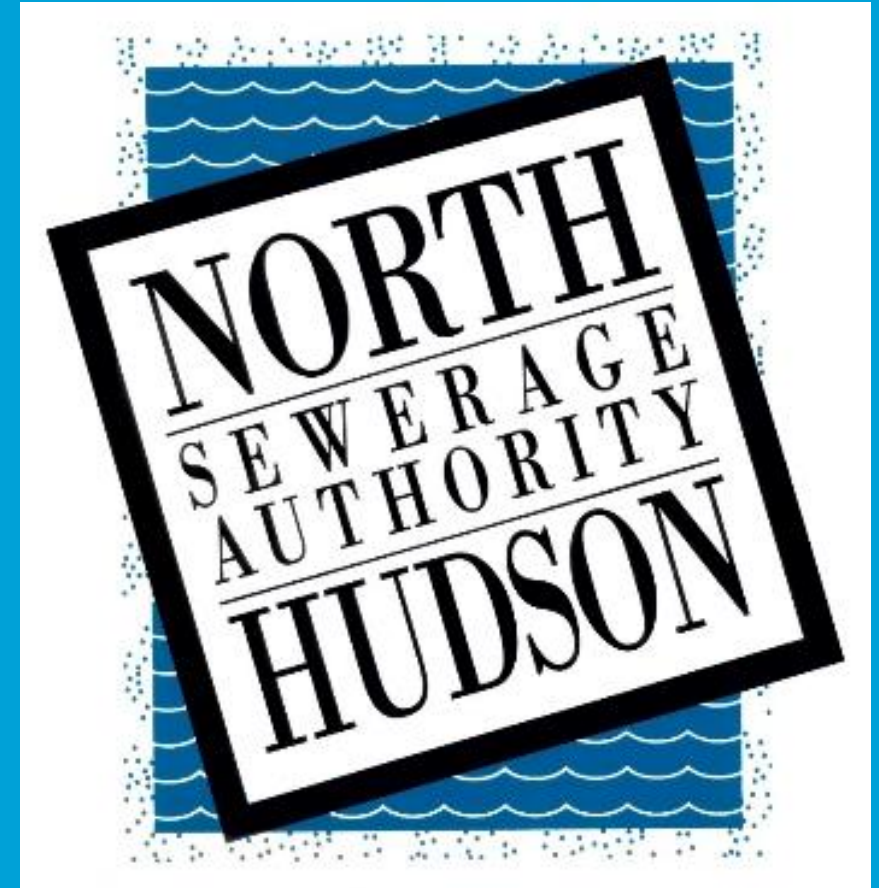


North Hudson Sewerage Authority CSO Long Term Control Plan

Public Meeting #1

1. Introduction to North Hudson Sewerage Authority
2. Combined Sewer Overflows Explained
3. North Hudson Combined Sewer System and Facilities
4. NJDEP Long Term Control Plan Requirements
5. Ongoing LTCP Project Activities
6. Next Steps

February 25, 2019



Introduction to the North Hudson Sewerage Authority

NHSA History - Establishment

- 1985 – Sewer Ban put into effect
- 1988 – Tri-City Sewerage Authority established



NHSA History - Establishment

- 1989 - The Authority privatizes operations, hires CH2M Hill OMI.



NHSA History - Enabling the Development of the Gold Coast

- 1993 – Adams Street WWTP is opened



NHSA History - Enabling the Development of the Gold Coast

- 1994 – Sewer Ban is lifted



State of New Jersey
Department of Environmental Protection and Energy
Environmental Regulation
CN 401
Trenton, NJ 08625-0401

Jeanne M. Fox
Acting Commissioner

January 13, 1994

John R. Weingart
Assistant Commissioner

Richard J. Wolff, Chairman
Hoboken-Union City-Weehawken Sewerage Authority
1600 Adams Street
Hoboken, New Jersey 07030

Re: Sewer Connection Ban Rescission
HUCWSA Sewage Treatment Plant Service Area

Dear Mr. Wolff:

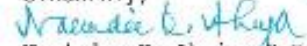
I am writing in reference to two letters, dated November 19, 1993, and January 7, 1994, both from Fredric J. Pucci, P.E., HUCWSA Engineer, requesting the rescission of the existing sewer connection ban imposed upon the sewer service area of the HUCWSA Sewage Treatment Plant (STP). This ban was imposed on August 12, 1985 due to inadequate treatment capability at said treatment facility.

The Department of Environmental Protection and Energy had issued a Treatment Works Approval permit (89-2220-4), dated July 28, 1989, for the upgrade of the HUCWSA STP. Construction of the STP upgrade was completed and the Department has received an executed WQM-308 Certification for Approval form. Included with the January 7, 1994 letter from Mr. Pucci was a letter from Patrick J. Lawler, P.E., of Lawler, Marusky and Skelly Engineers, the design engineers for the STP upgrade, which certifies that the upgraded HUCWSA STP is designed to meet and is capable of meeting all the final effluent limitations and terms of its NJPDES permit No. NJ0026005.

Therefore, based on the above, the sewer connection ban imposed on the HUCWSA STP is hereby vacated as of the date of this letter. It needs to be noted, however, that if at any time in the future a sewer connection ban is required, as per N.J.A.C. 7:14A-12.21 et seq., it must be immediately imposed.

If you have any additional questions concerning this matter, please contact Nicholas Horvath, Principal Environmental Specialist, Bureau of Construction and Connection Permits, at (609) 984-4429.

Sincerely,


Narinder K. Ahuja, P.E., P.E.
Assistant Director
Division of Water Quality

WFR317

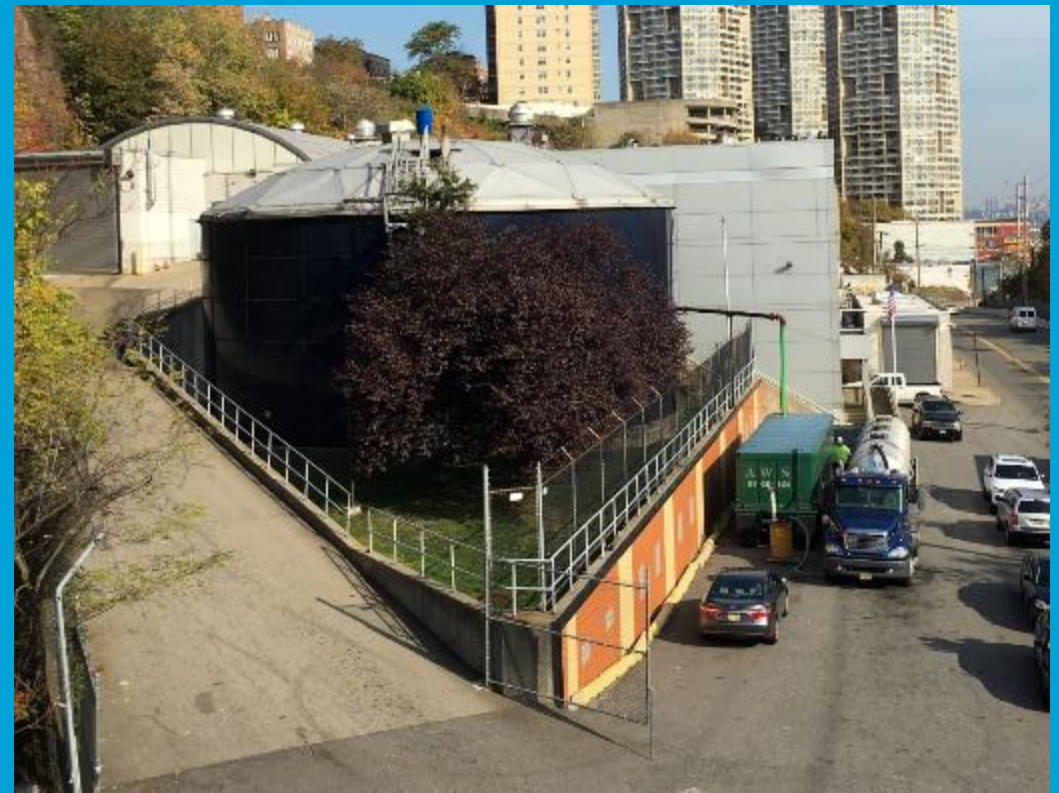
cc: Fredric J. Pucci, P.E., HUCWSA
City of Hoboken
City of Union City
Township of Weehawken
Bureau of Watershed Permitting
Metro Bureau of Water and Hazardous Waste Enforcement
Mike Mugnacki, BCCP

JAN 18 1994

New Jersey is an Equal Opportunity Employer
Recycled Paper

NHSA History - Establishment

- 1996 - The Authority acquired the West New York Municipal Authority. The North Hudson Sewerage Authority is formed.



