

Separation vs. Storage

Dawn of CSO Abatement

June 2023

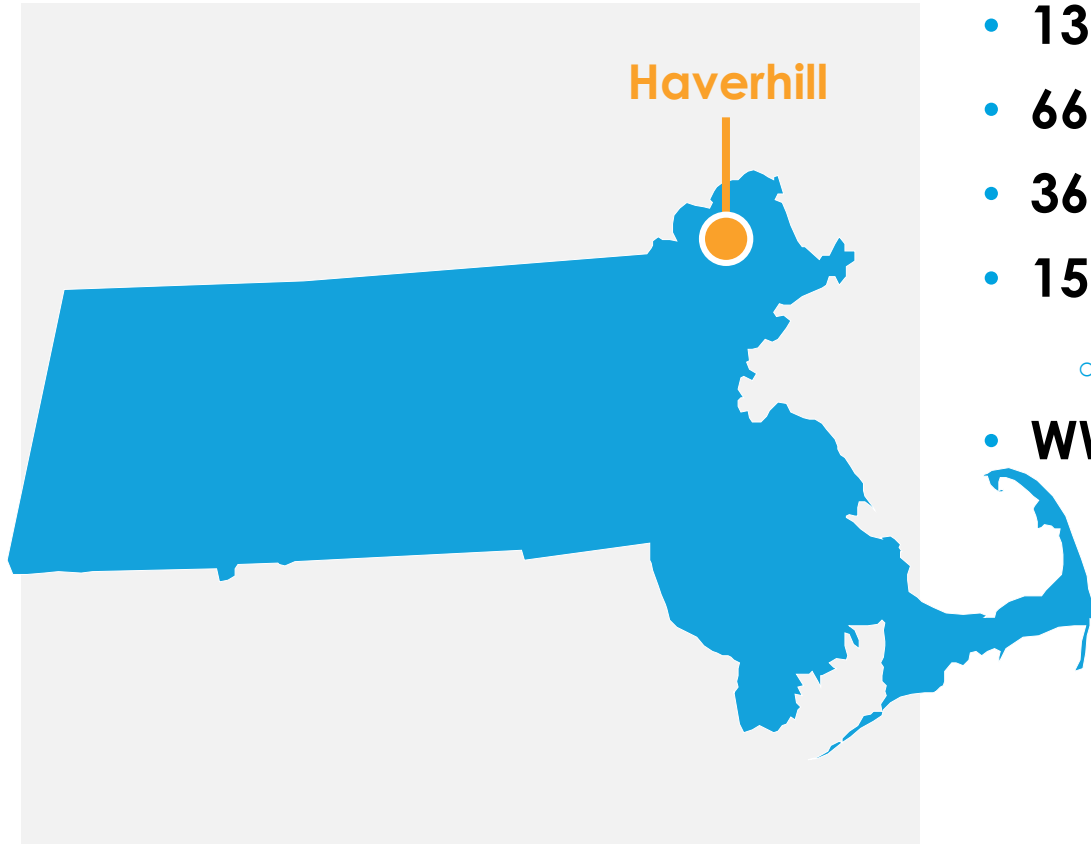
Jess Locke, EIT
Matthew Corbin, PE



Presentation Overview

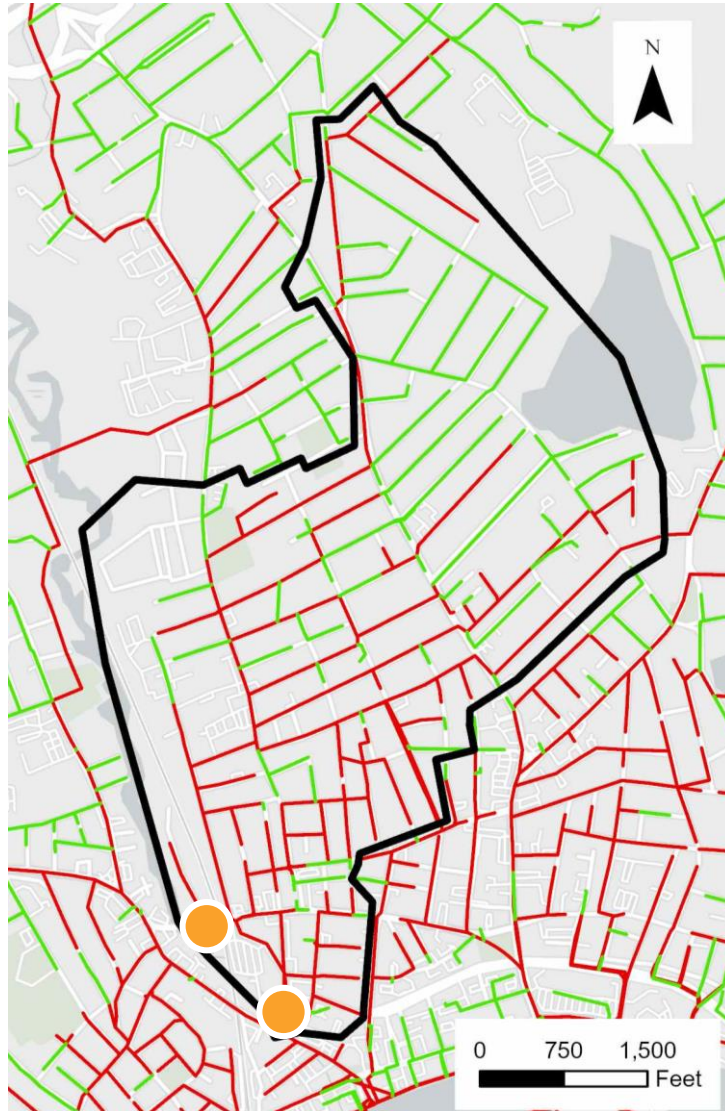
Project Background
Alternative Analysis
Recommendation
Next Steps
Thank You

Haverhill Sewer Collection System



- 134 miles of gravity sewers
- 66 miles of combined sewers
- 36 pump stations
- 15 active combined sewer regulators
 - 13 combined sewer outfalls
- WWTF – 10 MGD ADF

Locke Street Area Combined Sewer System



- **127,000 LF of combined sewers**
- **3 combined sewer regulators**
 - Winter Street
 - Winter and Hale
 - Center Barrel (Locke Street)
- **2 Combined Sewer Outfalls**
 - One for 2 CSO regulators on Winter Street
 - One for Center Barrell
- **Frequency of CSOs**
 - 77 in 2021
 - 57 in 2022

Consent Decree



- **Finalized in November 2016**
- **Between EPA, MassDEP, and City of Haverhill**
- **Requirements included**
 - **Start continuous monitoring of CSO outfalls**
 - **Submitting a Final CSO Long Term Control Plan Report**
