



Combined Sewer Overflow - Long Term Control Plan Update

DELCORA

Public Participation Meeting No. 3
LTCPU Development and Evaluation
of Alternatives for CSO Controls

December 5, 2017

Chester City Hall Community Room

1 E. 4th Street, Chester, PA



General Information

- DELCORA is the Delaware County Regional Water Quality Control Authority, established in 1971, responsible for collecting, conveying and treating wastewater in the greater Philadelphia Area including 42 Municipalities in Delaware and Chester County.

DELCORA Mission

“Provide environmentally responsible and cost effective wastewater management services to the citizens, businesses, and industries of Southeastern Pennsylvania”



Why Are We Here?

- From 1999-2009 DELCORA spent in excess of \$5 million on improvements and contributions to the City of Chester that resulted in decreased volume of overflows, reduced debris in overflows, provided remote monitoring of the system, and improved routine maintenance.
- In 2009, the DEP and EPA determined that DELCORA's LTCP was no longer in compliance with increased regulations of the Clean Water Act. In response, DELCORA began working with DEP and EPA to update the LTCP.
- In 2014, DEP and EPA determined that DELCORA's revised LTCP required further evaluation and development.
- In 2015 DELCORA signed with EPA the Long Term Control Plan Consent Decree.



Public Participation Plan Goals

- DELCORA's Goals and Objectives for the Public Participation Program are to:
 - ◆ Inform and Solicit Input to Updated LTCP from Stakeholders, including Public, Customer Communities and Regulatory Agencies
 - ◆ Educate the Public
 - ◆ Address Public Concerns





Scope of Meeting

- This Public Meeting (12/5/17) is to:
 - ◆ Review DELCOA Service Area
 - ◆ Summarize Current Status of LTCP
 - ◆ Describe CSO Control Technologies
 - ◆ Describe Next Steps Towards Development of Long Term Control Plan Update
 - ◆ Questions and Comments