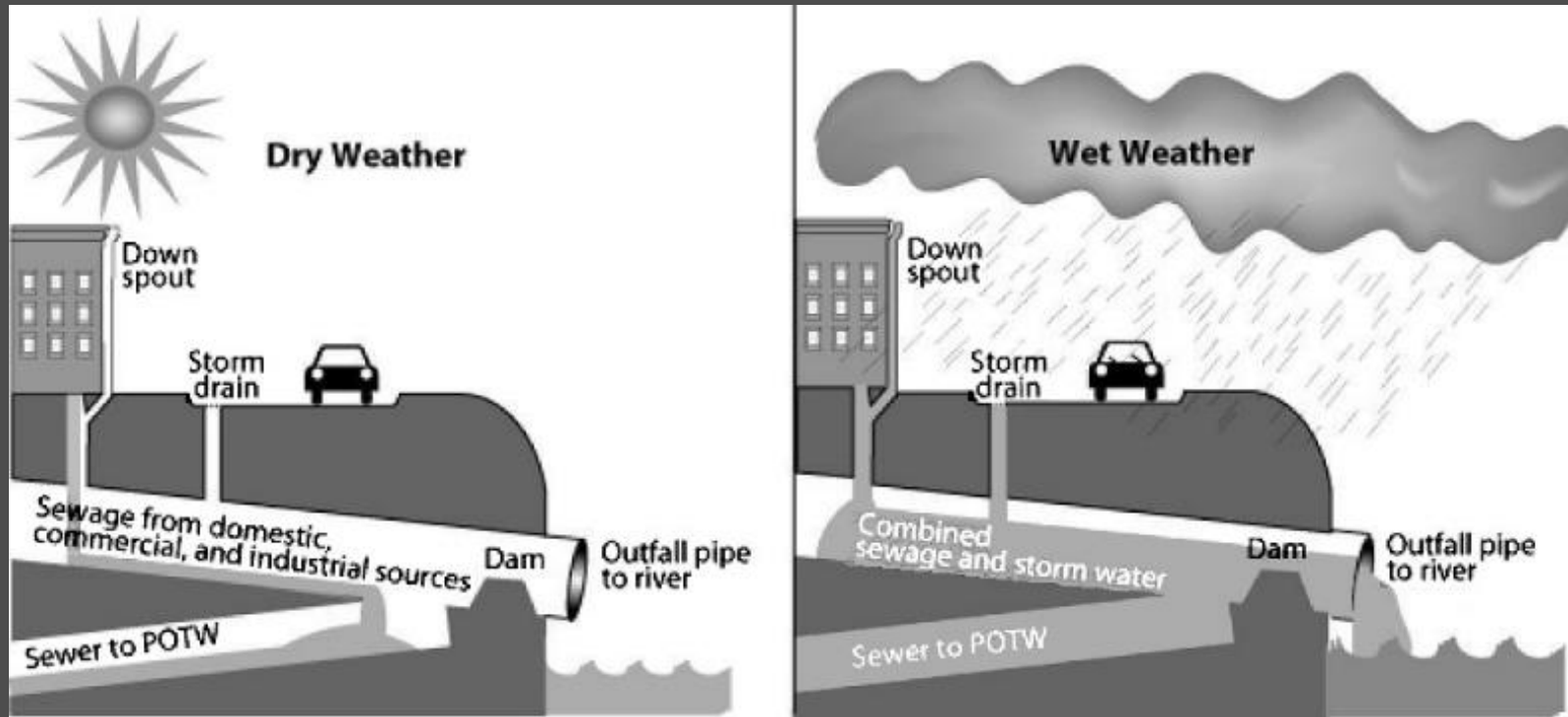
Combined Sewer Overflows Explained

Combined Sewer Systems

- Not all systems combine sanitary flow and stormwater in the same sewer pipe.
- A combined sewer system is normal in older urban areas, like Hudson County, where sewer infrastructure can date from the Civil War.
- In newer communities, there are separate sewer pipes for sanitary and storm flow.
- During dry weather, combined sewer systems work just fine. The problem is when it rains.



Combined Sewer System and CSOs



A combined sewer system (CSS) collects rainwater runoff, domestic sewage, and industrial wastewater into one pipe. Under normal conditions, it transports all of the wastewater it collects to a sewage treatment plant for treatment, then discharges to a water body. The volume of wastewater can sometimes exceed the capacity of the CSS or treatment plant (e.g., during heavy rainfall events or snowmelt). When this occurs, untreated stormwater and wastewater, discharges directly to nearby streams, rivers, and other waterbodies.

So, why reduce CSO discharges?

To continue the rehabilitation of the Hudson River until it is virtually swimmable again!

What's it Going to Take?

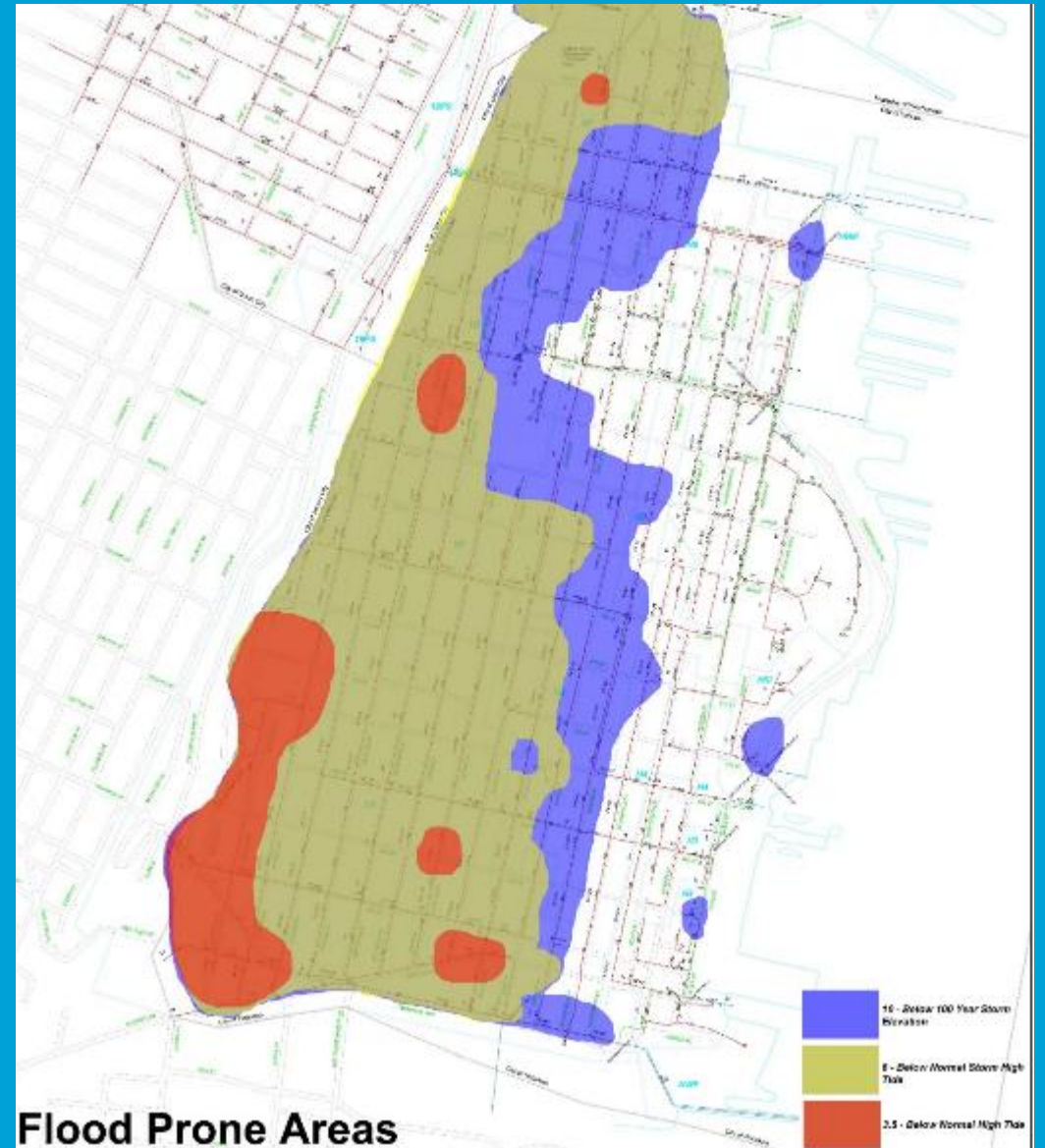
- Controlling CSOs requires significant investment in infrastructure, some of which is over 100 years old.
- North Hudson has stayed ahead of the curve by making substantial capital investments in infrastructure and maintenance for the last 25 years.
- Relative to other sewer systems around the State, North Hudson is in a strong position to successfully develop and implement its LTCP.
- To do so takes not only engineering expertise, but also considerable capital.
- The infrastructure costs will be spread over decades which will minimize the impact on current customers.

What have we done so far?

- The work to reduce CSOs goes back many years, before the current 2015 Federal and State mandate.
- Over the last 20 years, North Hudson has eliminated three CSOs that discharge into the Hudson River.
- Over 5.5 miles of sewers have been relined, replaced and rehabilitated to increase capacity and flow to the treatment plants during rain events.
- Treatment systems have been upgraded.
- End-of-pipe controls have been put into place to provide basic treatment at the outfalls.
- Green infrastructure projects have been undertaken throughout the entire service area.
- Detention tanks have been built under public parks.
- Wet weather pump stations have been constructed to prevent flooding.

NHSA History - Combating Flooding in Hoboken

- Hoboken has faced flooding throughout its history.
- Several areas in the city are located below storm tides.
- H-1 Wet Weather Pump Station Commissioned October 17, 2011, and has reduced street flooding in Southern Hoboken.



NHSA History - Combating Flooding in Hoboken

- H-5 Wet Weather Pump Station on 11th Street.
- Construction completed October 2016.
- This pump station has reduced flooding in the northwest section of Hoboken.



