Supplemental CSO Team – Session 3

PVSC Service Area
North Bergen MUA Service Area (Woodcliff Treatment Plant) Long Term Control Plan

April 11, 2017

Agenda

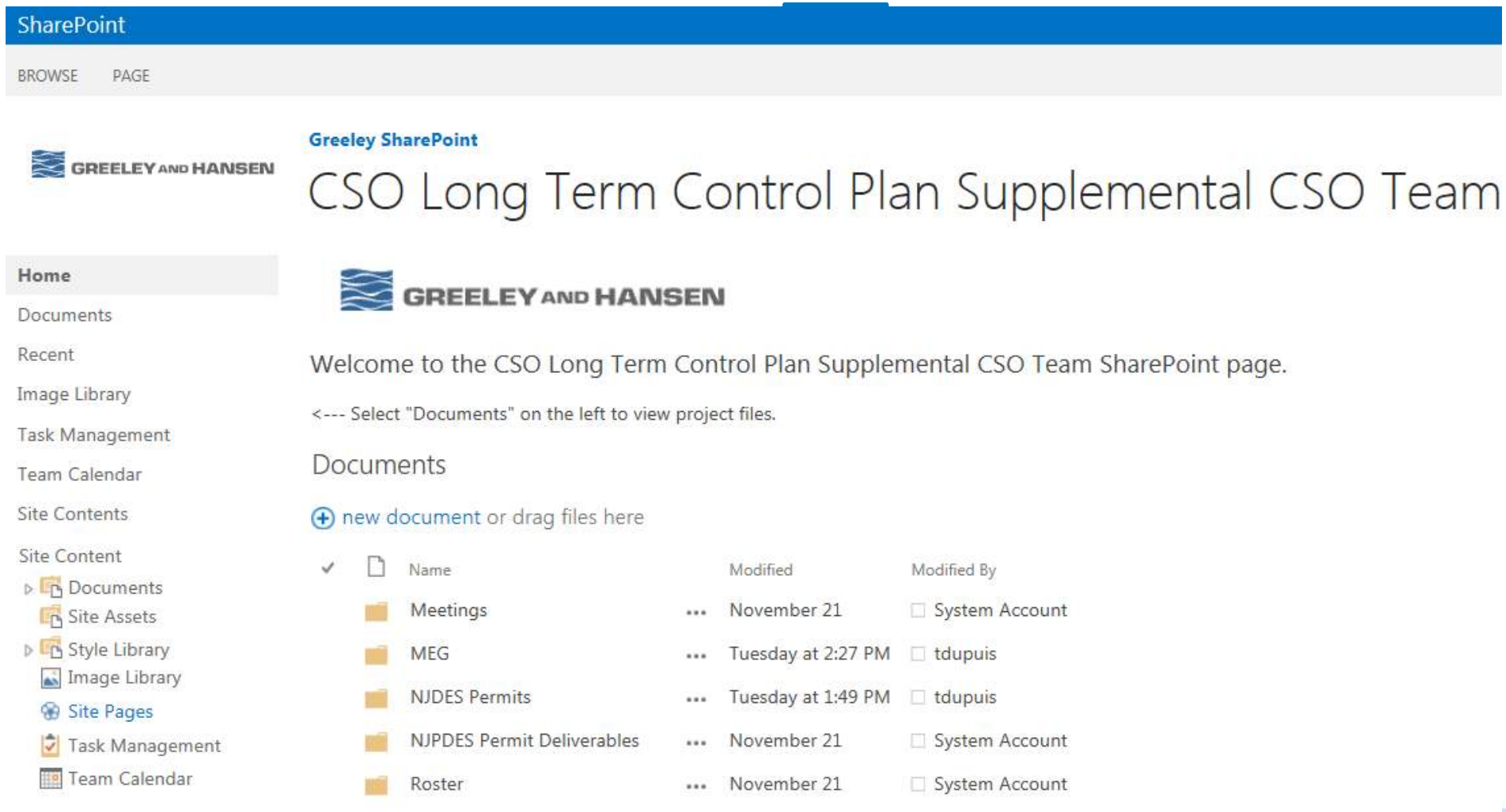
- Introduction and Recap
- Branding Update
- Project Schedule
- Green Infrastructure for CSO Control
- Supplemental CSO Team Member Presentations
  - Paterson SMART – Sandra Meola
- Other Issues
- Adjourn