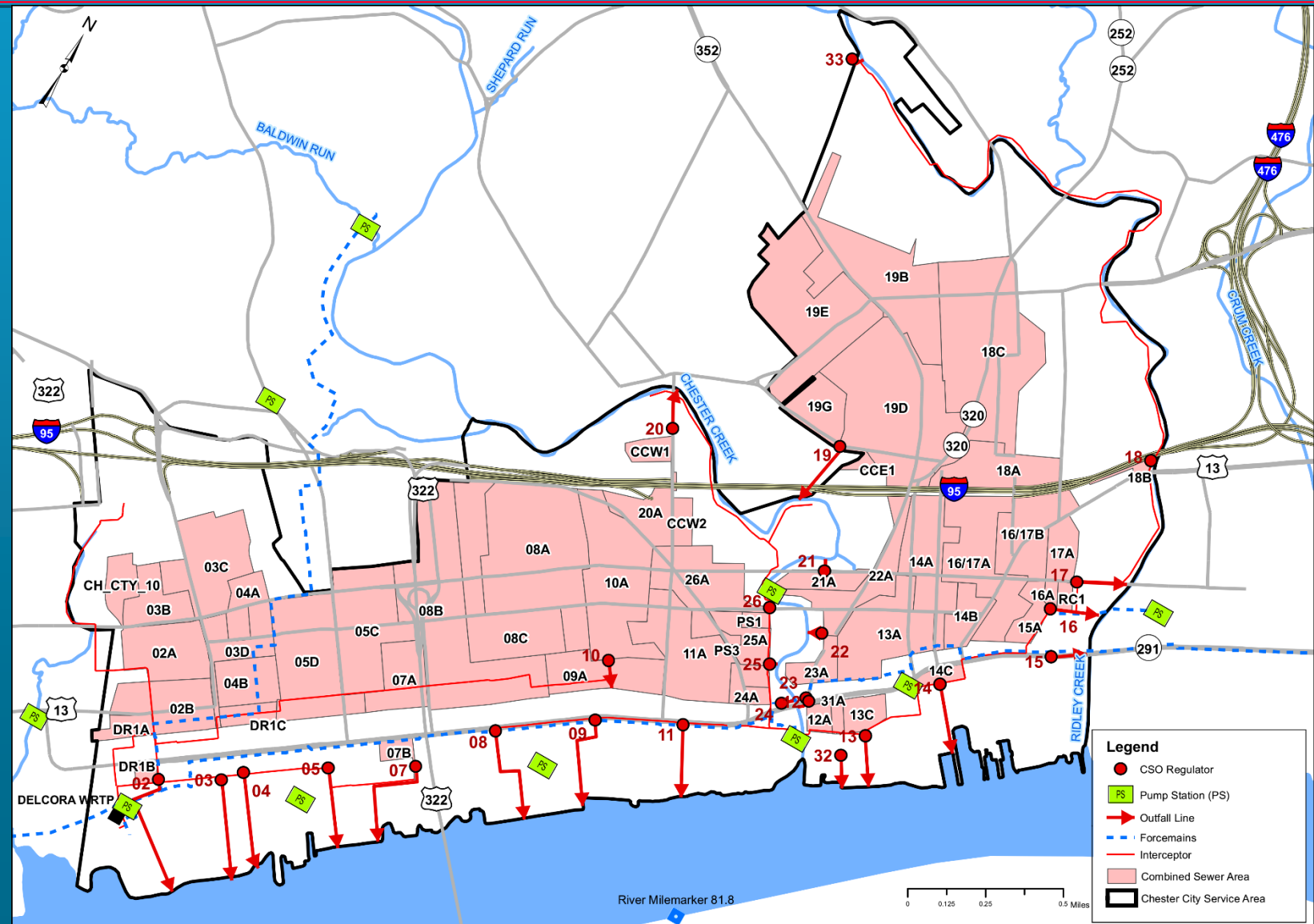


DEL CORA Service Area



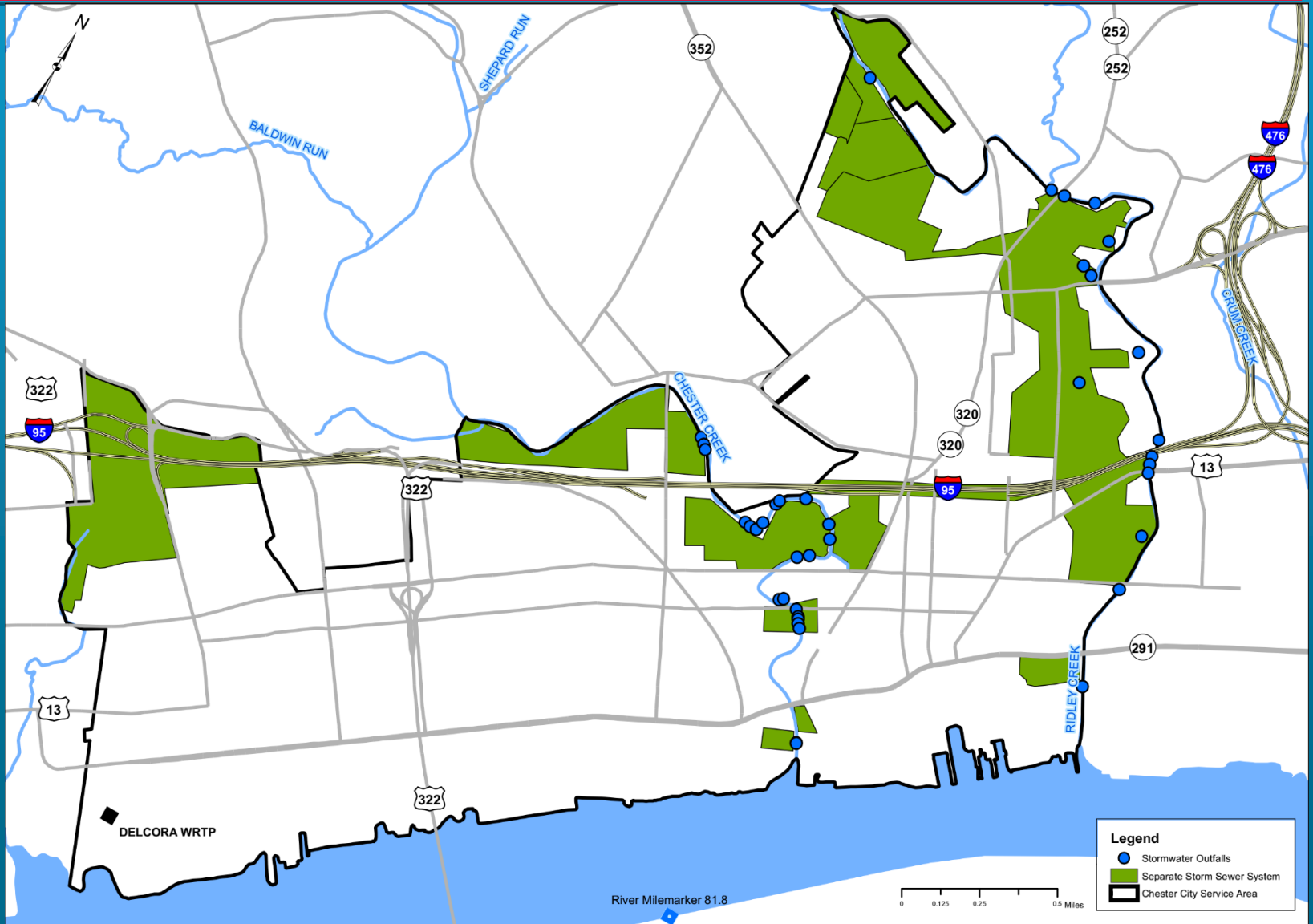


DELCORA Combined Sewer Area





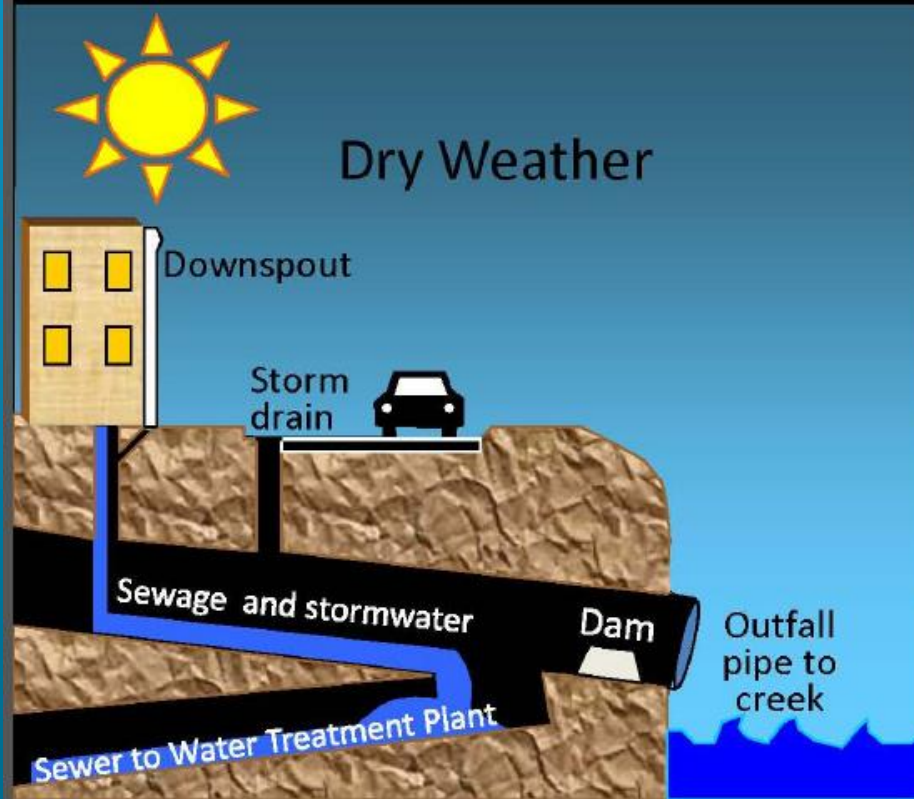
Chester City Municipal Separate Storm Sewer System (MS4)



