



Magazine Beach and Future Projects

Presentation to Cambridgeport Neighborhood Association

October 27, 2026

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Overview of City of Cambridge System

SEWER SYSTEM FACTS

115

miles
sanitary sewer

78

miles separate
storm drain

43

miles combined
sewer

7

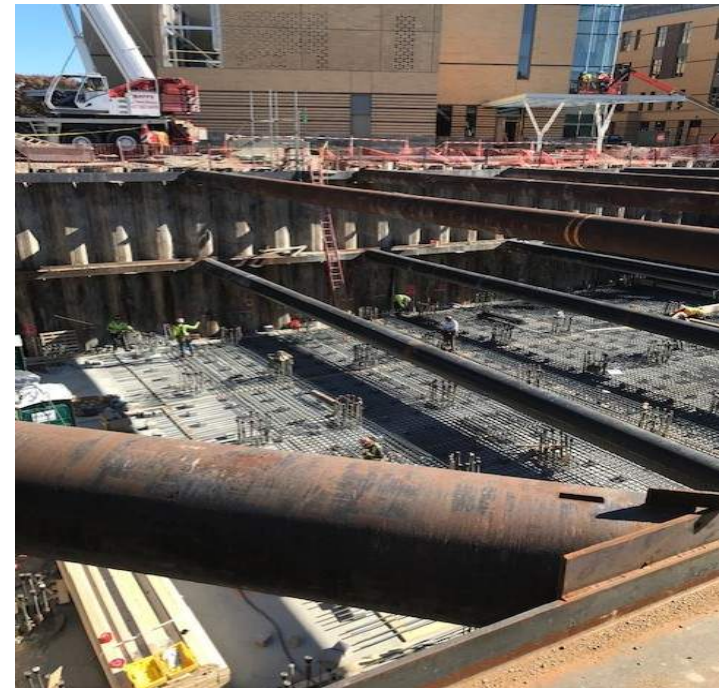
Combined Sewer
Overflows

4500

catch
basins

84

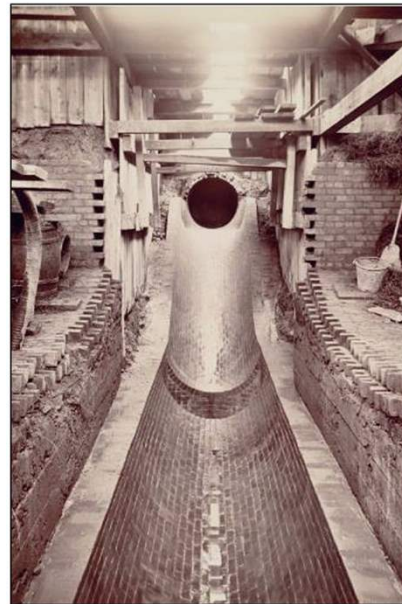
pumps (stations
and within
buildings)



Tobin School Stormwater Tank
Image Credit: City of Cambridge

Original Combined Sewer System

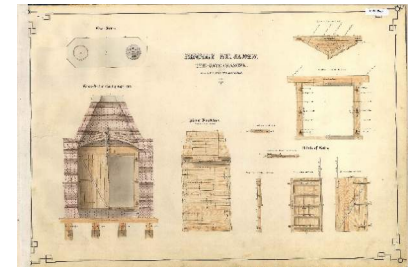
- City sewer system originally built as a **combined system** in late 19th century
- Sanitary waste from buildings and rainwater traveled through the same pipe and discharged untreated to the **Charles River and Alewife Brook**
- **Unique** pipe materials and configurations



Construction of Metropolitan Sewer District combined sewers. Image Credit: MWRA



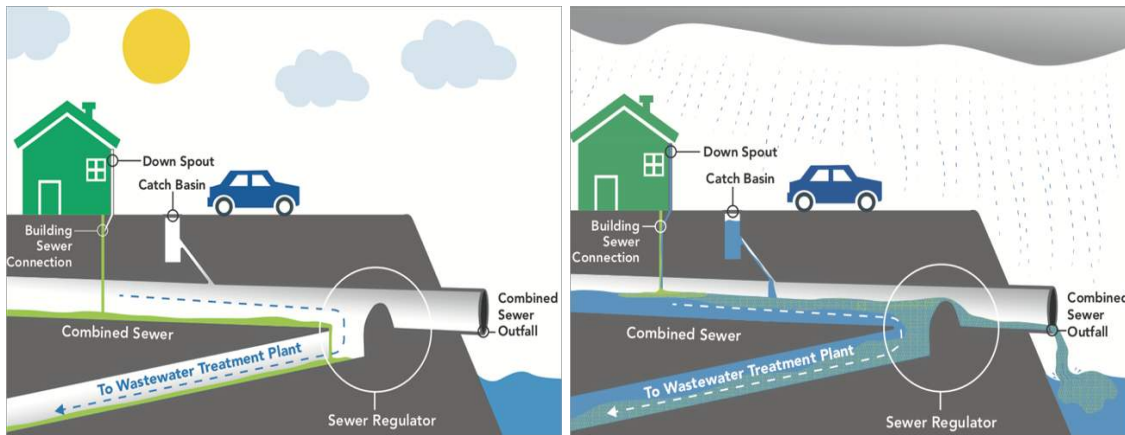
Norfolk Street (1867)
Image Credit: City of Cambridge