Introduction and Recap

Supplemental CSO Team Members

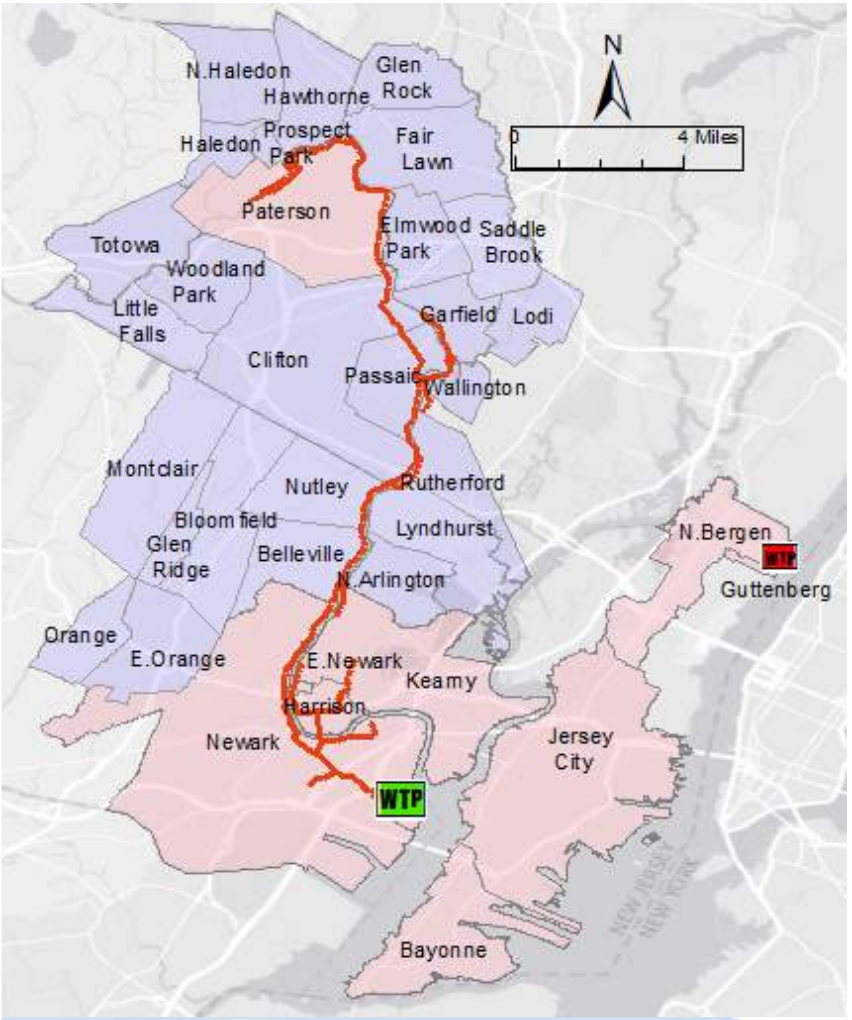
Member	Organization	Member	Organization
Matt Dorans	Bayonne Chamber of Commerce	Sandra Meola	Paterson Smart
Ben Costanza	Bayonne Chamber of Commerce	Ruben Gomez	City of Paterson Economic Development
David P. Donnelly	Jersey City Redevelopment Agency	Sheri Ferreira	Greater Paterson Chamber of Commerce
Nicole Miller	Newark DIG	Betty Jane Boros	New Jersey Business & Industrial Association
Molly Greenberg	Ironbound Community Corporation	Debbie Mans	NY/NJ Baykeeper
Robin Dougherty	Newark Greater Conservancy/Newark Business Partnership	Meiyin Wu, Ph.D	Montclair State University - Passaic River Institute
Jorge Santos	Newark Community Economic Development Corporation	Christopher C. Obropta, Ph.D	Rutgers University - Cooperative Extension Water Resources
Christopher Pianese	Township of North Bergen	Captain Bill Sheehan	Hackensack Riverkeeper
Janet Castro	Hudson Regional Health Commission Town of North Bergen	Harvey Morginstin	Passaic River Boat Club & Passaic River Superfund CAG
Thomas Stampe	North Bergen "Sustainable Jersey" group	Laurie Howard	Passaic River Coalition
Nancy Kontos	Bunker Hill Special Improvement District	Ben Delisle	Passaic River Rowing Association
Sara K. Schultzer,	Jersey City Environmental Commission		

Supplemental CSO Team SharePoint Site



Permittees

Permittee	Municipality	WWTP	CSOs
Bayonne MUA	Bayonne	PVSC	30
Borough of East Newark	East Newark		1
Town of Harrison	Harrison		7
Jersey City MUA	Jersey City		21
Town of Kearny	Kearny		5
City of Newark	Newark		18
North Bergen MUA	North Bergen		7
City of Paterson	Paterson		23
PVSC	-		0
Town of Guttenberg	Guttenberg	Woodcliff	1
North Bergen MUA*	North Bergen		1
	Total		114



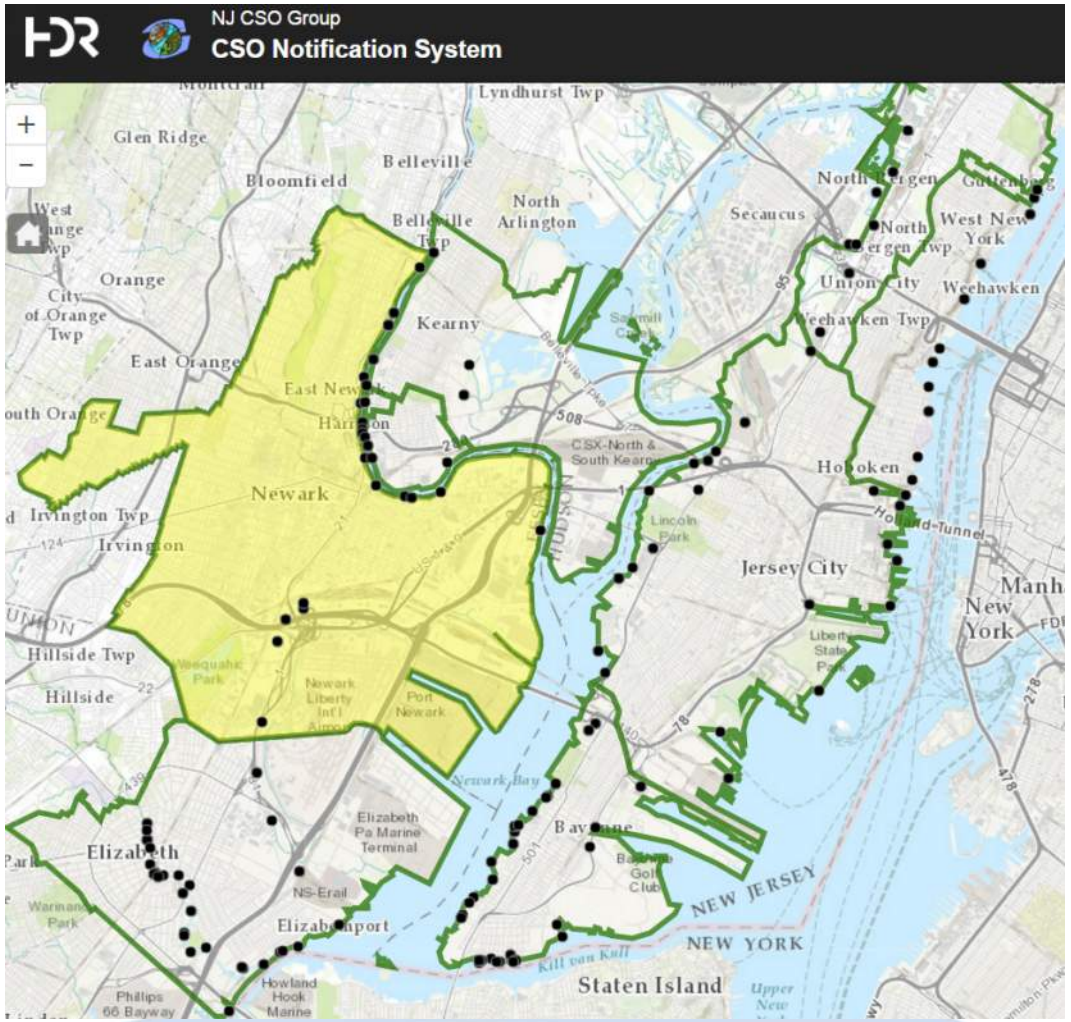
** North Bergen MUA conveys flows to both PVSC and Woodcliff WWTPs*