 - **Feasibility study to evaluate Green Infrastructure types**
 - **Prevent CSO discharges during 3-month, 24-hour design storm**

Starting Off on the Right Foot

1

Understanding your community's combined sewer system

2

Being aware of what's downstream

3

Finding the right solution for your community

Question 1:

It is important to understand a community's system before making recommendations to address CSOs.

- A. True
- B. False

Question 1:

It is important to understand a community's system before making recommendations to address CSOs.

A. True

B. False

Field Investigations



- Flow monitoring
- CCTV pipe inspections



- Smoke testing
- Manhole inspections

Question 2:

Which field work should be performed to understand a municipality's sewer system?

- A. Flow monitoring**
- B. Manhole inspections**
- C. Smoke testing**
- D. All of the above**

Question 2:

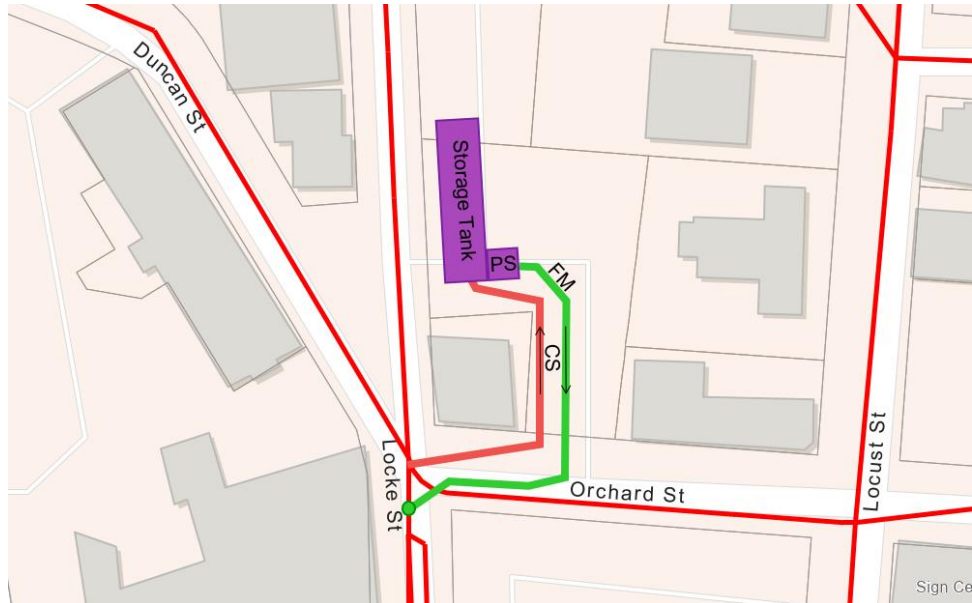
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Alternatives Analysis