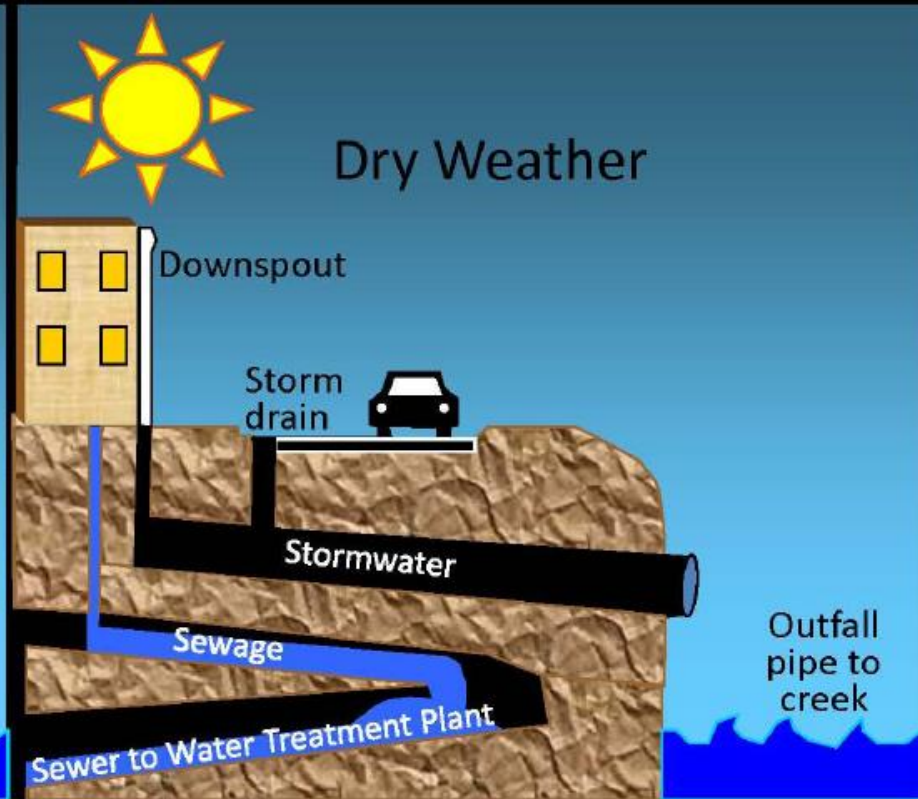


Combined Sewer System vs. Separated Sewer System

Combined Sewer



Separate Sewer

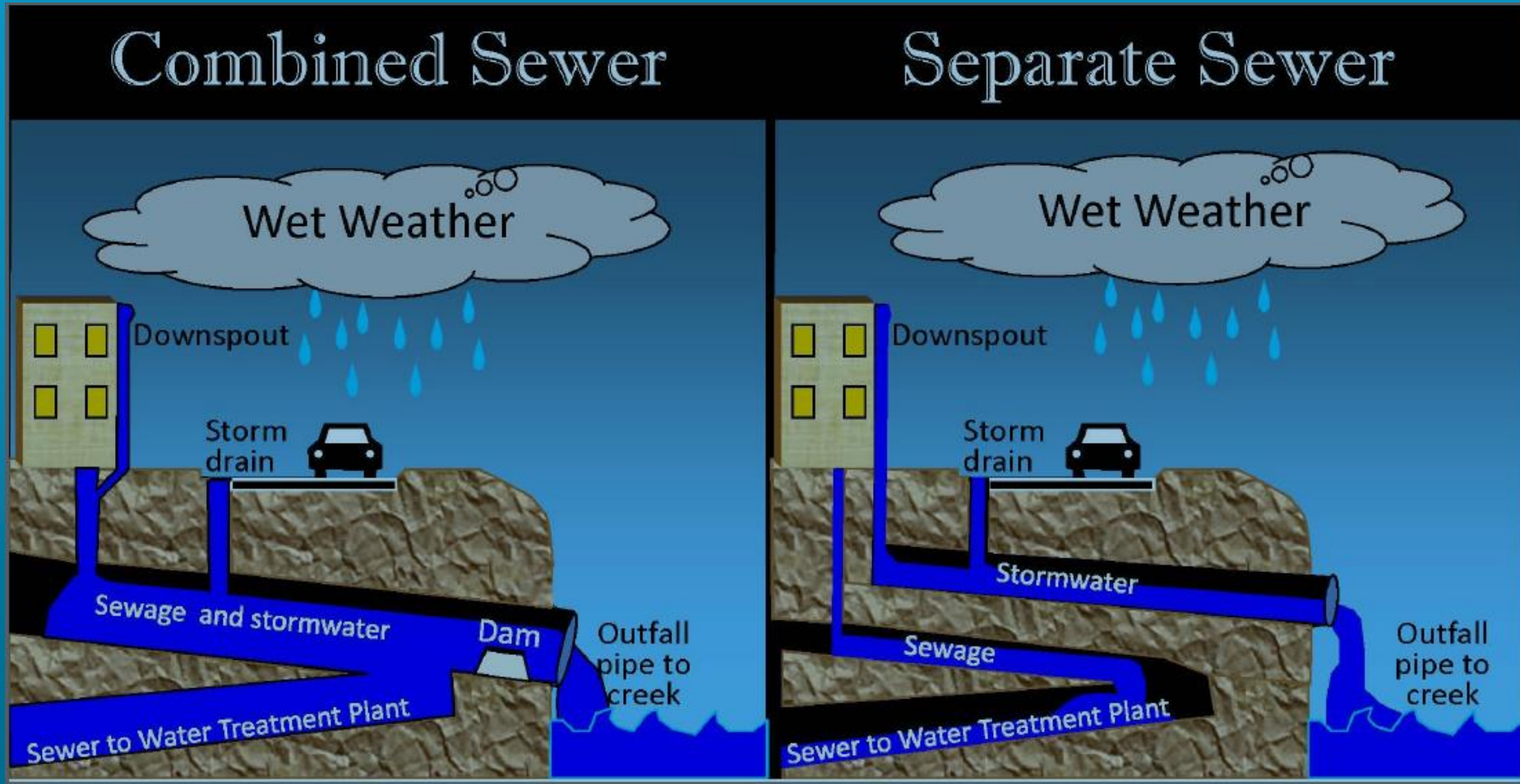


Source: City of Alexandria,

<https://www.alexandriava.gov/uploadedFiles/tes/oeq/CSSPermitInfoMeetingandPublicHearingPresentation08052013.pdf>



Combined Sewer System vs. Separated Sewer System

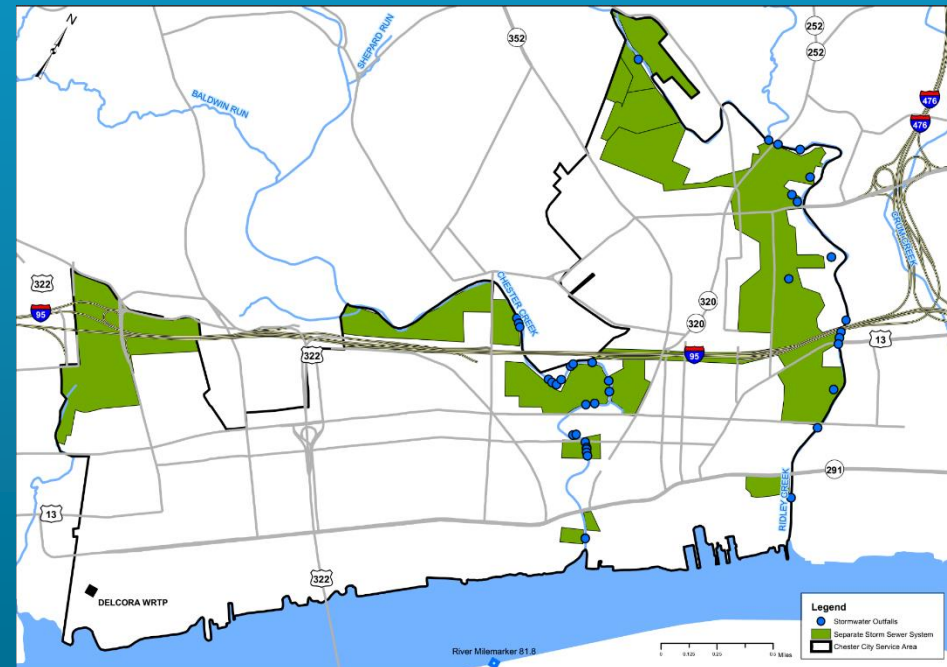
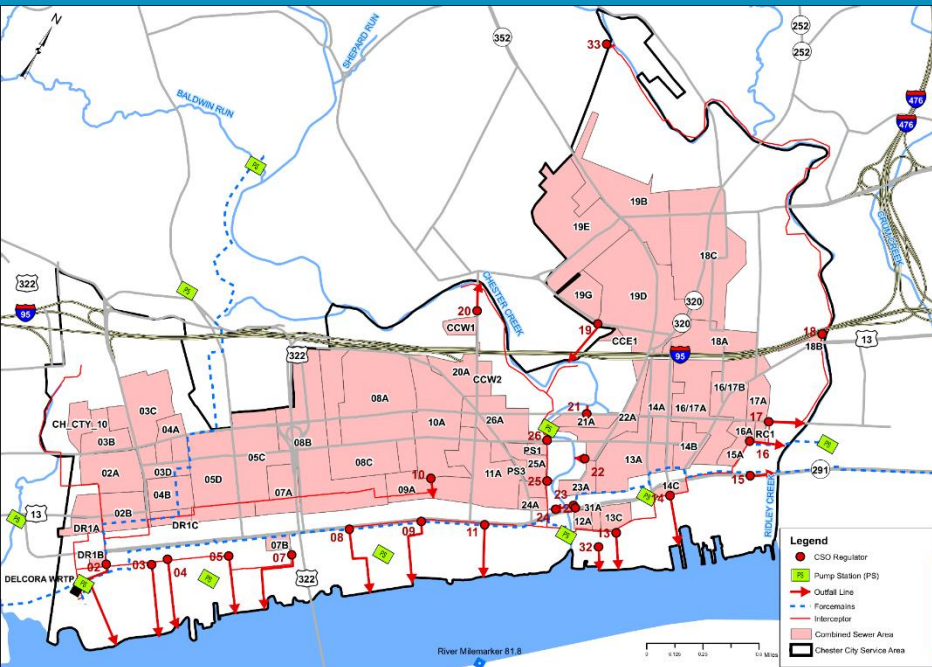