Binney Street (1876)
Image Credit: City of Cambridge

Sewage & Drainage Systems

Combined System

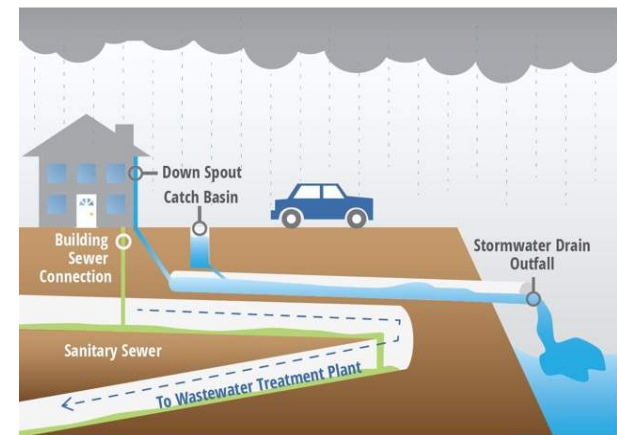


No or Moderate Rain

Heavy Rain

- Older, inner urban core, downstream
- Combined Sewer Overflows (CSO)

Separate System

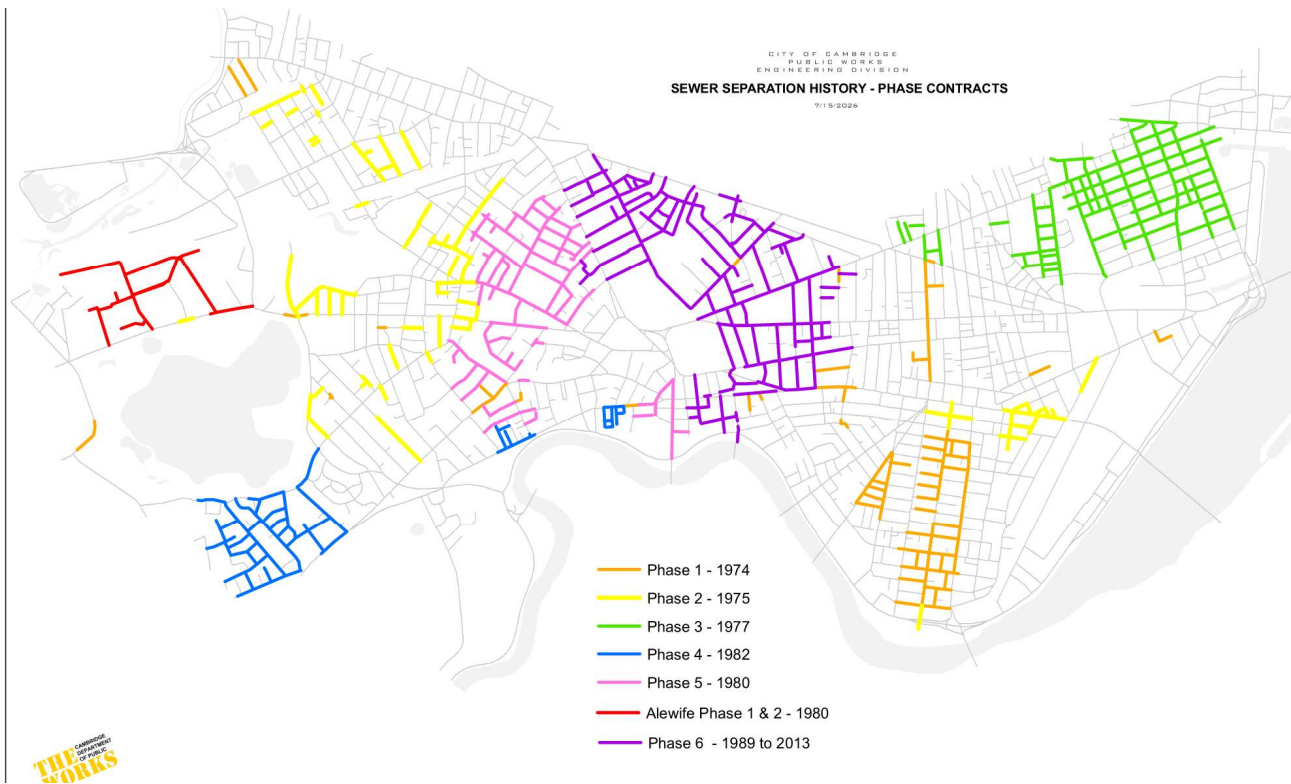


Any Rain

- Newer, upstream areas
- Stormwater "MS4"
- Inflow/Infiltration

Mapping & Program Establishment

- In the 1970s the whole sewer system was **mapped** for the first time
- The **Sewer & Drain Facilities Program** was also established during this time
- Work under this program first began in the **Pearl Street Area**
- Work continued across the City from **1970s-1990s**