9th and Madison Before & After Pump Station Constructed

North Combined Sewer System and Facilities

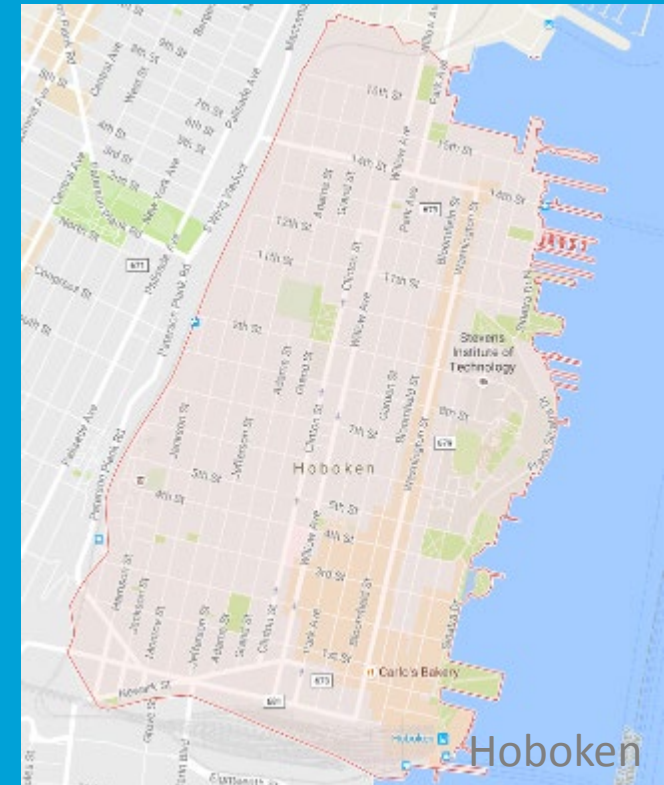
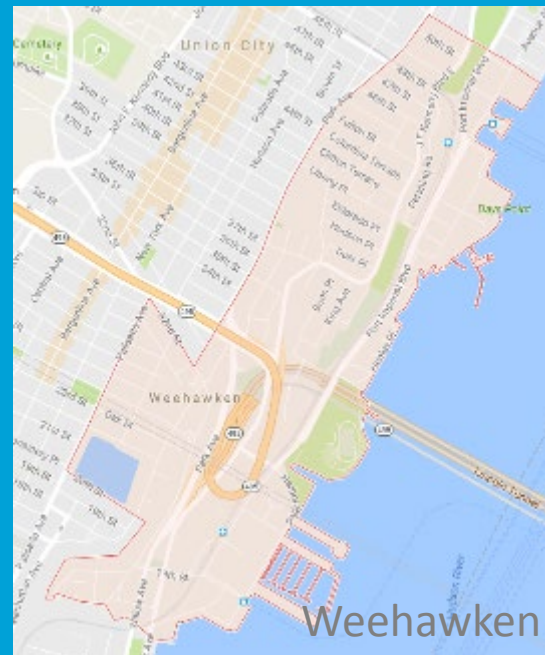
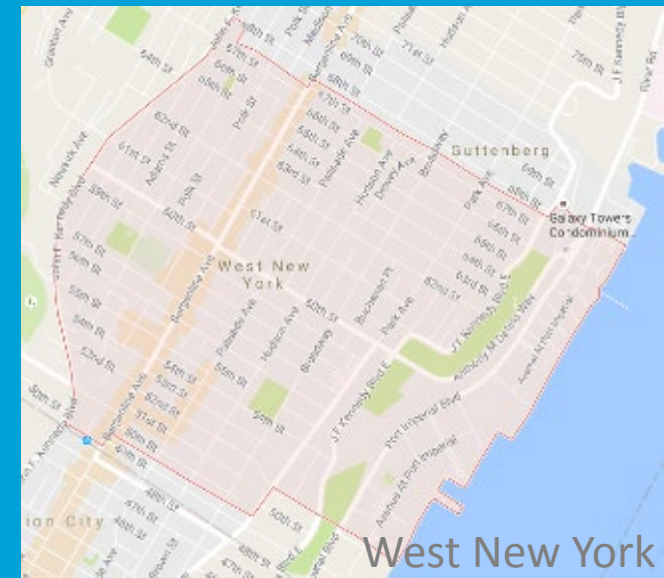
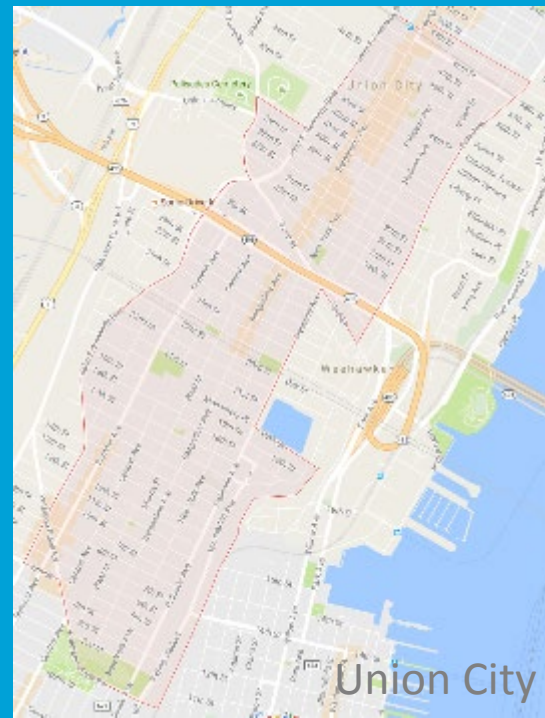
North Hudson System

- Services

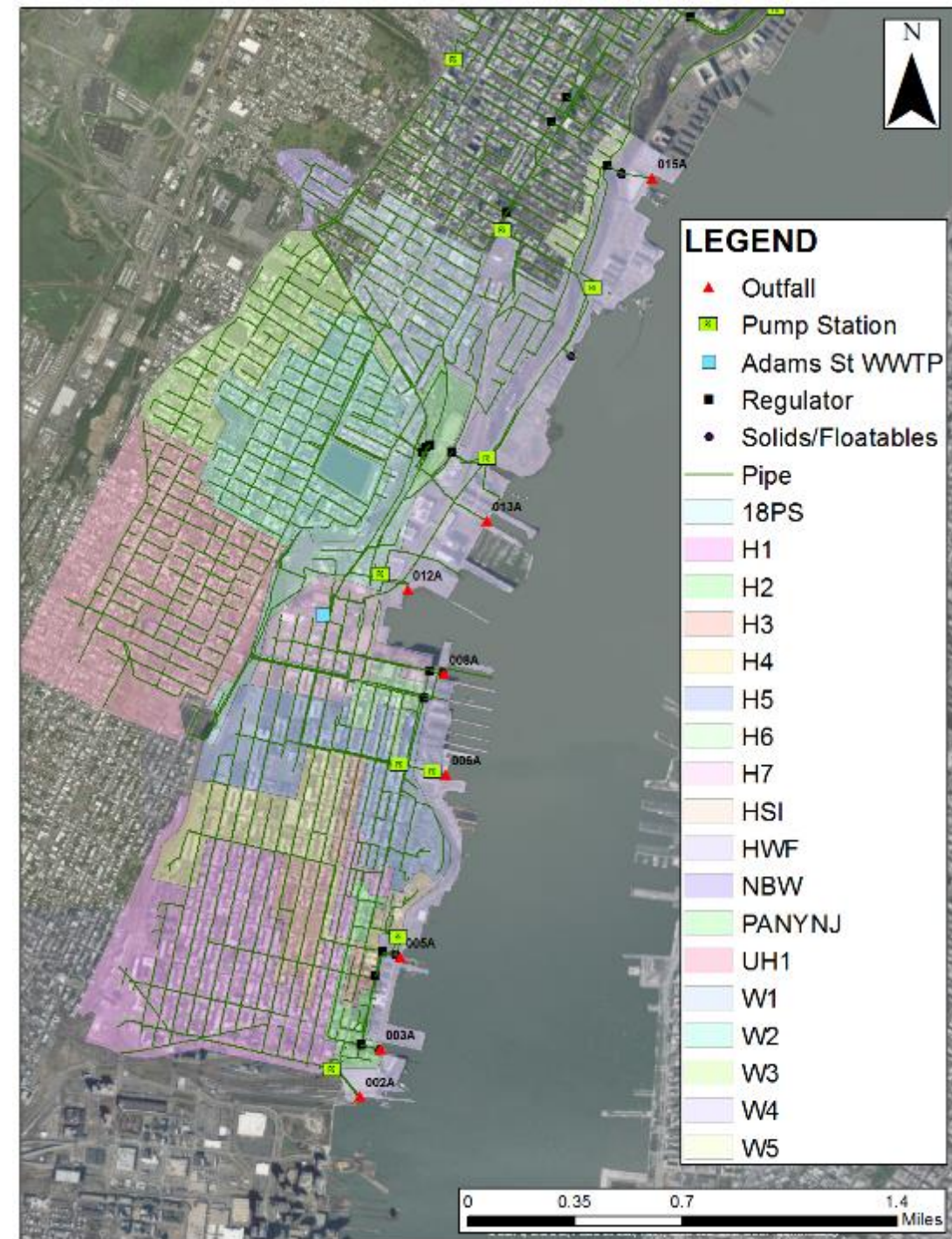
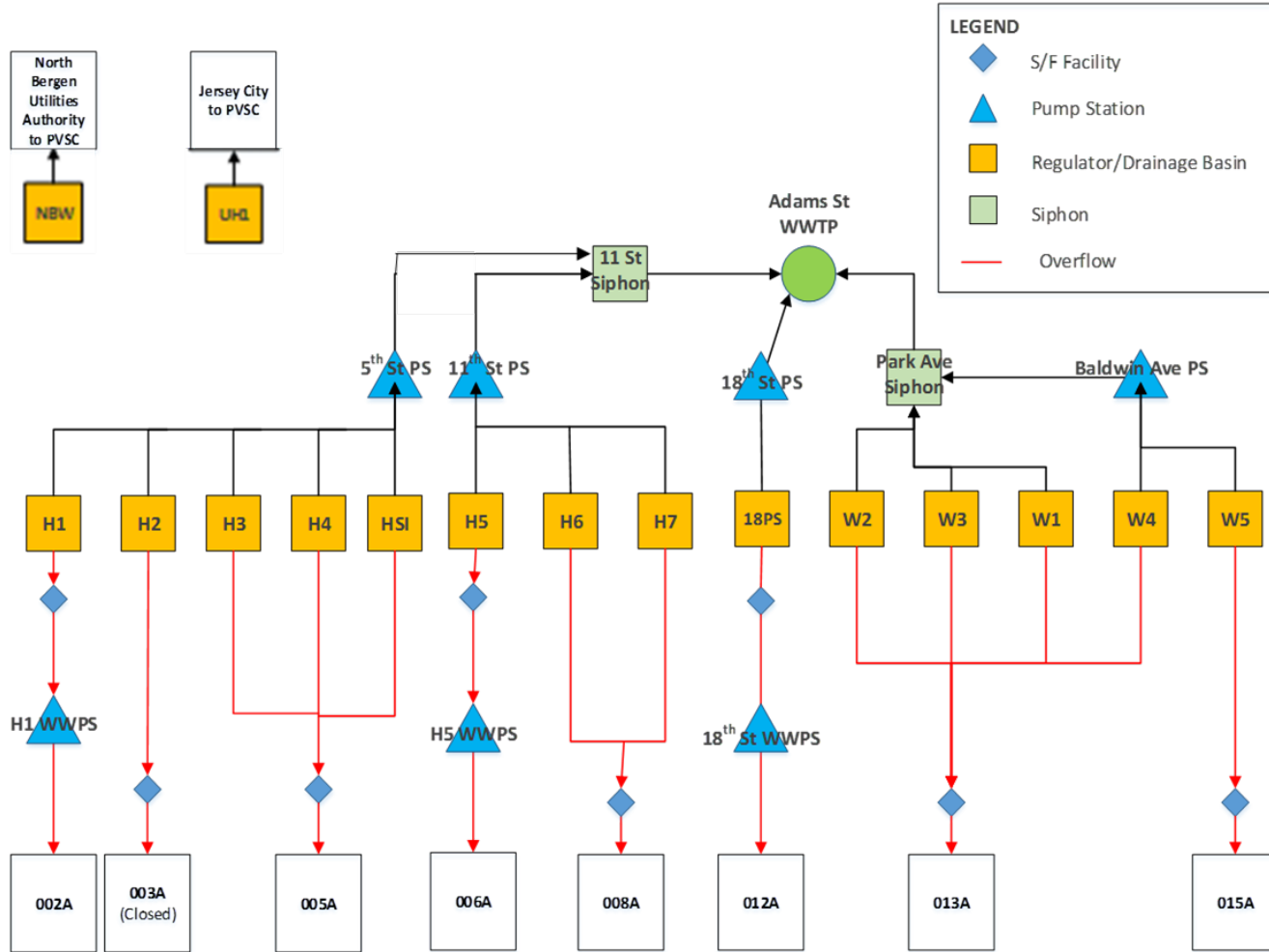
- Hoboken
- Weehawken
- West New York
- Union City