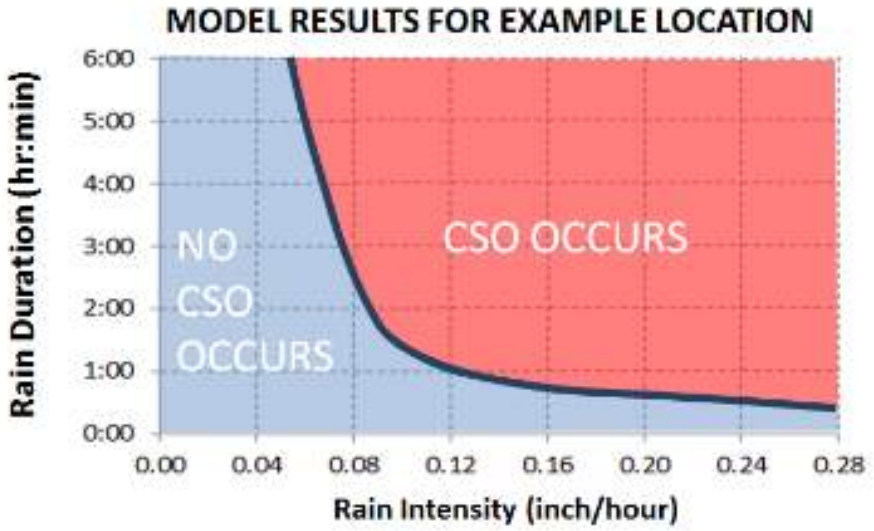
Overview of Progress To Date (Current Permit)

- Advisory/Warning Signs Posted Near Outfalls
- CSO Notification System *(http://njcso.hdrgateway.com)*
- CSO Monthly Discharge Monitoring Reporting (DMRs)
- Work Plans/QAPPs Submitted to NJDEP
  - Baseline Compliance Monitoring Program QAPP – Approved
  - System Characterization and Landside Modeling Program QAPP – Approved
  - Pathogen Water Quality Model QAPP - Approved
  - Other Existing System Characterization Documents - Approved
- Monthly Meetings Amongst the Permittees
- Evaluation of Previous Models and Further Model Development
- Completed Flow Monitoring Program
- Actively Updating Hydrologic and Hydraulic Collection System Models
- Actively Performing Water Quality Monitoring and Model Development

CSO Notification System

- Public notification system
- http://njcso.hdrgateway.com/
- A predictive system, not a monitoring system
- Utilizes model derived rating curves to predict overflow events at each outfall location





Branding of LTCP Program

Branding of the LTCP Program

- Selected based upon input from the Permittees and Supplemental CSO Team
- WATERWAYS used in consideration of the diverse types of waterbodies impacted by CSO discharges; rivers, streams, and bays
- Diversity of building types in the city skyline captures the variety of cities and neighborhoods impacted by the CSOs

