dredging (N/A)
Percent CSO Reduction vs Cost

Each Point is a different alternative

Cost (Capital and O&M), $ Millions

Baseline
In-Line Storage
Disinfection (pathogen reduction only/no CSO volume reduction)
Throgs Neck PS Upgrades
Storage Tunnels
Combinations
Next Steps

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DEP
Next Steps

- Public comments on alternatives due 5/21/2014

- Comments can be submitted to:
  - New York City DEP at: ltcp@dep.nyc.gov

- Westchester Creek LTCP Public Meeting #3
  - Objective & Topics: Present and review proposed Draft LTCP
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
- Real-time waterbody advisories
- Upcoming meeting announcements
- Other LTCP updates
Discussion and Q&A Session