City of Elizabeth & JMEUC: CSO Control Solutions

Supplemental CSO Team

Informational Presentation #2 – Selecting a CSO Control Plan
Introduction

• The City of Elizabeth Public Works Department is responsible for all of the City's infrastructure, including:
  • Engineering services for roads, utilities, and public buildings and facilities owned or operated by the City, including the City’s sewer system
  • Joint Meeting of Essex and Union Counties (JMEUC) is responsible for the wastewater treatment facility which treats wastewater flows, and for the sewer system for upstream communities

• The goals of this presentation are to:
  1. Provide information about combined sewer overflows (CSOs) and the Elizabeth sewer system
  2. Obtain input on the City and JMEUC’s plans to reduce CSOs
What is a Combined Sewer Overflow (CSO)?

- Most of Elizabeth’s sewers are **combined sewers**, which means that they carry both sanitary sewage and stormwater in one piping system.
- When it rains, to prevent flooding in streets and basements, sewers fill up and release excess flow to nearby water bodies. This is called a **Combined Sewer Overflow (CSO)**.
- CSOs can result in contaminants entering the Elizabeth River, Arthur Kill and Newark Bay.
- Elizabeth has **29 locations** where CSOs discharge.
- The City and JMEUC evaluated a range of alternatives to reduce CSOs to improve water quality → **we want your input on the selected program!**

When it’s **Dry**:

When it’s **Wet**:
Alternatives Considered for CSO Control

1. Expand Treatment Plant and Send More Flow to It
2. Build Separate Sewers (one sanitary and one storm)
3. Build Underground Storage Tanks
4. Build a Tunnel to Store and Send Flow to Treatment Plant
5. Treat Overflows at Each Outfall
6. Build Rain Gardens and Other Natural / Green Systems
7. Reduce Leaks into the Sewers

Range of alternatives
1. Expand Treatment Plant and Send More Flow to It

- Upgrade the Trenton Avenue Pumping Station, so that more flow can be sent to the JMEUC Treatment Plant
- Upgrade the JMEUC Treatment Plant so that it can treat (clean) more flow coming from the City during rain events
2. Build Separate Sewers

• Right now, one sewer pipe carries both sanitary and storm flows
• This alternative involves installing a parallel sewer system so there will be one for storm flow and one for sanitary flow
• During rain events, the storm sewer may still overflow, but it no longer has sanitary contaminants in it – CSOs are eliminated!
• May not be suitable for the entire City because of the traffic disturbance to dig up roads to install sewer, but may be suitable for some parts of the City.
3. Build Underground Storage Tanks

- CSO flows would be redirected to an underground storage tank at each outfall
- No overflows would occur until tank is full
- After the rain event is over, the contents of the tank are pumped back into the sewer pipe and sent to the treatment facility
- Requires a large amount of land to be purchased across the City for the tanks. Could require demolition of existing buildings and preventing new developments.
4. Tunnel Storage through City

- Construct a 20,000 ft long tunnel under the City (as long as 55 football fields!)
- The tunnel will store CSO flows instead of sending them to the river. After the rain event is over, the contents of the tunnel are pumped to the treatment facility.
- Must cross under the river multiple times.
- Excavation is very costly but might be less disruptive to the City than some of the other alternatives.

Example: Narragansett Bay Commission
5. Treat the Overflows at the Outfalls

- CSO flows would be redirected to a treatment facility at each outfall location
- The facility would treat the water to remove solids and disinfect it
- Testing at a few locations would need to be done first to confirm the effectiveness of the treatment

Example: High-Rate CSO Treatment Facility in Bremerton, WA
6. Reduce Leaks into the Sewers

**Inflow/Infiltration:**

When groundwater and stormwater seep into the sewer system through defects like cracked pipes, faulty manholes or illegal connections.

- Inflow/infiltration can be reduced by lining all of the pipes to reduce leaks into them.
- However, this is very expensive compared to other alternatives.
7. Build Rain Gardens and Other Natural / Green Systems

The City of Elizabeth is working to identify locations around the city where green infrastructure would be a good fit.

A rain garden is a type of green infrastructure that allows rain to be naturally absorbed into the ground instead of flowing into the sewer system.

Kenah Field Park Rain Garden

Trumbull Street Green Infrastructure (under construction)
The City wants to select a CSO control approach that balances:

- The plan should meet water quality objectives
- The plan should be cost effective
- The plan should be acceptable to City residents: traffic impacts, disturbance, noise, appearance, etc.

We want your input!
CSO Plan Elements

- The City is proposing a CSO control plan that incorporates several different approaches
- The objective is to capture at least **85% of the CSO volume** in an average year
- The proposed plan includes:

<table>
<thead>
<tr>
<th>Storage</th>
<th>Conveyance</th>
<th>Treatment</th>
<th>Sewer Separation</th>
<th>Green Infrastructure</th>
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<tr>
<td>• Completion of City-approved projects that provide storage in tanks and pipes</td>
<td>• Sewer and pumping station upgrades to send more flow to the Treatment Plant</td>
<td>• Expand JMEUC Treatment Plant to treat more flow</td>
<td>• Separate existing sewer into two separate sewers (sanitary and storm) in two areas</td>
<td>• Pilot program starting with a few rain gardens around the City, add more if successful</td>
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Locations of Proposed CSO Control Improvements

- Reduce Flooding at Park Ave
- Sewer Separation
- Sewer and Related Upgrades
- Expand JMEUC Treatment Plant
- Sewer Separation
- Storage Tank at Trumbull Street
- Sewer Separation at South Street
- Storage Tank at Atlantic Street
- Upgrade Trenton Ave Pump Station
- Sewer System Improvements
- Sewer System Improvements
What Can You Do at Home to Reduce CSOs?

Some ideas to consider for your home are:

- **Rain barrels:** Can hold up to 50 gallons of stormwater runoff which would otherwise flow into the sewer. This water is not drinkable but can be used for watering or washing outdoors.
- **Rain garden:** A garden specially designed to absorb stormwater run-off from roads, parking lots, and sidewalks, instead of sending it to the sewer.
- **Porous pavement:** Permeable surface that allows stormwater to absorb back into the ground instead of running off into storm drains.
- **Downspout disconnection:** Reroute rooftop drains from sewers to rain barrel or to soak into the ground.
Discussion Questions:
(there are no wrong answers)

1. **What should be the primary consideration in selecting a CSO control solution?**

   A. Water quality improvements
   B. Cost
   C. Reduced flooding
   D. More green community spaces
Discussion Questions:

(there are no wrong answers)

2. What would be your preference in selecting locations for CSO control facilities?

   A. CSO controls that you can see (treatment plant, green infrastructure, etc.)

   B. CSO controls that are hidden (tunnel, underground storage tank, etc.)
Discussion Questions:
(there are no wrong answers)

3. What would be your preference in selecting locations for CSO control facilities?

A. Centralized solution – longer-term disruption to streets, but fewer locations around the City

B. Satellite sites – smaller, shorter-term disruption, but several locations around the City
Discussion Questions:

(there are no wrong answers)

4. What would be your greatest concern in selecting sites for CSO control facilities?

A. Size of required property / change in community
B. Acquiring private property / requiring residents to move
C. Traffic impacts
D. Odor / Environmental issues
E. Losing green space
Discussion Questions:
(there are no wrong answers)

5. What do you consider the primary benefit of green infrastructure?

A. Water quality improvements
B. Reduced flooding
C. Aesthetic, green community spaces
D. Job creation for green infrastructure operations and maintenance