CLEAN WATERWAYS
Healthy Neighborhoods

Detailed Project Schedule

Supplemental CSO Team Meeting Schedule

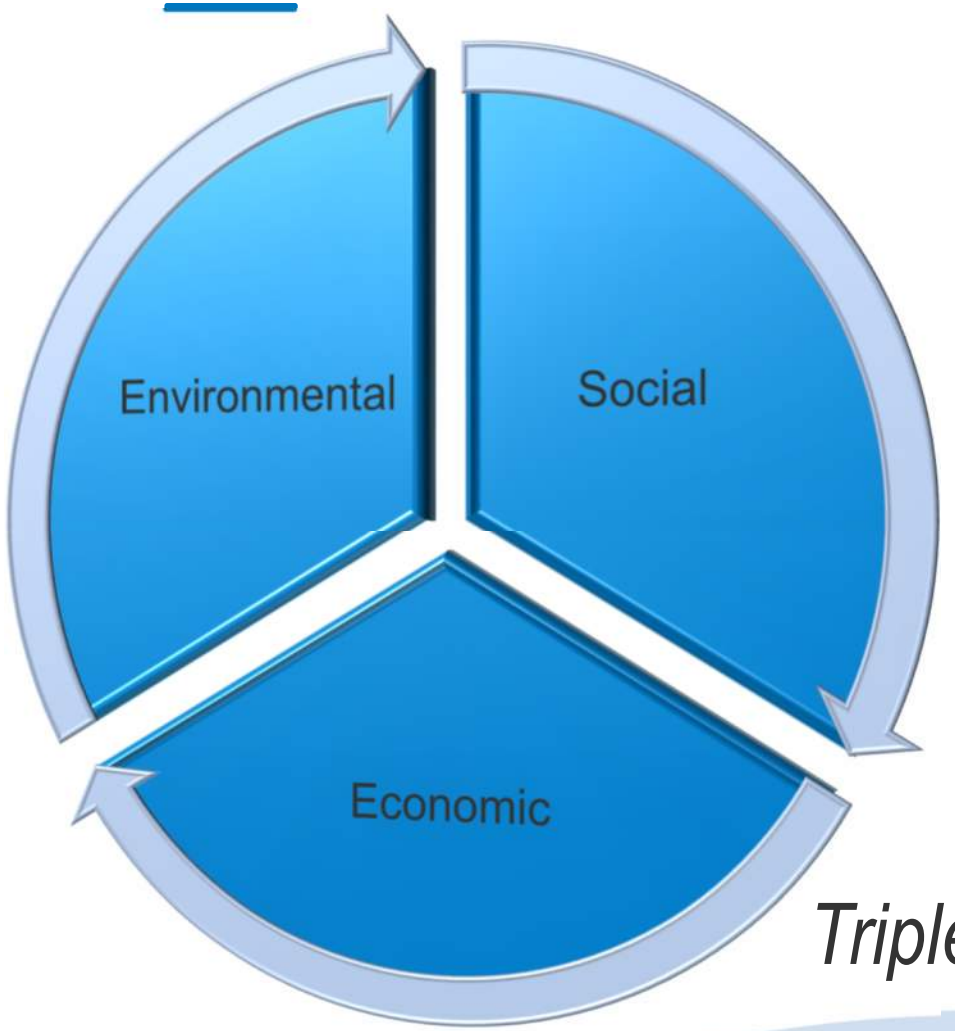
	2017									2018													2019													2020					
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June
Public Participation																																								
Municipal Evaluation of CSO Control Alternatives																																								
Regional Evaluation of CSO Control Alternatives																																								

Supplemental CSO Team Meeting Month
Anticipated On-Going Project Task

Green Infrastructure Practices for CSO Control

Purpose and Benefits of GI as a CSO Control Alternative

- Primary Purpose
  - Reduce Overflows
- Additional Benefits
  - Flood mitigation
  - Cooler temperatures
  - Improved air quality
  - Health improvements
  - Visible green legacy
  - Green jobs
  - Recreational amenities
  - Increased real-estate values



Triple Bottom Line

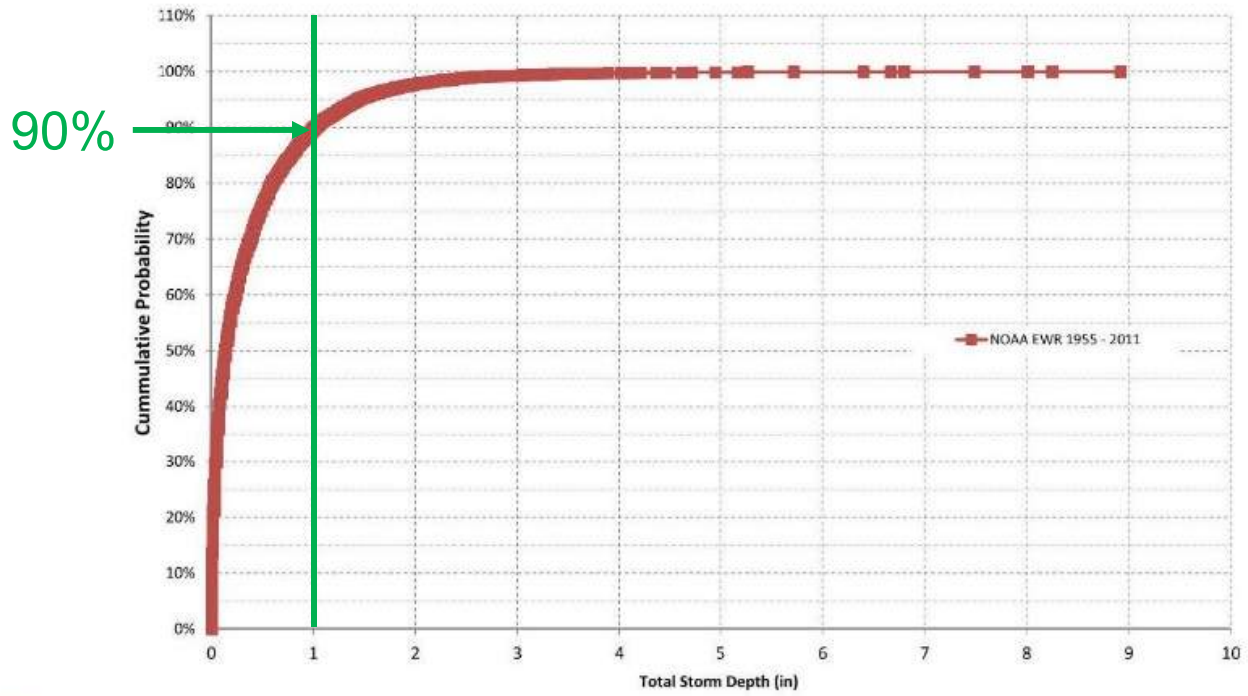
Green Infrastructure for CSO Reduction

- Reduce volume of runoff to Combined Sewers
  - Capture and infiltrate runoff before it enters the collection system
  - Restore the natural hydrologic cycle
  - Replenish groundwater aquifers
  - Less volume entering the collection system = less overflow

- Attenuate peak rate of runoff to Combined Sewers
  - Capture and store runoff
  - Slowly release stored volume to the collection system after conveyance and treatment capacities have recovered
  - Reduced peak flow = less overflow

Stormwater Capture Requirement

- 90 percent of storms are one inch or less
- Capture runoff from the first inch of rainfall



Three GI Initiatives

1. On Private Property
2. On Public Property
3. In the Right-of-Way

- Raingardens
- Bioswales
- Cisterns
- Rain Barrels
- Green Roofs
- Blue Roofs
- Turf Fields
- Pervious Pavement
- ROW Bioswales
- Tree Pits
- Pervious Pavement

Conventional GI practices already well covered in Rutgers and NJDEP manuals and website

Green Infrastructure on Private Property

Positives

- Totally or partially paid for by non-municipal sources
- Can be incorporated into redevelopment plans and requirements
- Many available opportunities for implementation

© Photo courtesy of Martina Frey

Buckman Heights Apartments, Portland, OR.