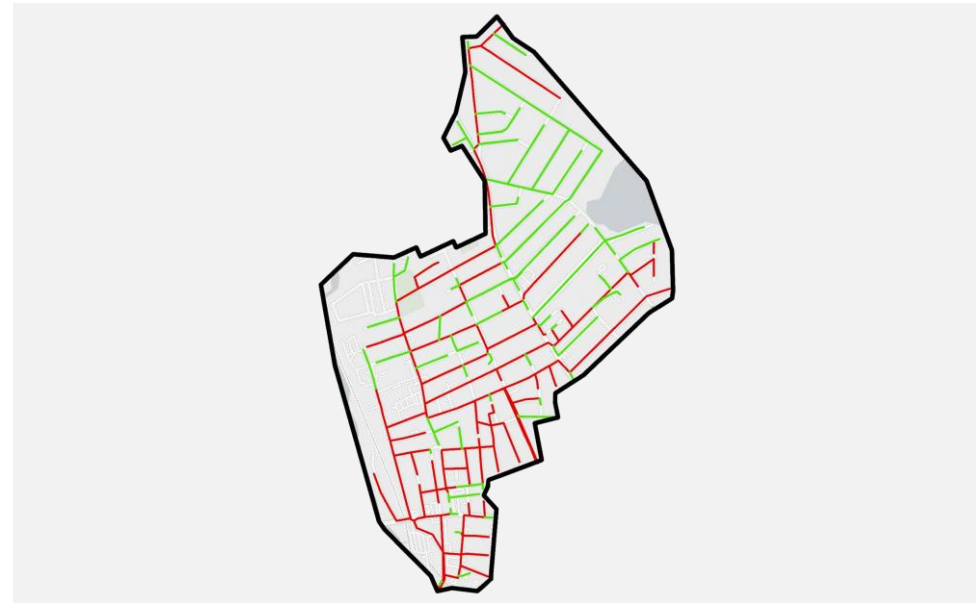
Storage

- 330,000-gal storage tank
- 24-inch diameter relief sewer



Separation

- Separating 32,000 ft of combined sewers
- Rehabilitating existing sewer system



Storage Considerations

Advantages

- Small construction area
- Little to no interference with other buried utilities
- Minimal modifications to existing sewer, storm drains, and outfalls

Disadvantages

- Routine maintenance
- Odor control
- Inflow is stored but not removed – still need to transport and treat
- Need to obtain space to construct storage tank

Separation Considerations

Advantages

- Permanently removes sources of public inflow
- Little operation and maintenance required
- Combined system can stay in service throughout construction

Disadvantages

- Large construction area
- Buried utility conflicts
- Sewer rehab needs
- Private inflow
- Stormwater capacity downstream

So, what is downstream?

Hale Street



Winter Street



Primrose Street



Additional Considerations for Sewer Separation

Railroad Crossing



Permitting Requirements



Question 3:

Which of the following should be considered when evaluating CSO abatement alternatives?

- A. Amount of inflow that needs to be removed/stored to reduce CSOs**
- B. Construction limitations and potential utility conflicts**
- C. Downstream impacts and potential permitting requirements**
- D. All of the above**

Question 3:

Which of the following should be considered when evaluating CSO abatement alternatives?