- NHSA Infrastructure Includes:

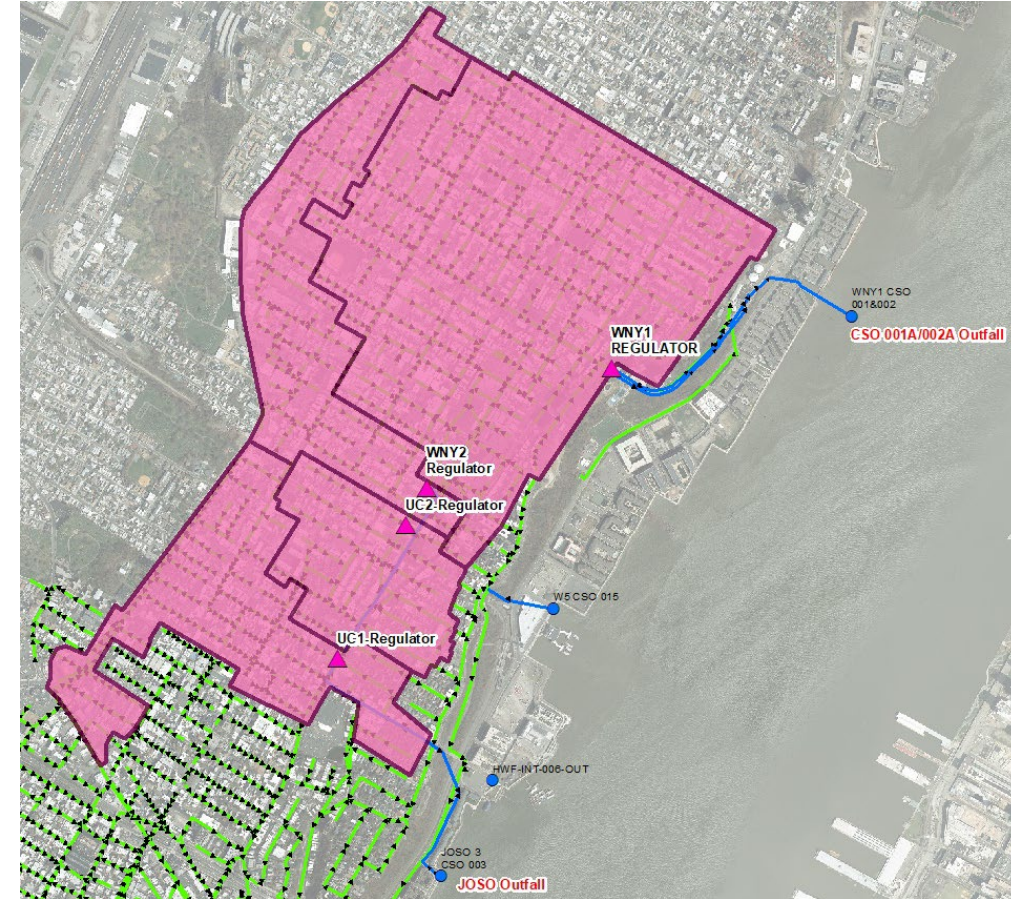
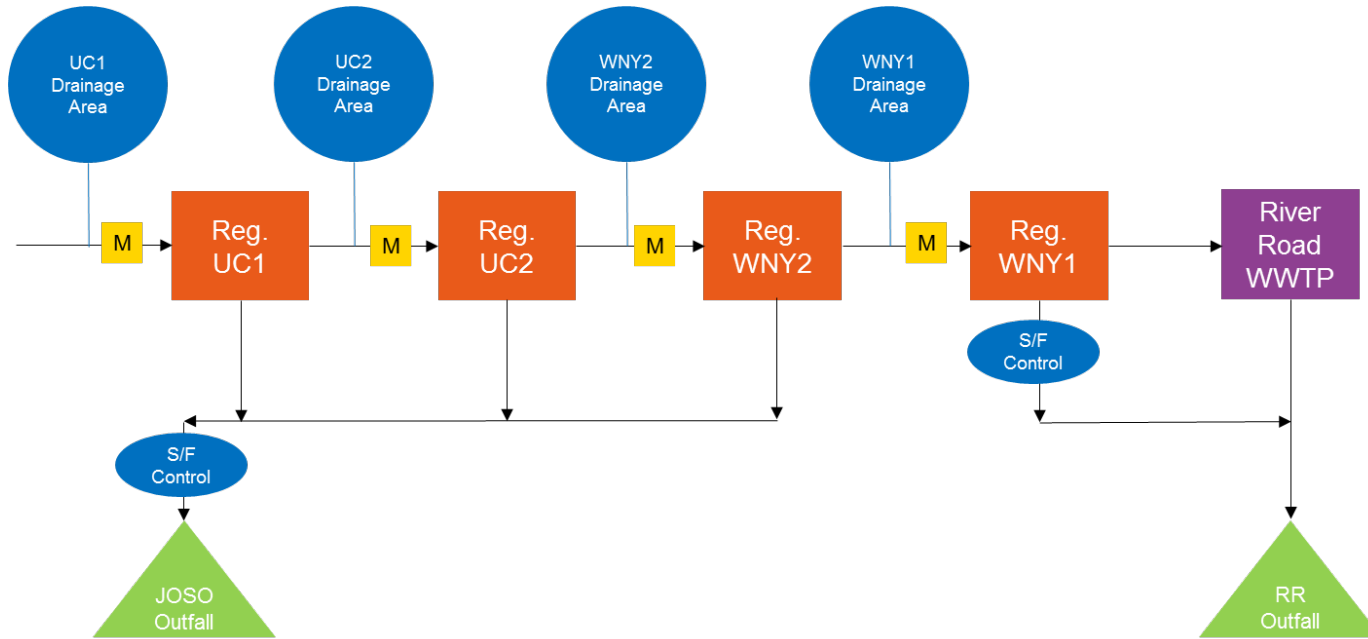
- 107 miles of combined sewers
- 10 Pump Stations
- 16 Combined Sewer Overflow (CSO) Regulators
- 10 CSO Outfalls with solids/floatables treatment
- 2 Wastewater Treatment Plants (WWTP)



Adams Street Combined Sewer System



River Road Combined Sewer System



Wastewater Treatment Plants



Adams Street Wastewater Treatment Plant
1600 Adams Street, Hoboken
20 million gallons per day (MGD)



River Road Wastewater Treatment Plant
6400 Anthony M Defino Way, West New York
10 MGD

NHSA Today

- NHSA is one of the largest wastewater entities in the State, serving a population of over 190,000
- Pride in Maintenance
- Since 2006, NHSA has spent over \$112 Million on Capital Improvement Projects.
- Current ongoing Capital Improvement Projects Include:
 - Adams Street WWTP Improvements
 - W1234 Solids/Floatables Facility at Lincoln Harbor
 - H6/H7 CSO LTCP Project in northwest Hoboken
 - Sewer lining and wood sewer removal



2006 – 2015 Capital Investments

Adams Street WWTP	\$26,510,776
River Road WWTP	\$11,611,278
Pumping Stations	\$32,550,174
Hoboken Sewer System	\$13,971,563
Union City Sewer System	\$7,556,027
Weehawken Sewer System	\$4,230,980
West New York Sewer System	\$15,684,515
TOTAL	\$112,115,313

NJDEP Long Term Control Plan Requirements

New Jersey Pollution Discharge Elimination System (NJPDDES) Permits have 2 Major Requirements for Wastewater Treatment Plants with CSOs

- **Nine Minimum Controls**

Nine (9) “low” cost measures to improve flows getting to the treatment plant, improve public notification, and update Operation and Maintenance procedures

- **Long Term Control Plans (LTCP)**

A complex engineering, hydraulic analysis of wastewater collection systems, pumping stations, combined sewer overflows, regulators and sewage treatment facilities, to provide the most cost effective manner to regulate CSO's so that the CSO National Policy can be met.

Develop a plan over 5 years to determine what system improvement projects will be needed over the next several decades to reduce the frequency, volume and impacts of CSOs.

NJPDES Nine Minimum Controls Permit Requirements Met via a Series of Activities and Submittals to the NJDEP by July 1, 2016:

- ✓ Update Operation & Maintenance Manuals, Emergency Plans, CSO Standard Operating Procedures, and Asset Management Plans
- ✓ Submit Discharge Monitoring Reports (DMR) for monthly solids/floatables, precipitation, and duration of CSO discharges
- ✓ System Characterization including GPS location of all pump stations, regulators and outfalls
- ✓ Review all Rules/Ordinances/Sewer Use Agreements to require infiltration/inflow (I/I) removal, submit schedule for revisions
- ✓ Delineate all combined sewer and separate sewer areas in the system
- ✓ Install new public information signs at all outfalls with a NJDEP hotline number to call.
- ✓ Create telephone hot line or website to inform public of when CSOs are discharging

NJPDES LTCP Permit Requirements Met via a Series of Activities and Submittals to the NJDEP by June 1, 2020:

- System Characterization (Work Plans and Reports) – July 1, 2018 ✓
- Baseline Compliance Monitoring (Work Plans and Reports) – July 1, 2018 ✓
- Public Participation Process (Report) – July 1, 2018 ✓
- Identification and Consideration of Sensitive Areas (Report) – July 1, 2018 ✓
- Develop and Evaluate CSO Control Alternatives (Report) – July 1, 2019
- Select Alternatives and Plan Implementation of the LTCP (Report) – June 1, 2020

Performed as a LTCP Program with a Consultant Program Manager and a series of projects performed by the Authority's Engineering Consultants

Ongoing LTCP Project Activities

Where Are We on Developing the LTCP?