Negatives

- Less control by the municipalities
- Uncertain amount of GI to be implemented for the LTCP
- Many approvals and permits may be needed
  - zoning; planning; building; others
- May require municipal funding incentives

Green Infrastructure on Public Property

Positives

- A government agency already owns and controls the property
  - *School system, parks department, public housing authority, parking authority*
  - *Fewer permits or approvals may be required*
- Larger available spaces may allow for lower cost design options
- Potential to incorporate community amenities
  - Turf fields on playgrounds
  - Permeable basketball courts

Negatives

- Requires increased coordination between government agencies
- Limited number of sites

2,500 Gallon Cistern
Public School 5, Paterson
Rutgers Cooperative Extension Water Resources Program
PVSC

Green Infrastructure in the Right-of-Way

Positives

- Municipality already controls the property
- Streets are already designed to convey and collect runoff
- Right-of-Way area is a significant portion of the drainage area (NYC ~ 27%)
- Opportunities for standardization of designs
- Highly visible shared community assets
- Ability to group multiple GI projects into one Construction Contract or incorporate GI into other projects (sewer replacement, road improvements, etc.), which could lower construction costs.

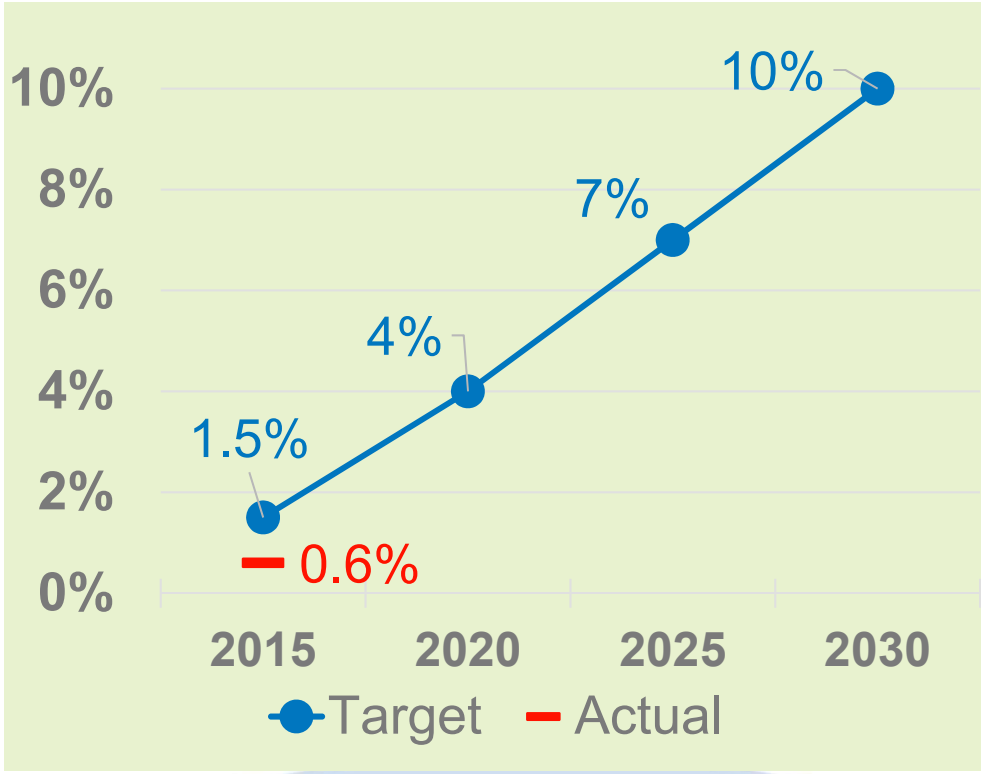
Negatives

- High cost
- Utility conflicts
- Parking impacts
- Maintenance

This slide is a video.