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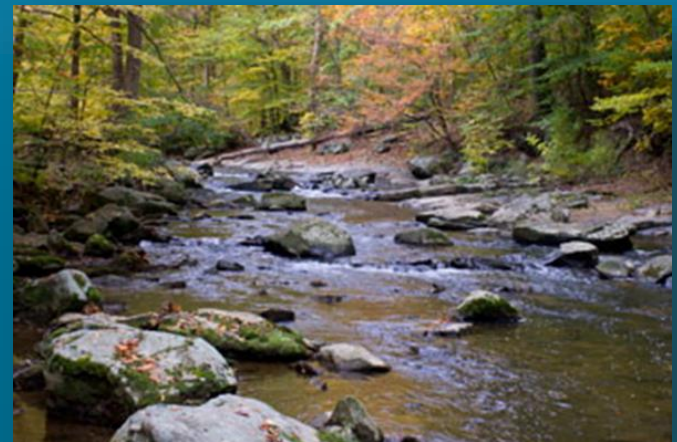
Combined Sewer vs. Storm Sewer System





LTCPU Summary - Completed

- Hired Expert Consultants with Good Track Records as Well as Experience Specifically Related to LTCP
 - ◆ Greeley & Hansen: Engineering Consultant for the LTCP
 - ◆ Municipal & Financial Services Group: Rate Model Consultant
 - ◆ Blank Rome: Law Firm
- **100% Compliant to Date with Consent Decree**
 - ◆ **Reports Submitted to Date**
 - ✓ Public Participation Plan
 - ✓ Hydrologic and Hydraulic (H&H) Model Update and Calibration Plan
 - ✓ Typical Hydrologic Period Plan
 - ✓ Semi-Annual Reports for 2015, 2016 & 2017
 - ✓ Sensitive Areas and Pollutants of Concern Report





LTCPU Summary - Completed

- ◆ 100% Compliant - Reports Submitted to Date (Continued):
 - ✓ Draft Financial Capabilities Assessment (FCA) Report
 - ✓ Alternative Evaluation Approach
 - ✓ Rainfall and Flow Monitoring Quarterly Reports for 1st , 2nd , 3rd , and 4th Quarters
 - ✓ Water Quality Monitoring and Modeling Work Plan
 - ✓ Water Quality Monitoring and Modeling Quality Assurance Project Plan
 - ✓ Study Area Collection System Model Report
 - ✓ Existing Service Area Characterization Report





LTCPU

42-Month Program Schedule & Milestones

Consent Decree Date of Lodging
August 17, 2015

Consent Decree LTCP Completion
Feb. 17, 2019

We Are Here

2015

2016

2017

2018

2019

Reports to Be Completed:

- ★ Public Participation Meeting - December 5, 2017
- ❄ Water Quality Monitoring and Modeling Report - Feb. 17, 2018
- ❁ Early Action Item, Complete PS-6 - December 2018
- ❄ Updated LTCP Final Report - Feb. 17, 2019
 - Includes Development and Comparison of Alternatives
- ❄ Updated Nine Minimum Controls Plan - Feb. 17, 2019



LTCPU Alternatives Evaluation

- Review Regulatory Requirements
- Purpose of Preliminary Screening of CSO Alternatives
- Available Technologies
- Review Preliminary Screening Evaluation Method
- Alternatives Evaluation Next Steps
- Schedule
- Questions and Comments

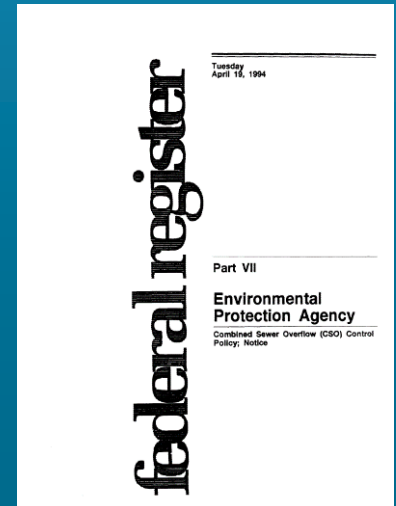




National CSO Policy Requirements

■ National CSO Policy

- ◆ Consider reasonable range of alternatives.
- ◆ Consider expansion of POTW secondary and primary capacity.
- ◆ Sufficient to Make Reasonable Assessment of Cost and Performance
- ◆ Selected Controls should be sufficient to meet CWA requirements.





Consent Decree Requirements

■ Consent Decree

◆ *Consists of:*

- *Technology screening process*
- *Detailed evaluation of specific CSO control alternatives*
- *Selection of an appropriate range of proposed CSO controls to achieve compliance with the Clean Water Act.”*
- *Does not consider cost-effectiveness (at the preliminary screening phase)*

■ Specific technologies considered feasible by Consent Decree and must be carried forward for further evaluation.

- ◆ Partial and Complete Separation of Sewers
- ◆ Deep Tunnel Storage
- ◆ Expansion of Primary and Secondary Capacity of WRTP
- ◆ Green Infrastructure

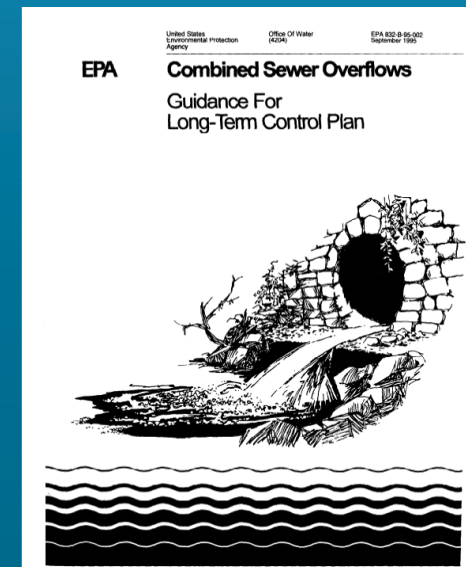


USEPA CSO Guidance for LTCPs

■ CSO Guidance for Long Term Control Plan

◆ *“Can include technologies, operating strategies, public policies and regulations, or other measures that would contribute to some aspect of CSO control. Control measures can generally be classified under one of the following categories:*

- *Source Controls*
- *Collection System Controls*
- *Storage Technologies*
- *Treatment Technologies”*





Preliminary Screening

■ Purpose of Preliminary Screening

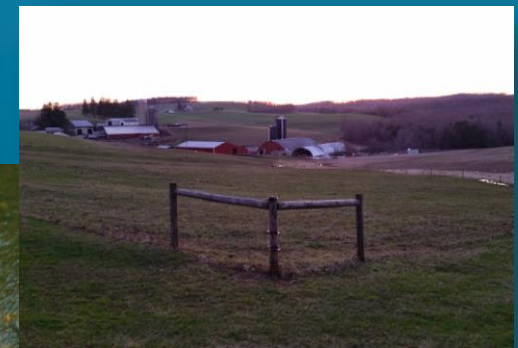
- ◆ Identify alternatives that best meet CSO Control Alternatives with least overall impacts and are worthy of additional evaluation.
 - Meet regulatory requirements.
 - Reduce Pollutants of Concern (bacteria) and/or volume reduction.