Characterization

- Work Plans
- Field Work
 - Condition Assessment
 - Sewer Flow Monitoring
 - CSO Water Quality (WQ) Monitoring
 - Hudson River WQ Monitoring
- Identify Sensitive Areas
- Engineering
 - Land Use and Drainage Analyses
 - Hydraulic Sewer Modeling
 - Hudson River WQ Modeling
- Public Participation
- Reports

Engineering Alternative Evaluation

- Establish CSO Reduction Targets
- Identify Opportunities with Communities to Reduce CSOs
- Identify and Evaluate CSO Control Strategies and Technologies
- Estimate Potential Project Costs
- Assess Cost/Performance for Potential Projects
- Assess Financial Capability
- Identify Funding Mechanisms
- Report

Long Term Control Planning

- Select Strategies and Controls
- Select Funding Mechanisms
- Develop Schedule for Implementation
- Finalize LTCP
- Report

CSO Tasks

What have we done so far in operations?

1. Outfall Signs are installed.
2. Operations and Maintenance Manual, SOPs, Asset Management Plan, and Emergency Plan are all in place and are continuously being updated.
3. Update of the system infrastructure characterization is in progress.
4. GIS Map is complete.
5. Telephone Hotline has been online since 2012.
6. Website is in the process of being updated.
7. Updated Discharge Monitoring Reports are being submitted Monthly.



NHSA CSO Waterbody Advisory System

- Real-time status of CSO activity on the NHSA website.
- Inform the public of CSO activities.
- Uses level sensors and a cellular communication system.
- Live and online NOW!
- Visit: www.nhudsonsa.com



NJDEP required the Authority to form a “Supplemental CSO Team” to:

- Meet periodically to assist in the sharing of information, and to provide input to the planning process;
- Review the proposed nature and extent of data and information to be collected during LTCP development;
- Provide input for consideration in the evaluation of CSO control alternatives; and
- Provide input for consideration in the selection of those CSO controls that will cost effectively meet the Clean Water Act requirements.

North Hudson formed its “CSO Community Advisory Board”

Convening the North Hudson CSO Community Advisory Board

- The Authority:
 - solicited recommendations from the mayors of the four municipalities,
 - reached out to community organizations and environmental organization representatives, and
 - sought developers and other business community representatives via the chambers of commerce in the municipalities for members of the Board.
- The CSO Community Advisory Board includes members from and representing Hoboken, West New York, Weehawken, and Union City.
- Board members are a diverse group representing all aspects of life in the community it serves.
- Board members represent the business community, environmental groups, and community citizen action groups.

North Hudson CSO Community Advisory Board Members

- Brian Battaglia - Battaglia's Home and Hoboken Chamber of Commerce, Hoboken resident
- Larry Bijou - Bijou Properties (Hoboken business), Weehawken resident
- Jason Capizzi - Port Imperial Homeowners Association, West New York resident
- Carter Craft - Hoboken Cove Community Boathouse Board, Rebulid-by-Design Hudson River Citizens' Advisory Group (RBBD), Hoboken resident
- Mary Kelly - Hoboken Quality of Life/Nature Conservatory Committees, Hoboken resident
- Frank Raia - Raia & Sirignano LLC, Long time member of HOPES, former NHSA Commissioner, Hoboken resident
- Robert Sosa - Weehawken Parking Authority, Weehawken Resident
- Anthony Squire - Union City resident
- Debra Tantleff - New Jersey Committee of the Regional Plan Association and the Board of Directors for Downtown New Jersey, New Jersey Future and New Jersey Mixed-Use, Developers, West New York resident

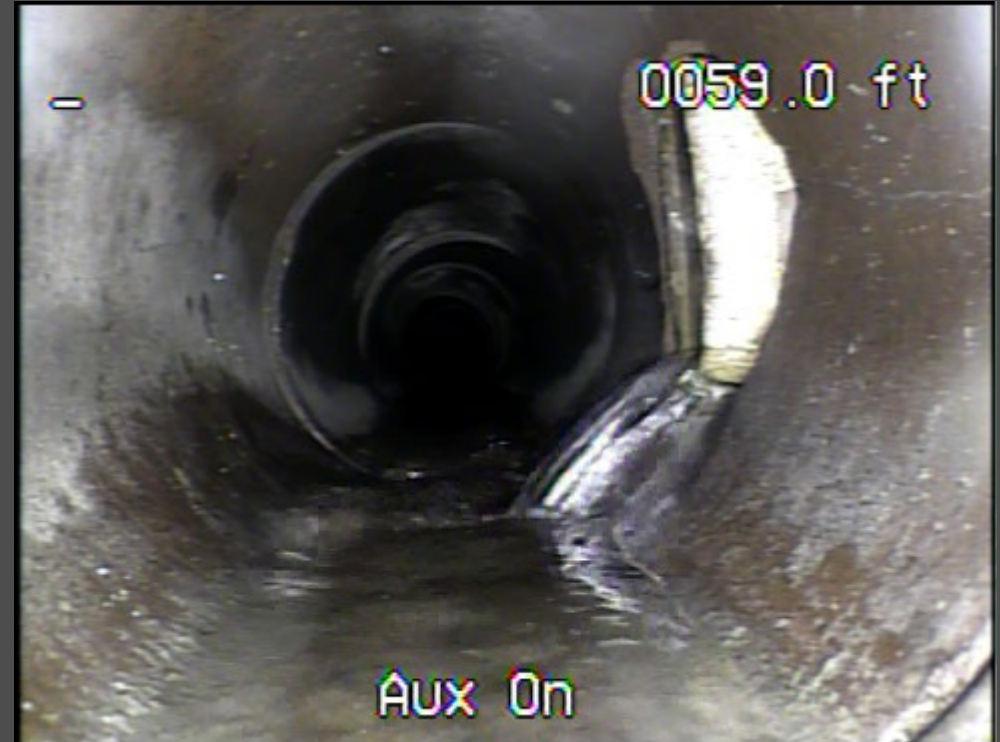
CSO Tasks

What have we done so far in planning?

- System Characterization Work Plan and Report
 - A work plan described how NHSA would assess the condition and performance of its combined sewer systems.
 - Work efforts included surveying, CCTV sewer inspection, sewer flow monitoring and modeling, and CSO discharge water quality monitoring.
 - Updated the Authorities information on combined sewer system characteristics and performance. The plan is essential to properly evaluate mitigation alternatives. A final report of the findings will be presented at the end of the project.
- Public Participation Process Plan and Report
 - A plan to assure that representatives of the public are aware of the CSO issues and have input into the CSO reduction projects.

Sewer Video Inspection and Condition Assessment

- CCTV camera inspection of pipes in the sewer system.
- Condition assessments are performed based on the videos.
- We rate and rank the sections of sewer for repair or replacement.
- We identify where water is entering the pipes through cracks due to trees roots, illegal connections, street pipe failures and leaks from water main leaks and breaks.
- The more groundwater and water main leaks removed from the system, the more space the system has for stormwater, and this will reduce CSOs.

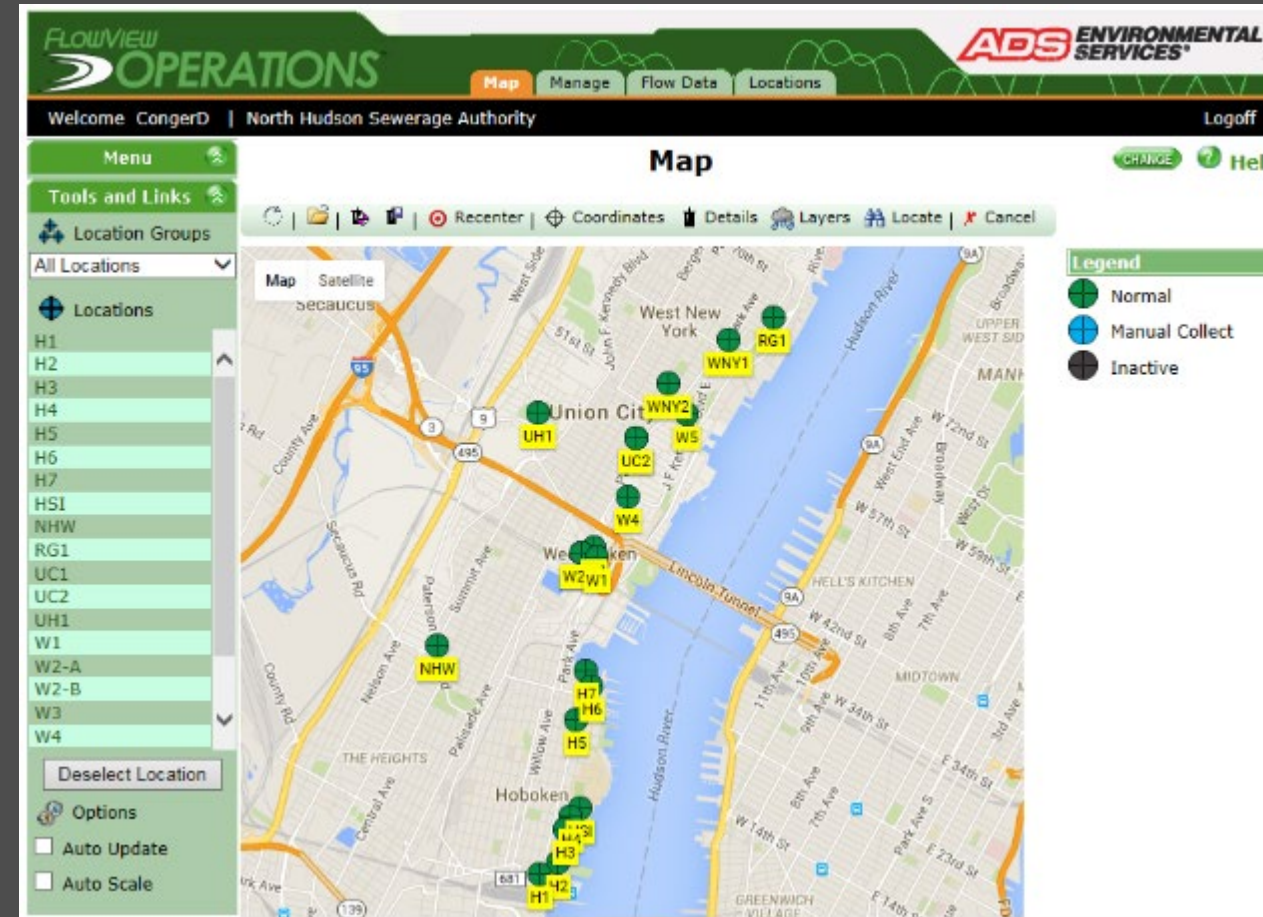
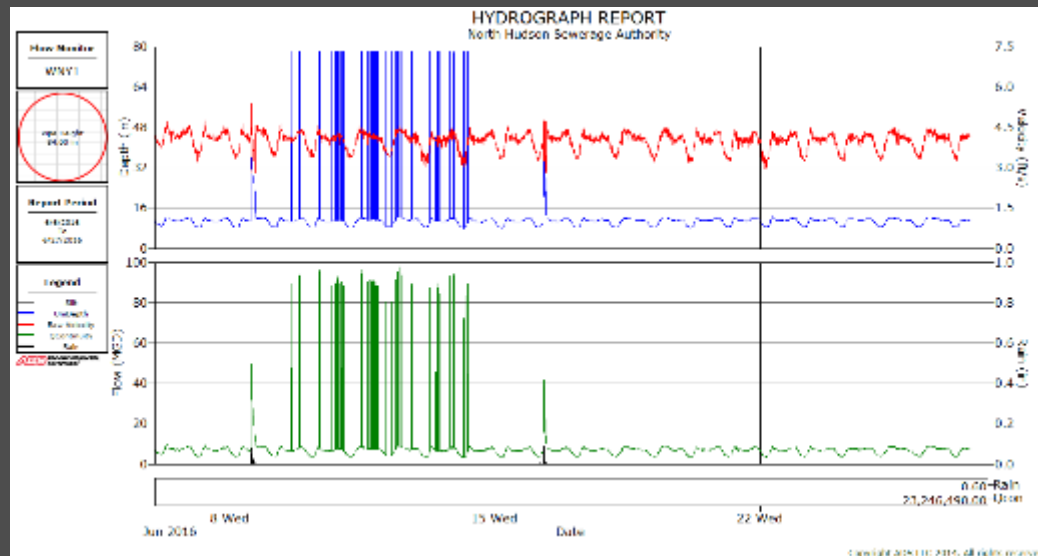