Case Study – NYC GI Program

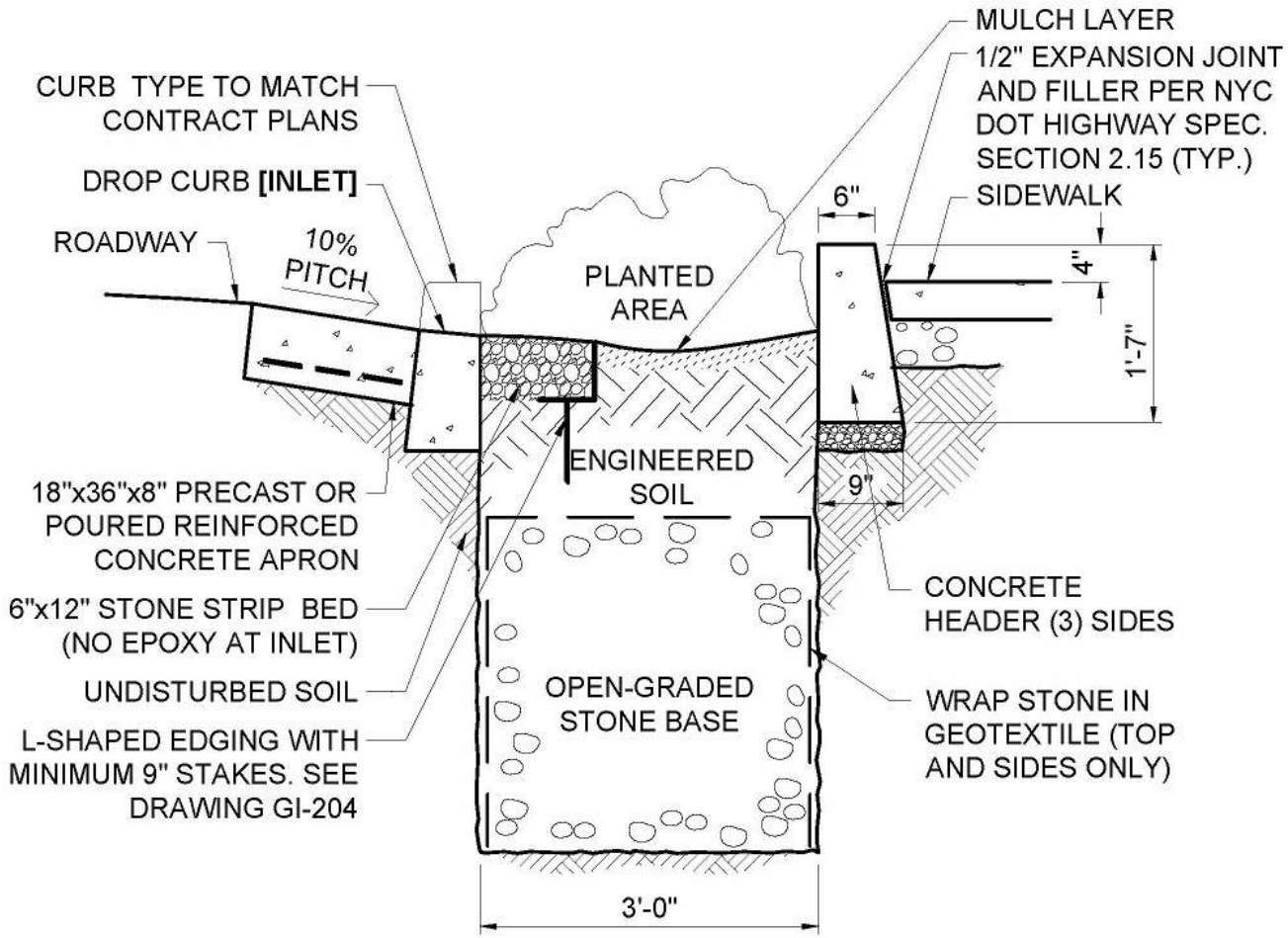
- NYC targets controlling the 1” storm from 10% of combined sewer area impervious surfaces by 2030
- Reduce CSO volume by an additional 2 billion gallons per year over the all-grey strategy
- Reduce the amount of grey infrastructure
  - Focus on cost effective grey and green
- Initial program primarily focused in the **Right-of-Way** (ROW)



NYC Right-of-Way Bioswales

- Constructing thousands of ROW Bioswales
  - Individual installations designed to store and infiltrate runoff from its tributary ROW area
  - Deeper than conventional rain gardens or bioswales
- Not well known in New Jersey
  - Not in NJDEP or Rutgers Manuals
  - Smaller sidewalk widths in NJ may make bioswales challenging (may need "green strips" instead)

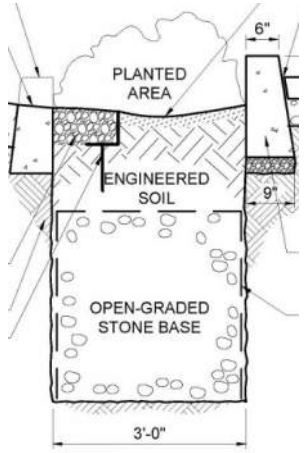
Cross Section of a NYC ROW Bioswale



Comparison of Storage Capacity

Simplified 4’ wide x 15’ ROW Bioswale

	Depth (ft)	Volume (cf)	Porosity	Storage (cf)
Engineered Soil	1.5	90	25%	22.5
Open-Graded Stone Base	3	180	50%	90
Surface	0.167	10	-	10
TOTAL STORAGE				122.5



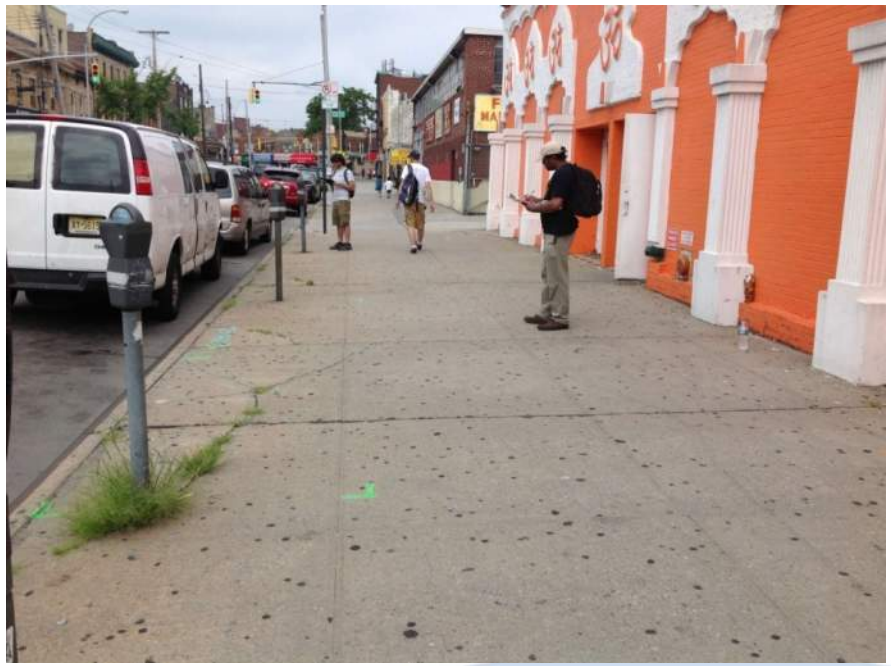
60 square foot Rain Garden in Sandy Soils