Preliminary Screening

- Pollutants of Concern (POCs) Approved by USEPA
- Bacteria: **Fecal Coliform, E. Coli, and Enterococcus**
- Other Sources of Bacteria from Tributary Flows to Chester and Ridley Creeks:
 - ◆ Pets, Wildlife, Livestock and Stormwater Runoff (Urban and Agricultural)





Preliminary Screening

■ Methodology

- ◆ Develop comprehensive list of technologies for each type of CSO Control Measure (Source, Collection System, Storage, Treatment).
- ◆ Assign levels of effectiveness at reaching CSO Control Goals for reduction in bacteria or CSO volume

High

Medium

Low

None



Preliminary Screening

- **High** Significant Impact on CSO Control Goal and is Among Best Technologies Available
- **Medium** Effective at Achieving CSO Control Goal but is Not Considered Among Most Effective
- **Low** Minor Impact on CSO Control Goal
- **None** Zero or Negative Effect on CSO Control Goals



Preliminary Screening

- Retain technology if level of effectiveness is “HIGH” or “MEDIUM” based on volume or bacteria reduction.
- Retain technologies as required by Consent Order regardless of ranking.
 - ◆ Partial and Complete Separation of Sewers
 - ◆ Deep Tunnel Storage
 - ◆ Expansion of Primary and Secondary Capacity of WRTP
 - ◆ Green Infrastructure
- Develop alternatives from retained technologies.



Source Control

- Impact Quality or Quantity of Runoff Entering CSS; Reduce Volumes, Peak Flows or Pollutant Discharge
- Source Control Alternatives
 - ◆ Stormwater Management
 - ◆ Public Education and Outreach
 - ◆ Ordinance Enforcement
 - ◆ Good Housekeeping
 - ◆ Green Infrastructure
 - Buildings
 - Impervious Areas
 - Pervious Areas

Look for and check your sewer cleanout. The cleanout usually is a small pipe, about 4 inches in diameter, outside your house or business that is used to access the service lateral for cleaning the sewer line. You can find it near the house, where the service lateral comes out, and/or near the street, where the service lateral connects to the main sewer line. Make sure the cap to the cleanout pipe is on and has not been damaged by a lawn mower or something else. Replace missing caps; otherwise, rain can get into the sewer line, causing it to overflow.

Avoid pouring grease down your sink. When the grease cools in the sewer line, it can form clogs and blockages, which then can cause the sewer to overflow or back up into buildings. The grease also can contribute to restricted flow in your home plumbing and service laterals, resulting in costly repairs.

Avoid planting trees and shrubs above or near the service lateral that runs from your building to the street. Roots can enter and clog sewers, causing them to back up and overflow.


Learn about your local sewer system. Contact your local sewer authority or department of public works, and ask them to describe how the system works. Ask for the general location of the main sewer (line and treatment plant(s)) and what type of monitoring is being conducted to detect SSOs.

Support local programs that aim to improve the way your sanitary sewer system is maintained and operated. Proper operation and maintenance of the sanitary sewer system are key to preventing the damage caused by SSOs and prolonging the life of the sewer system, saving taxpayer dollars.

The brochure is provided by: Citizens Environmental Research Institute and funded by the U.S. Environmental Protection Agency, Cooperative Agreement Number: 833 No. CR2005-01. For more information about SSOs contact:

Citizens Environmental Research Institute
225 Main Street, Suite Z
Farmington, NY 11735
Web site: <http://www.cerri.org>
Phone: 845-339-4900 Fax: 845-339-7943


DELCORA
100 East Fifth Street, P.O. Box 999
Chester, PA 19380-0999
Web site: <http://www.delcora.org>
800-878-8222 Fax: 610-371-1111




TOP SEVEN TERMS FOR BETTER UNDERSTANDING SSOs:

- 1. INFILTRATION.** The water entering a sanitary sewer system through pipe joints, line breaks or cracks.
- 2. INFLOW.** Runwater from roofs, pavements, yards, manholes, and manhole covers that flows directly into a sanitary sewer.
- 3. SERVICE LATERAL.** The sewer pipe that connects a house or other building to the main sewer line in the street.
- 4. SEWER CLEANOUT.** A small pipe with a cap, located near the floor in a house or other building where the service lateral enters. The cleanout is used to free blockages that may form in the service lateral.
- 5. PATHOGENS.** Organisms in raw sewage that cause diseases, including cholera, dysentery, hepatitis, and gastroenteritis.
- 6. MANHOLE & MANHOLE COVER.** A structure, usually found in a street, parking area, or sidewalk, that is used to provide access to the main underground sewer lines.
- 7. COLLECTION SYSTEM.** The series of progressively larger pipes through which sewage is carried from homes and businesses to a treatment plant. The collection system includes service laterals and the main sewer lines.

SANITARY SEWER OVERFLOWS



What are they?
Why are they a problem?
What can we do about them?



A Citizens Guide



Green Infrastructure

- Green Infrastructure is an approach to water management that protects, restores or mimics the natural water cycle.
- Treats stormwater locally at the source.
- Includes rain gardens, bioswales, permeable pavement, green roofs, downspout disconnections, etc.





Green Infrastructure: Community Impacts

- **Environmental Impact:** Low Bacteria and Medium Volume Reduction
- **Social Impact**
 - ◆ Potential Development of Green Spaces in Areas Without It
 - ◆ Bioswales may reduce parking and narrow streets.
- **Financial Impact:** Costs of green infrastructure have been higher than gray; may have an impact on rates if used for LTCP compliance



Examples of Green Infrastructure Projects



Collection System Control Technology

- Reduce CSO volume and frequency by removing or diverting stormwater runoff to maximize capacity of collection system.
- Collection System Control Technology Alternatives
 - ◆ Inflow/Infiltration Control
 - ◆ Operation and Maintenance
 - ◆ Combined Sewer Separation
 - ◆ Combined Sewer Optimization





Inflow and Infiltration Reduction

- ◆ I&I is water that enters Collection System through cracks, joints, etc.
- ◆ Rainfall and Groundwater Driven
- ◆ Some I&I is expected
- ◆ If removed, frees up capacity that would otherwise be available for combined sewage and adds to CSOs.