Sewer Lining Eliminates Leaks into the Sewers



Collection System Flow Monitoring

- Flow and rain measurement devices were installed in the sewer pipes in 2016.
- We collected flow data for both dry and wet weather days for 6 months.
- The data was used to calibrate computer models of the combined sewer systems.



CSO Water Quality Sampling

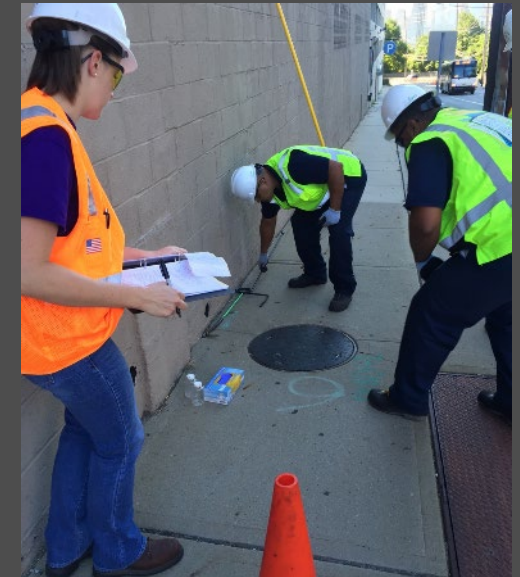
- Project Need: Better understand the quality of CSO discharges and the impacts they have on the Hudson River
- Project Goal: Collect water quality data representing CSO discharges to the Hudson River
- Project Approach:
 - Collected water samples from the sewer system where overflows occur during wet weather.
 - Tested for bacteria only.
 - Executed a NJDEP-approved project plan
- Schedule:
 - Started April 2016
 - Completed in Summer 2017.



H3 - 3rd St. at River St.



18th Street Pump Station – W 18th St.



WNY1 - JF Kennedy Blvd. at Anthony Delfino Way

CSO Tasks

What have we done so far in planning?

Consideration of Sensitive Areas Report

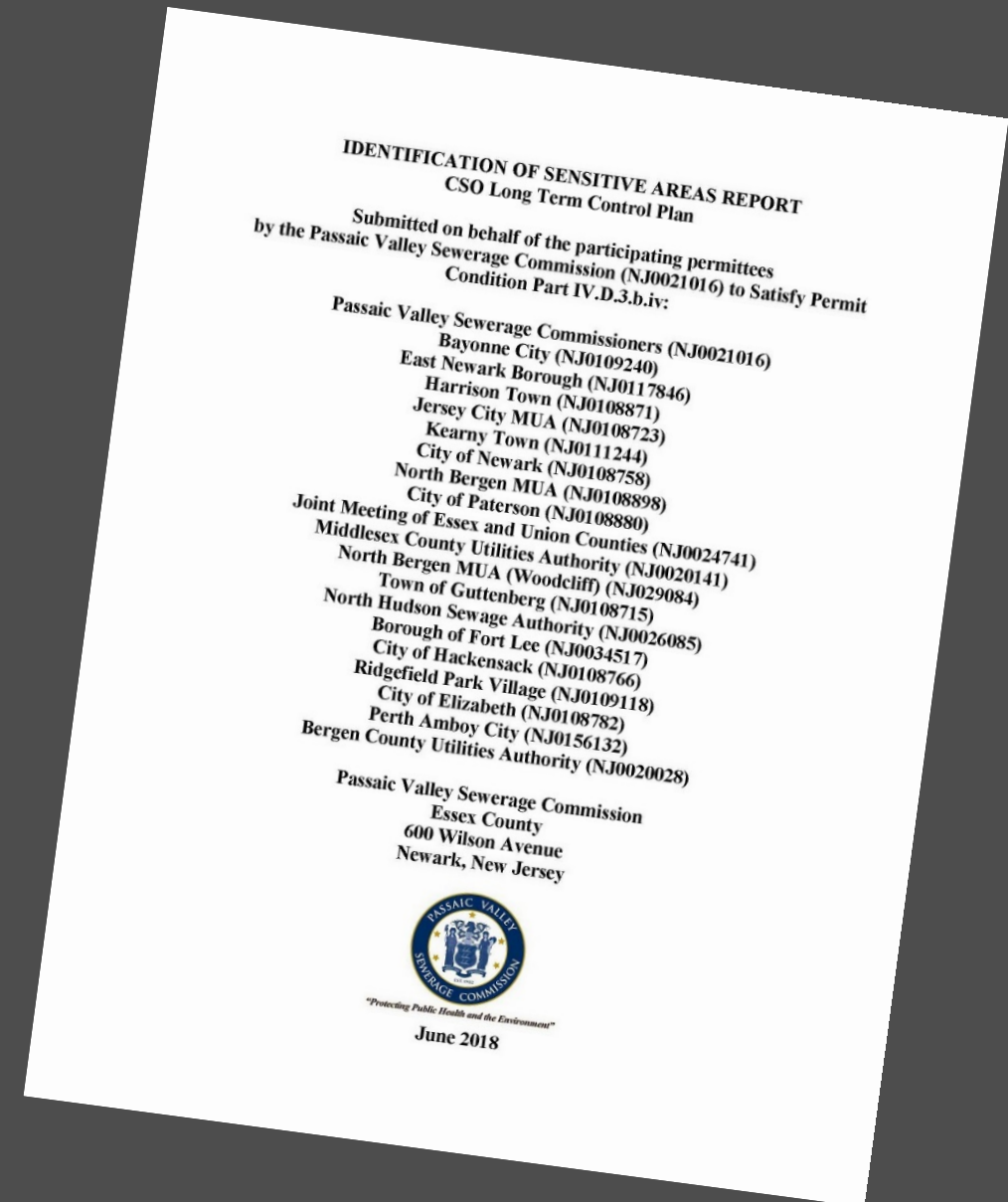
- Identified aquatic and shoreline areas that the federal government defines as sensitive to CSO discharges to be used in planning and decision making.
- The Authority also identified areas along the waterfront that are used for recreational access to the Hudson; such as marinas, beaches, and kayak launch points.

• Compliance Monitoring Program Work Plan and Report

- A plan to sample water quality in the Hudson River and adjacent waters where CSO discharges occur.
- The final report documented the findings of water quality sampling throughout the NY/NJ harbor estuary in 2016-2017 and compared the findings to water quality standards.
- The findings will serve as a baseline for planning efforts and to evaluate accomplishments as CSO controls are constructed in the future.

Identification of Sensitive Areas

- Submitted reports to NJDEP on June 28, 2018
- No:
 - Outstanding National Resource Waters
 - National Marine Sanctuaries
 - Public drinking water intakes
 - Primary contact recreation
 - Shellfish beds
- Threatened or endangered species and habitat
 - Atlantic and shortnose sturgeon – sufficiently protected
- NJDEP posted the reports on its CSO website:
 - <https://www.nj.gov/dep/dwq/cso-ltcpsubmittals.htm>



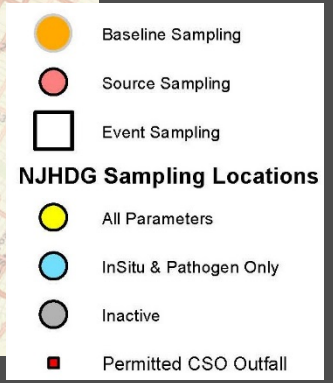
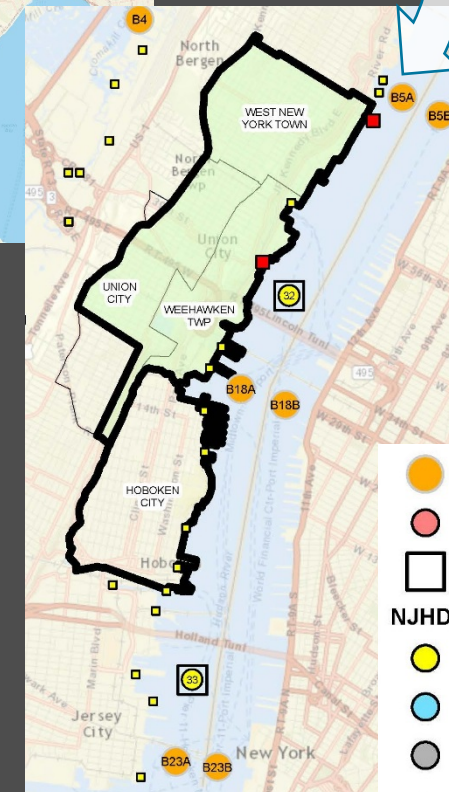
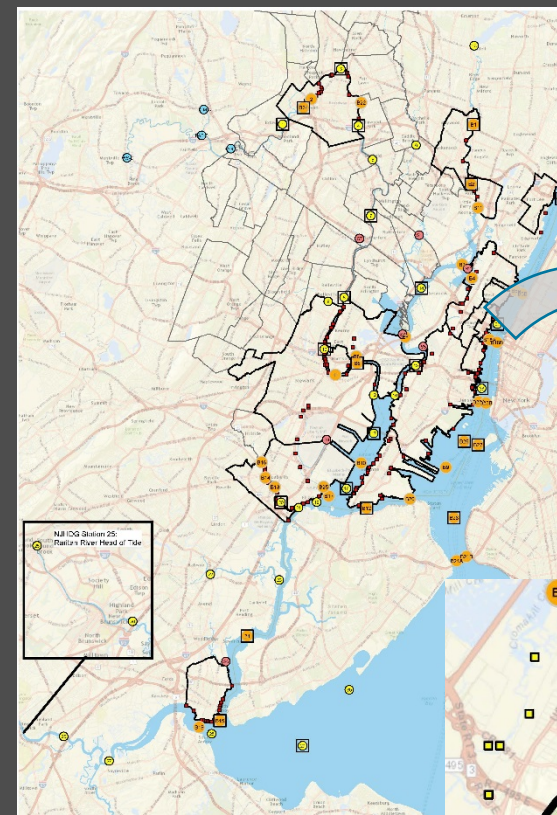
Example List of Sensitive Areas - Secondary Contact and Parks