	Depth (ft)	Volume (cf)	Porosity	Storage (cf)
Surface	0.75	45	-	45
TOTAL STORAGE				45

See Rutgers Rain Garden Manual

ROW GI Site Selection Process

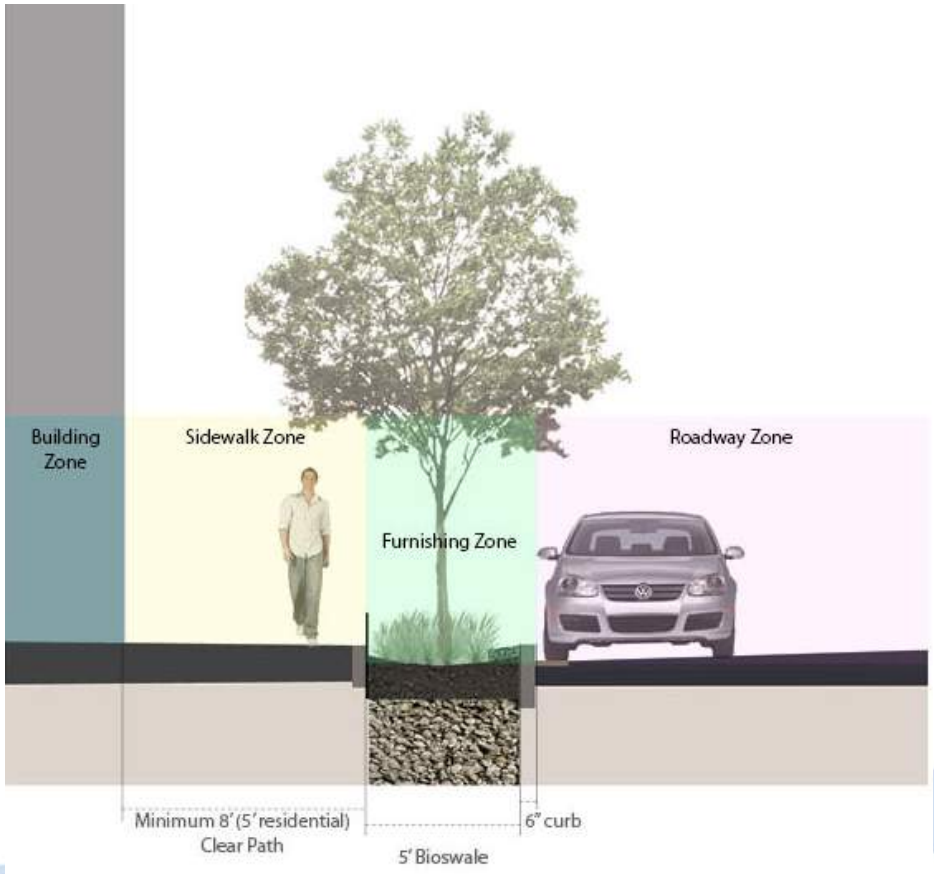
- Walk-Throughs to Investigate Potential Sites



ROW GI Siting Considerations

ROW Siting Criteria examples:

- Mature Trees
- Sidewalk widths (8’ or 5’)
- Fire Hydrants
- Pedestrian Ramps
- Building Entrances/Exits
- Driveways
- Parking Meters
- Bus Stops



ROW Site Selection Process

- Geotechnical investigations to determine site suitability for infiltration
  - Boring and Permeability Tests
  - Depth to groundwater and bedrock
- Subsurface Utility Investigation
  - Water/Sewer
  - Gas
  - Cable, Telephone, Fiber Optic
- NYC's ROW GI Program
  - 25% to 75% success rate depending on project area

ROW GI Construction

- Example from one NYC Construction Contract
  - 398 Right-of-Way Bioswales (ROWBs)
  - $11,700 per ROWB
  - Manage a total of 31 acres of impervious area
  - $150,000 per impervious acre treated

  - Additional Costs:
    - Siting
    - Engineering
    - Geotechnical Investigations
    - Survey
    - Administration
    - Maintenance