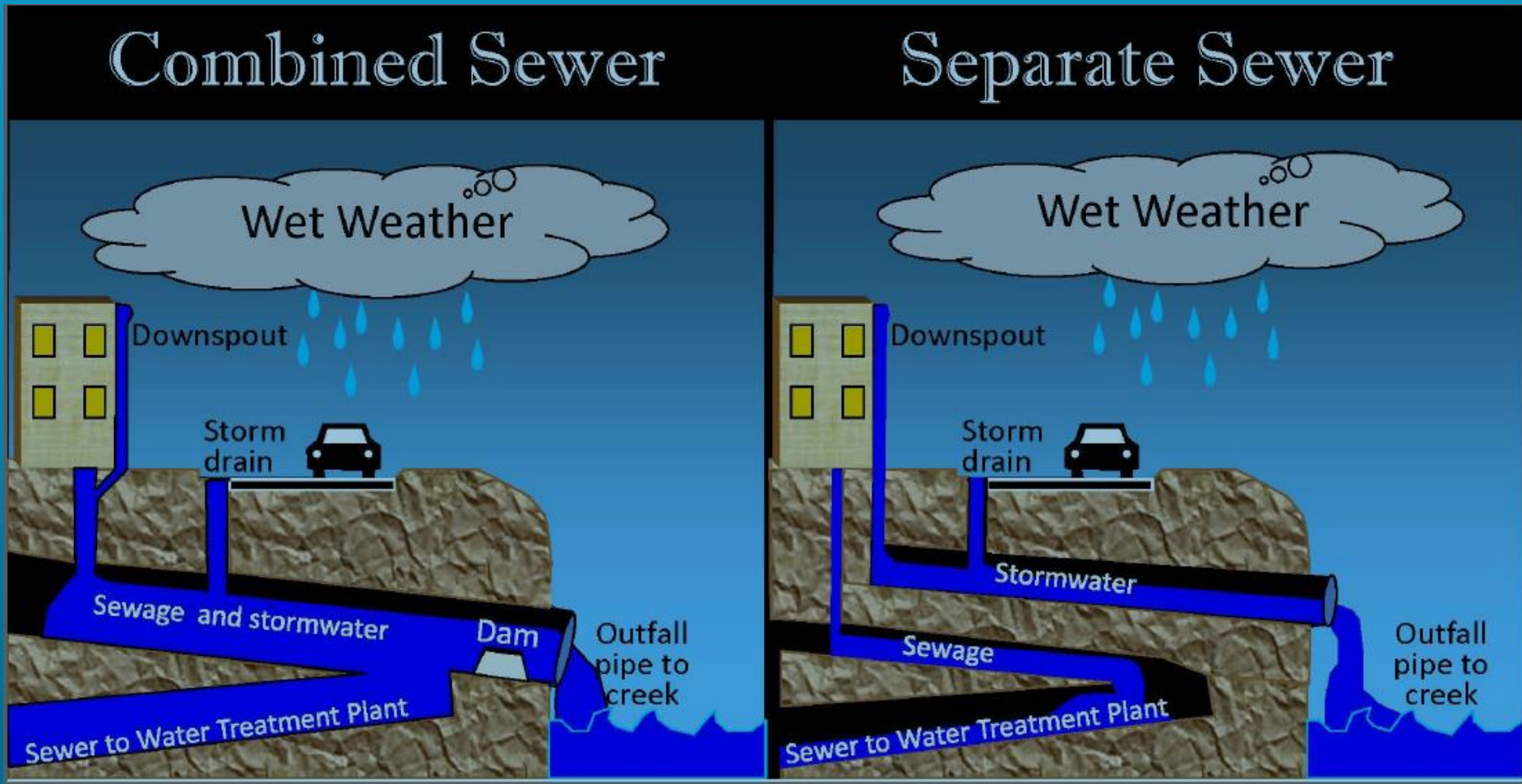
Inflow and Infiltration: Community Impacts

- **Environmental Impact:** Low Bacteria Reduction and Medium Volume Reduction
- **Social Impact:** Repairs on Private Property Required by Homeowners
- **Financial Impact:** Can be cost effective if sources of I/I are easily identified.





Combined Sewer Separation



Source: City of Alexandria,

<https://www.alexandriava.gov/uploadedFiles/tes/oeq/CSSPermitInfoMeetingandPublicHearingPresentation08052013.pdf>



Combined Sewer Separation: Community Impacts

- **Environmental Impact:** Highly Effective in Reducing CSOs
- **Social Impact:** Disruptive to Affected Areas Due to Street Closures and Construction Access
- **Financial Impacts**
 - ◆ High Costs Due to Street Construction and Replacement
 - ◆ Long Construction Duration





Storage Technology

- Reduce overflows by capturing and storing excess wet weather flows.
- Control release of combined sewage back into system once treatment and conveyance capacity have been restored.
- Does not prevent water from entering Combined Sewer System or treat bacterial loads in CSO discharge; effective at reducing or eliminating CSO events.
- Storage Technology Alternatives
 - ◆ In Line Storage
 - ◆ Off Line Storage



Increased Collection System Storage

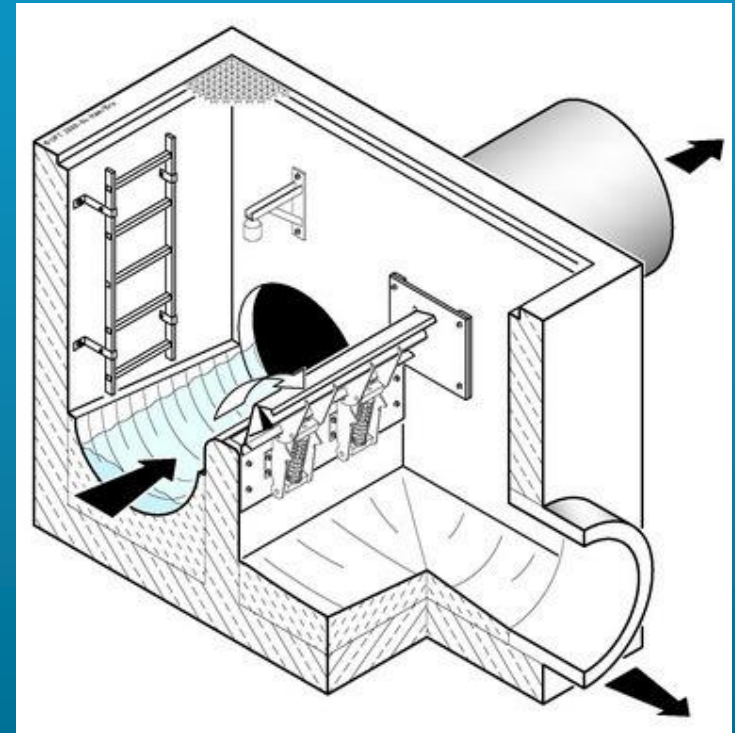
- ◆ Capture and hold volume until conveyance and treatment capacity return.
- ◆ In line storage uses existing collection system for storage.
- ◆ Off line storage includes the construction of Storage Tanks and Tunnels.