Adams Street WWTP Service Area			
Area	Location	Activity	Nearby CSO Outfall
Sinatra Park	Between 4 th & 5 th Streets, Hoboken	Kayak Launch	Adams Street 005A
Maxwell Place Park at Hoboken Cove	11 th Street, Hoboken	Kayak Launch	Adams Street 006A
Pier 13	13 th Street, Hoboken	Marina, kayaking, jet skiing, paddle boarding	Adams Street 008A
Lincoln Harbor Yacht Club	Harbor Boulevard, Weehawken	Marina	Adams Street 013A

River Road WWTP Service Area			
Area	Location	Activity	Nearby CSO Outfall
River Road Outfall Pier	Avenue at Port Imperial, West New York	Fishing	River Road 002A

Hudson River Water Quality Monitoring

- Project Need: Better understand water quality conditions in the Hudson River and how they are impacted by CSOs
- Project Goal: Collect water quality data representing Hudson River water quality during dry and wet weather
- Project Approach:
 - Partnered with other CSO Permittees in Northern New Jersey to pool resources, not duplicate efforts and save \$
 - Executed a NJDEP-approved project plan
 - Dry and wet weather water quality samples collected by NJ CSO Group consultants by boat throughout the Harbor Estuary in 2016-2017
- Reports submitted June 26, 2018
- NJDEP posted the reports on its CSO website:
 - <https://www.nj.gov/dep/dwq/cso-ltcpsubmittals.htm>



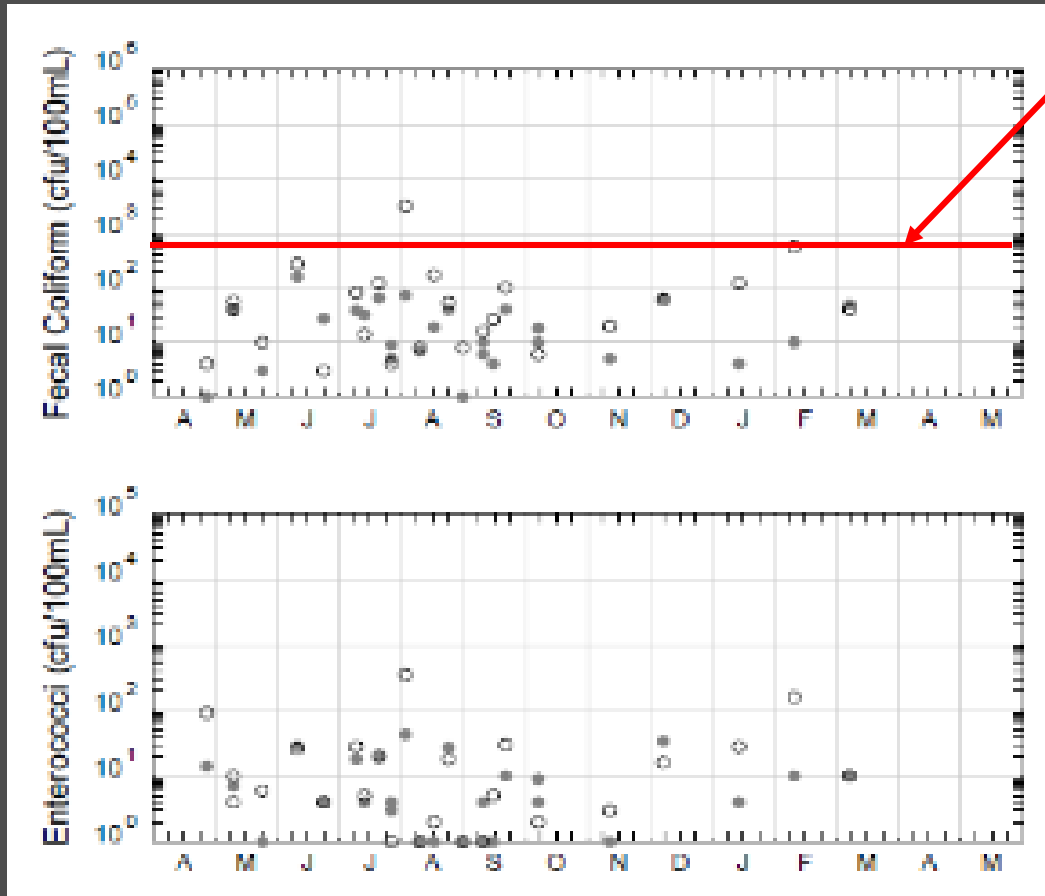
NJCSO GROUP COMPLIANCE MONITORING PROGRAM REPORT
 Prepared on behalf of the following participating Permittees by Passaic Valley Sewerage Commission (NJ0021016) to Satisfy Permit Condition Part IV.D.1.d:

Bayonne City (NJ0109240) PVSC
 East Newark Borough (NJ0117846) PVSC
 Harrison Town (NJ0108871) PVSC
 Jersey City MUA (NJ0108721) PVSC
 Kearny Town (NJ0112140) PVSC
 Newark City (NJ0108758) PVSC
 North Bergen MUA (NJ0108889) PVSC
 Paterson City (NJ0108889) PVSC
 Joint Meeting of Essex and Union Counties (NJ0024741) JMEUC
 Middlesex County Utilities Authority (NJ0020141) MCUA
 North Bergen MUA (NJ00400) NJ02064) NBMUA
 North Hudson Sewerage Authority - River Road STP (NJ0025085) NMSA
 North Hudson Sewerage Authority - Adams Street STP (NJ0025085) NMSA
 Fort Lee Borough (NJ0034517) BCUA
 Hackensack City (NJ0108766) BCUA
 Ridgely Park Village (NJ0109118) BCUA
 Elizabeth City (NJ0108782) JMEUC
 Perth Amboy City (NJ0156132) MCLUA
 Bergen County Utilities Authority (NJ0020028) BCUA

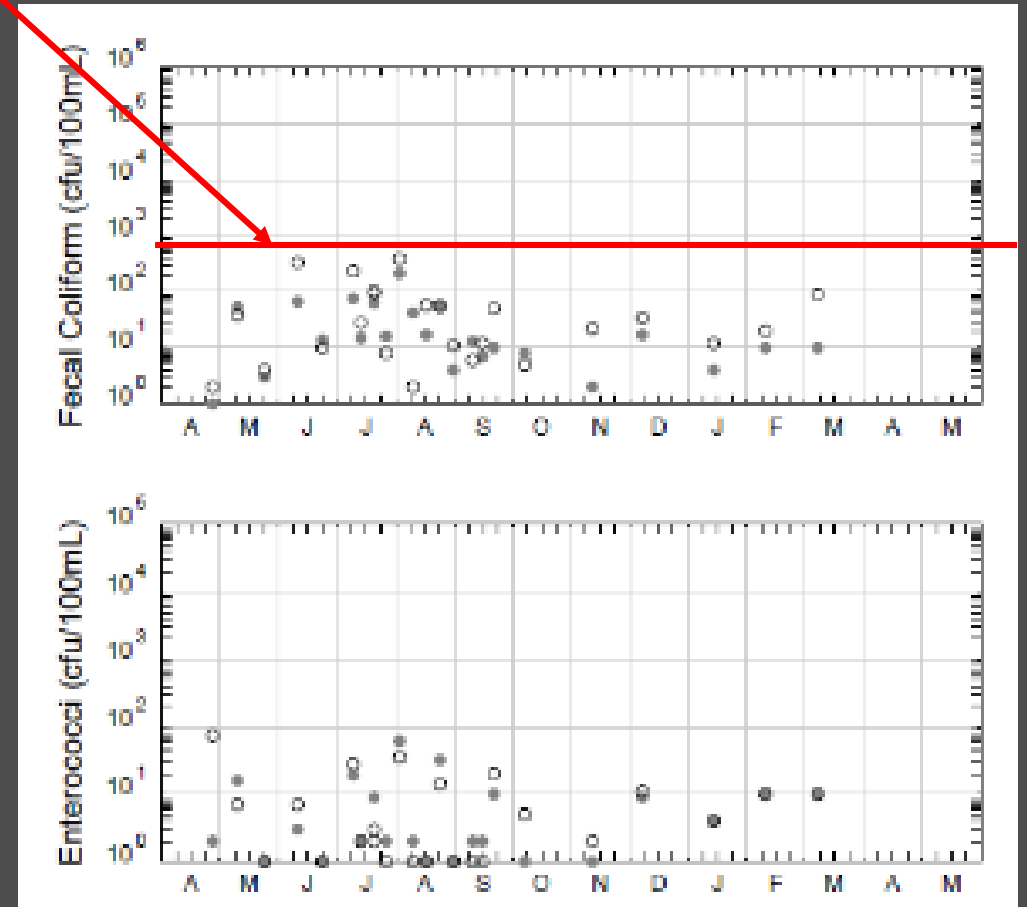
Passaic Valley Sewerage Commission
 Essex County
 600 Wilson Avenue
 Newark, New Jersey
 JUNE 30, 2018

2016-2017 Bacteria Data in the Hudson River

The bacteria water quality standard for fecal coliform is a geometric mean of 770 cfu/100mL.