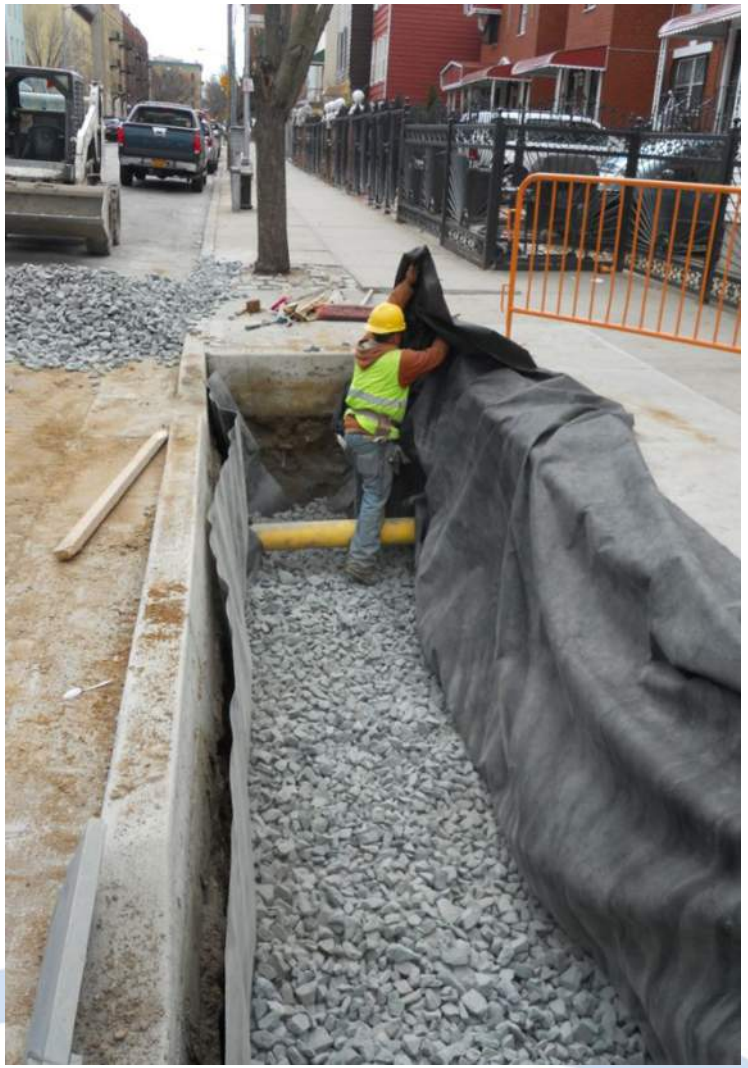
ROWB Construction

Excavation extents identified

Site being excavated

Excavation Complete

Crushed Stone Added



ROWB Construction

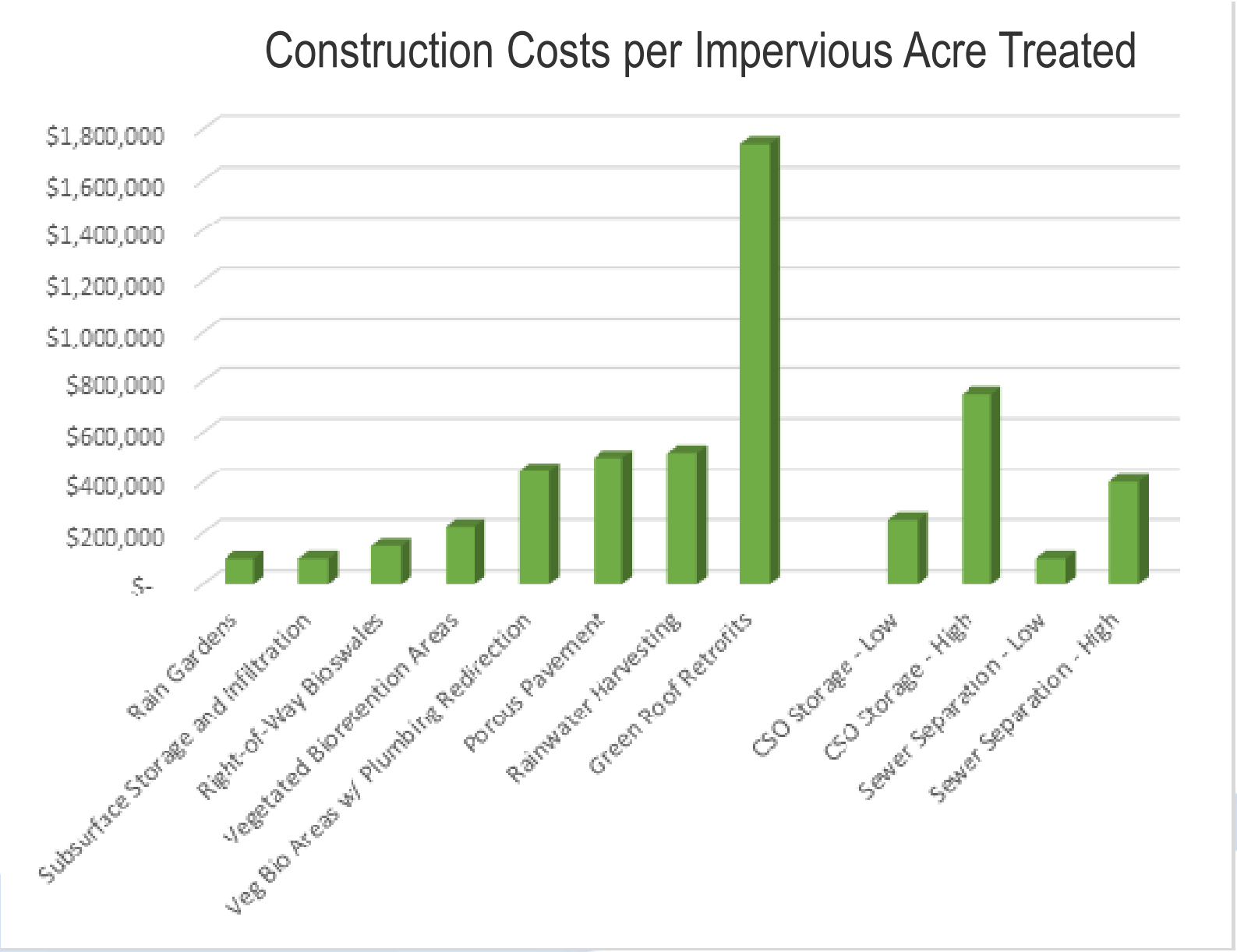
Engineer Soil Added

Plantings and Mulch Added

Stone Strip Complete, Tree Added

Established Plantings

Cost of GI Practices



Credits

- New York City Department of Environmental Protection
- Philadelphia Water Department
- Camden SMART
- Paterson SMART
- Rutgers Cooperative Extension

Supplemental CSO Team Member Presentations

Next Steps

Questions and Final Discussion