- A. Amount of inflow that needs to be removed/stored to reduce CSOs
- B. Construction limitations and potential utility conflicts
- C. Downstream impacts and potential permitting requirements
- D. All of the above**

Costs by Alternative

Alternative	Cost Estimate
Sewer Separation	\$21.7M
Sewer Separation + Infiltration Rehabilitation + Upsizing Storm Drains & Outfalls	\$40.9M
330,000 Gallon Storage Tank + 24-inch Relief Sewer	Capital Cost: \$18.9M 20-year lifecycle cost: \$20.0M

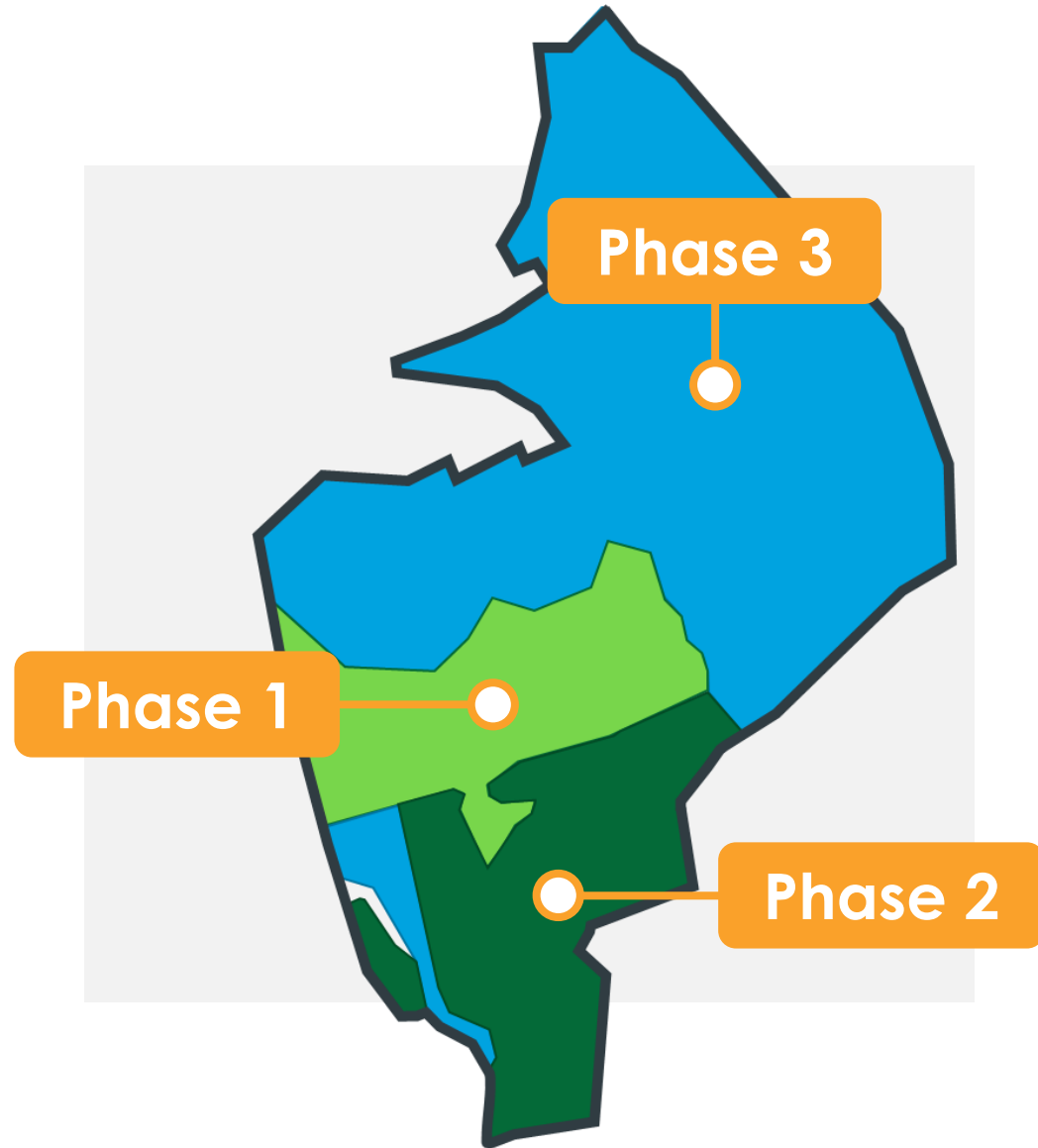
What is the best solution to meet Haverhill's needs?

Sewer Separation

with Infiltration Rehabilitation
and Upsizing Storm Drains & Outfalls

Next Steps

- Phasing
- Design
- Construction
- Post-construction flow metering



Where are we now?



Acknowledgements

City of Haverhill, MA

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Project Manager

Contact Information



Jess Locke, EIT

jess.locke@wright-pierce.com
978.416.8007



Matthew Corbin, PE

matthew.corbin@wright-pierce.com
978.416.8018

THANK YOU