*Monitoring Stations B18A at Weehawken
Hudson River – New Jersey Side*



*Monitoring Stations B18B at Weehawken
Hudson River – New York Side*

Sewer System Characterization Reports

- NJPDES Requirements:

- Establish the existing baseline conditions,
- Evaluate the efficacy of the CSO technology based controls,
- Determine the baseline conditions upon which the LTCP will be based.

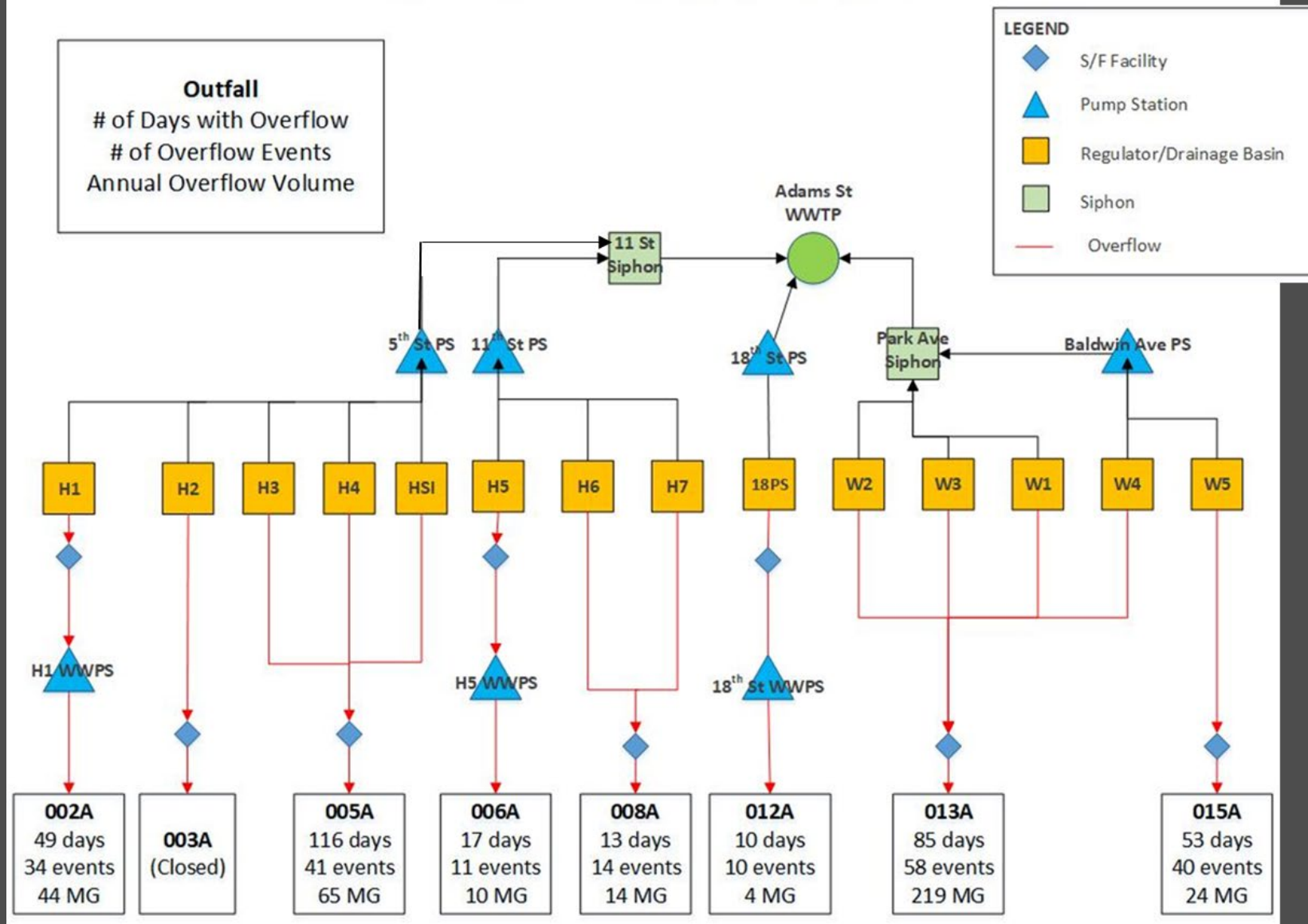
- Reports submitted July 2, 2018

- Adams Street WWTP
- River Road WWTP
- NJDEP posted the reports on its CSO website:
 - <https://www.nj.gov/dep/dwq/cso-ltcpsubmittals.htm>

- NHSA Reports Described:

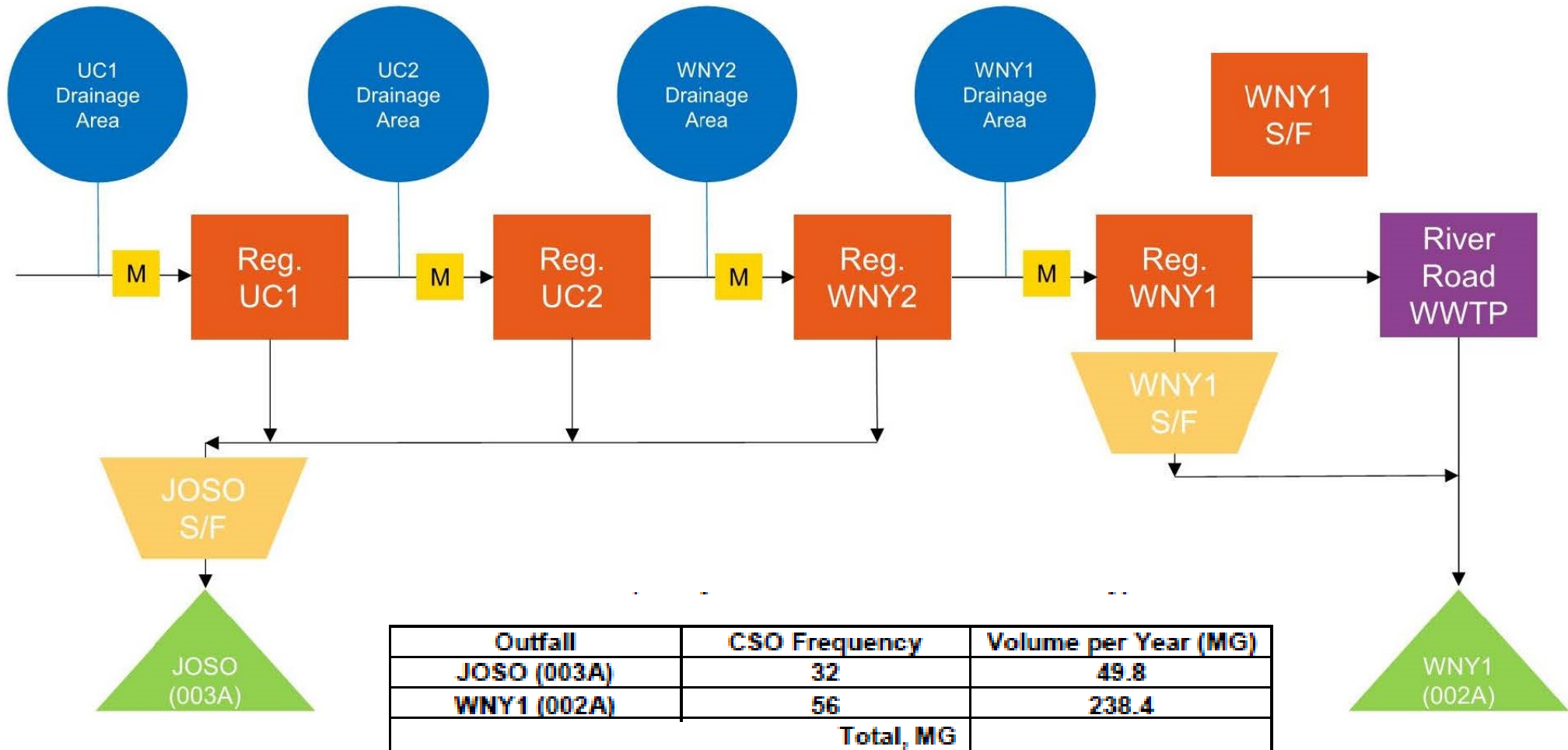
- Collection System Investigations
- Sewer System Inventory
- Wastewater Treatment Plant
- Service Area and Land Uses
- Infiltration and Inflow Assessment
- Hydraulic Collection System Modeling
- Baseline Characterization

Adams Street Schematic Diagram with Overflow Calculations



Calculated with calibrated collection system hydraulic models for a typical year

River Road Schematic Diagram with Overflow Calculations



Calculated with calibrated collection system hydraulic models for a typical year

Where Are We on Developing the LTCP?

Characterization

- Work Plans
- Field Work
 - Condition Assessment
 - Sewer Flow Monitoring
 - CSO Water Quality (WQ) Monitoring
 - Hudson River WQ Monitoring
- Identify Sensitive Areas
- Engineering
 - Land Use and Drainage Analyses
 - Hydraulic Sewer Modeling
 - Hudson River WQ Modeling
- Public Participation
- Reports

Engineering Alternative Evaluation

- Establish CSO Reduction Targets
- Identify Opportunities with Communities to Reduce CSOs
- Identify and Evaluate CSO Control Strategies and Technologies
- Estimate Potential Project Costs
- Assess Cost/Performance for Potential Projects
- Assess Financial Capability
- Identify Funding Mechanisms
- Report

Long Term Control Planning

- Select Strategies and Controls
- Select Funding Mechanisms
- Develop Schedule for Implementation
- Finalize LTCP
- Report

CSO Tasks

What have we done so far in planning?

- Development and Evaluation of Alternatives Report
 - Conducted a workshop to identify potential engineering controls to reduce CSOs.
 - Currently conceptualizing and identifying the benefits and the costs of potential CSO controls.

Summary

- The North Hudson Sewerage Authority has a long history of solving complex environmental challenges.
- Combined Sewer Overflows occur when the amount of rainfall exceeds the capacity of the sewer treatment system, and the diluted wastewater is discharged directly to the river.
- NHSA looks forward to being a leader in tackling the latest challenge of reducing Combined Sewer Overflows.
- NHSA is progressing through the five year study phase, and has completed several projects on the way to crafting a Long Term Control plan.

Next Steps

Thank You