In Line Storage: Community Impacts

- **Environmental Impact:** High Bacteria and High Volume Reduction
- **Social Impact:** Minimal Impact on Community During Construction
- **Financial Impact:** Very Cost Effective Using Existing Infrastructure



Bending weir in regulator structure



Off-Line Storage: Community Impacts

Deep Tunnels

- **Environmental Impact:** Highly Effective in Reducing CSOs
- **Social Impact:** Construction Disturbances at Each Shaft Location which May be Sited in Locations to Minimize Public Disturbance
- **Financial Impact:** Cost Effective at High Removal Volumes





Off-Line Storage: Community Impacts

Storage Tanks

- **Environmental Impact:** Highly Effective in Reducing CSOs
- **Social Impact:**
 - ◆ Construction Disturbances at Tank Location Only
 - ◆ Can be Buried Under Playgrounds, Parking Lots or Other Community Structures
- **Financial Impact:** Cost Effective at High Removal Volumes



Examples of Storage Tank Projects from Methuen Construction Co.





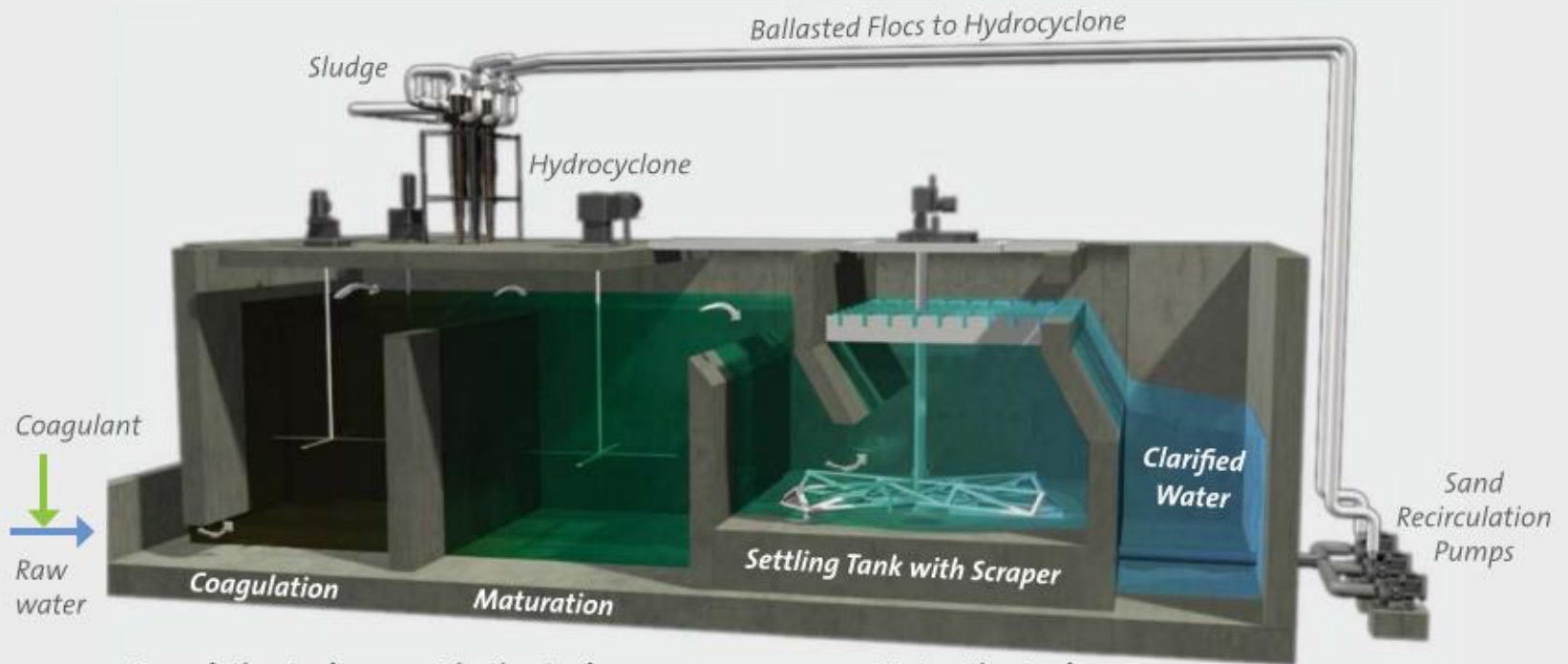
Treatment Technology

- Reduce pollutant loads to receiving waters by treating wet weather flows.
- Addresses different pollutant constituents like settleable solids, floatables or bacteria.
- LTCPU will contain provisions for handling, treatment and ultimate disposal of sludge and residuals .
- Treatment Technology Alternatives
 - ◆ CSO Facility - Satellite Treatment
 - ◆ WRTP - Additional Treatment Plant Capacity, Wet Weather Blending
 - ◆ Industrial - Industrial Pretreatment



Satellite Treatment of CSO Discharge

Recirculation: settled material is pumped to the hydrocyclone for separation and microsand recovery



Coagulation tank:
pin floc formation

Injection tank:
ballasted floc formation begins
and microsand is re-injected

Maturation tank:
ballasted floc formation continues
with optimum mixing gradients



Satellite Treatment Facility: Community Impacts

- **Environmental Impact:** High reduction of bacteria and CSO volume with disinfection
- **Social Impact:** Construction in collection system isolated to selected site.
- **Financial Impact:** Additional cost required for treatment equipment and disinfection.





Treatment or Storage at WRTP

- ◆ Convey additional flow to WRTP for treatment; Plant is already at Wet Weather Capacity so would require plant expansion.
- ◆ Use Study Area Collection System Model to evaluate sending additional flow to WRTP in order to consider potential overflow reduction.





Secondary Treatment Bypass

- ◆ Convey additional flow to WRTP for treatment.
- ◆ Blend primary treated effluent with secondary/biological treated effluent.
- ◆ Alleviates plant expansion needs to handle additional flows.
- ◆ Additional conveyance required.





Improvements at WRTP: Community Impacts

- Environmental Impact: High Bacteria and CSO volume reduction
- Social Impact:
 - ◆ No repairs on private property
 - ◆ Minimal street closures
- Financial Impact: Cost Effective Due to Available Land on Existing Plant Site and Shared Services with Existing Plant Operations





Alternatives Evaluation Next Steps

- LTCP CSO Control Alternative Evaluation
 - Alternatives Development and Modeling
 - Alternatives Cost / Performance Evaluation
 - Rating, Ranking and Recommendation
 - Financial Plan



LTCPU Program Schedule

- Consent Decree Deadlines and Schedule
 - ◆ Final Water Quality Monitoring and Modeling Report submitted by February 2018.
 - ◆ Final LTCPU Report due to USEPA by February 2019.
 - ◆ Early Action Items - End of 2018





LTCPU Consent Decree Early Action Item

- Consent Decree requires Early Action Combined Sewer Overflow Control Measures to reduce Combined Sewer Overflows.
- New Pump Station - PS-6
 - ◆ Increased Capacity of Existing Pump Station at Western Regional Treatment Plant
 - ◆ Anticipated \$15 Million Construction Cost
 - ◆ To be Completed by December 31, 2018



LTCPU Consent Decree Early Action Items

New Pump
Station Under
Construction





Future Public Meetings

■ 4th Meeting

Topic: **Selection and Implementation of the Long-Term Plan**

When: 3rd Quarter 2018

Where: Aston Township Administration Building
5021 Pennell Road; Aston, PA 19014





Literature and Documentation

- Literature and Documentation will be Made available by DELCORA at the following public locations and on the DELCORA Website:

- ◆ **DELCORA Administration Building**

100 East Fifth Street; Chester, PA 19013

- ◆ **Lewis Crozer Library**

620 Engle Street; Chester, PA 19013

- ◆ **Marcus Hook Municipal Building**

1015 Green Street; Marcus Hook, PA 19061

- ◆ **Ridley Township Building**

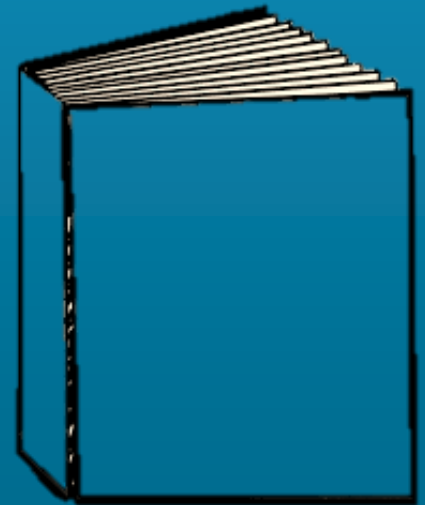
100 MacDade Blvd.; Folsom, PA 19033

- ◆ **Upland Borough Office**

224 Castle Avenue; Brookhaven, PA 19015

- ◆ **Chester Township**

1150 Engle Street; Chester, PA 19013





DEL CORA Website

www.delcora.org



CONTACT DELCORA

■ Mail Address

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Chester, PA 19016-0999

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■ General Phone Number: 610-876-5523

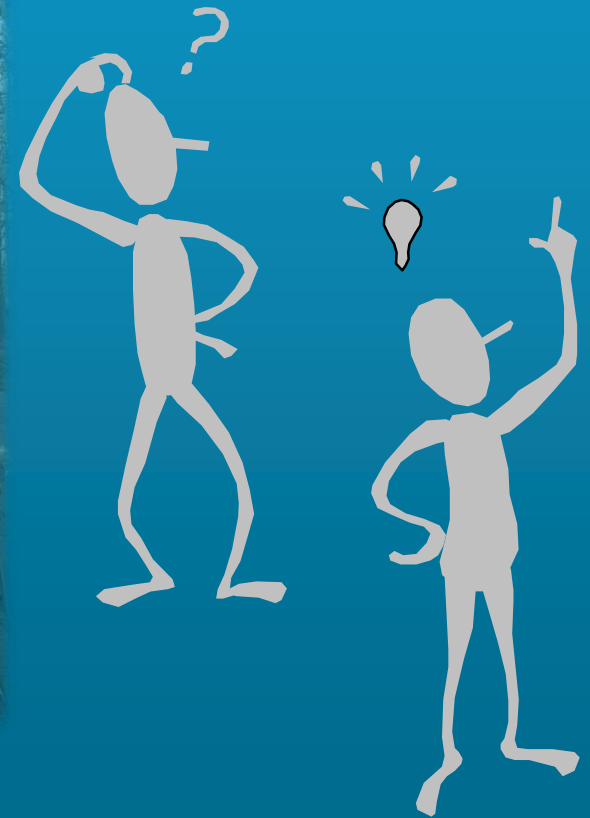
■ Newsletter

■ Sign-Up Sheet

-Thank You-

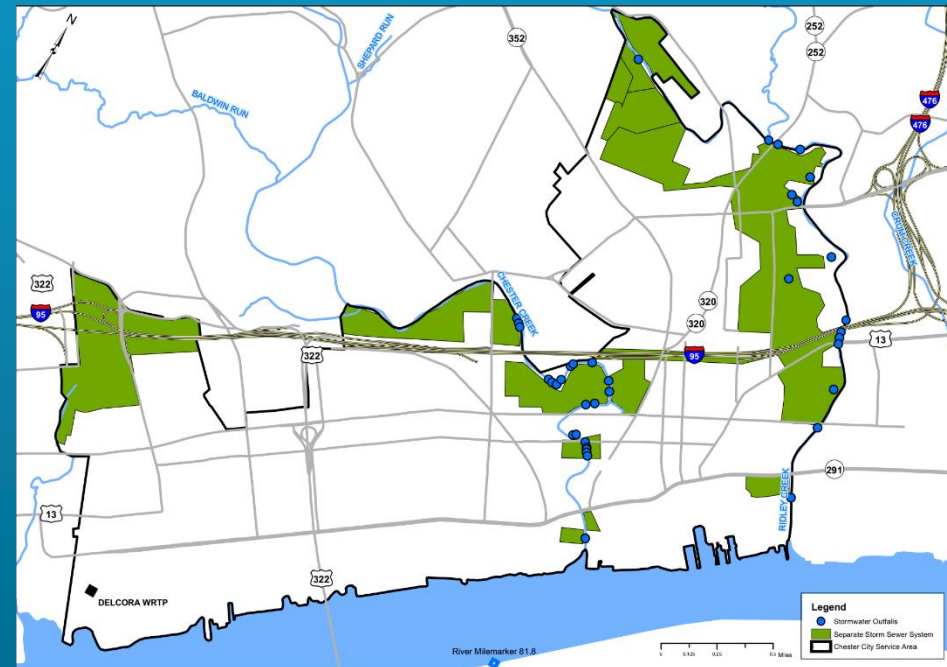
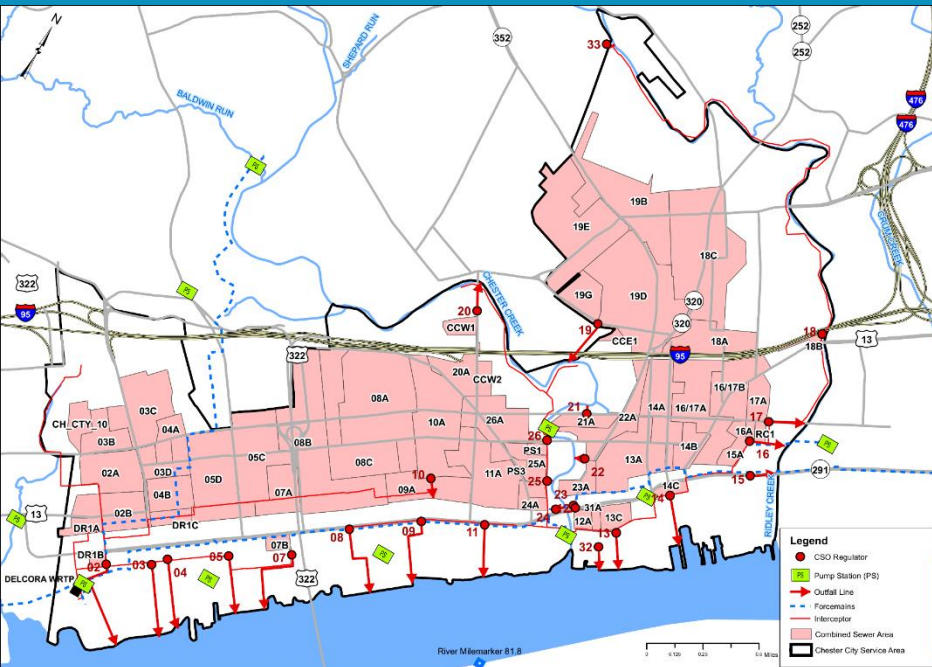


Discussion - Q&A





Combined Sewer vs. Chester City's MS4





End of Presentation