Example Completed Projects

CAM004 Separation Program	CAM400 Project	Tobin School Project	Parking Lot 6 (PL6) Stormwater Storage Tank Project
Major construction on Alewife Brook Parkway, Alewife Wetland and Reconstruction of the entire Huron Ave neighborhood to eliminate CAM004 CSO.	Sewer separation in Whittemore Ave neighborhood to eliminate CAM400 CSO.	1.25 MG stormwater tank providing regional flood control.	400,000-gallon storage tank in PL6 Captured approx. 3.5 million gallons of stormwater in Summer 2021

Tobin School Project (2024)

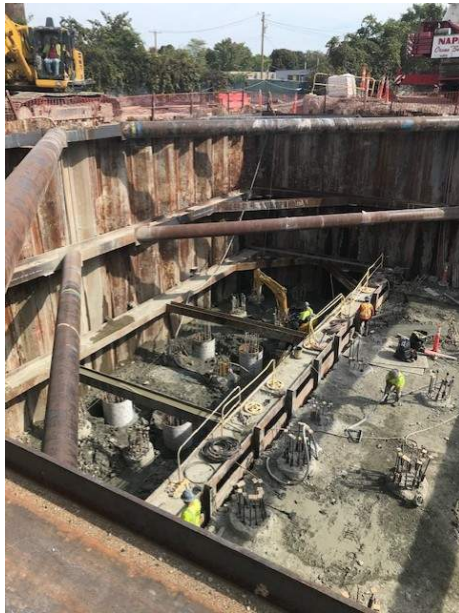


Image Credits: City of Cambridge



Project Partners



City of Somerville



City of Cambridge



**Massachusetts
Water Resources
Authority (MWRA)**



<https://voice.somervillema.gov/joint-cso-planning>

The Draft Plan at a Glance

- Accounts for increased precipitation due to climate change
- Eliminates CSOs in 2050 Typical Year
- Substantially reduces CSOs in larger storms
- Incorporates green stormwater infrastructure
- Recognizes impacts of potential projects, including affordability

Draft Updated Combined Sewer Overflow Control Plan for Alewife Brook, Upper Mystic River, and Charles River



Charles River



Alewife Brook



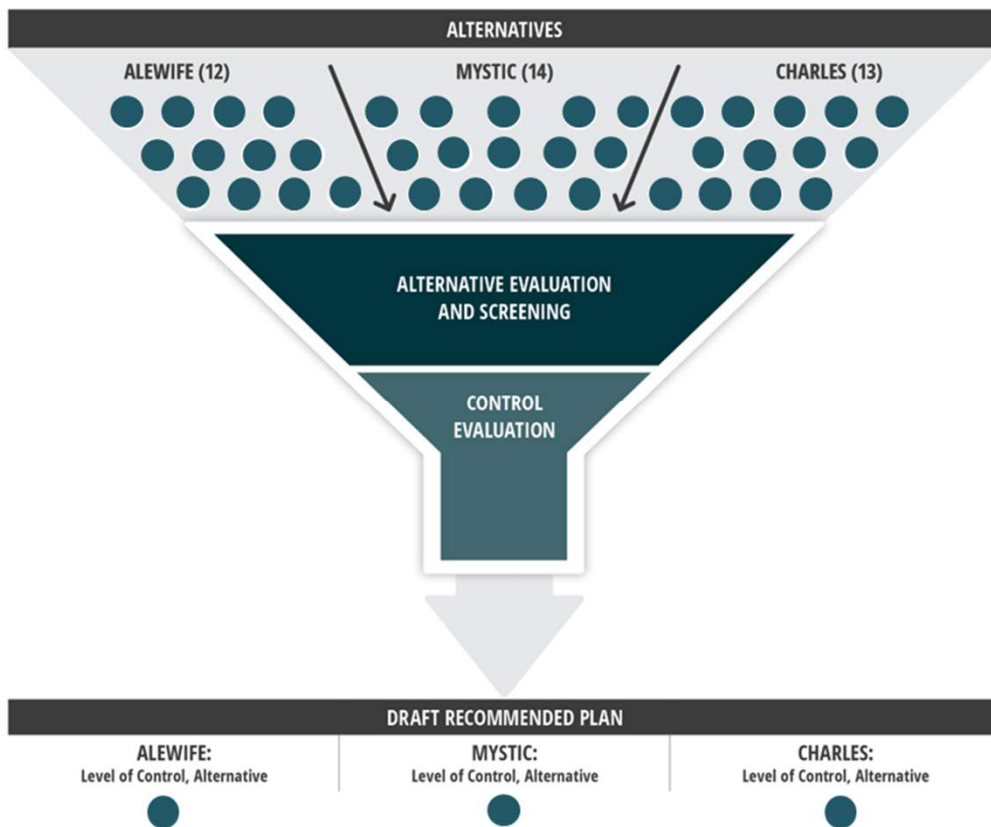
Upper Mystic River

Submitted by City of Cambridge, City of Somerville, and Massachusetts Water Resources Authority in accordance with the requirements of the 2024 Final Determinations to Adopt a Water Quality Standards Variance for Combined Sewer Overflow (CSO) Discharges to the Alewife Brook/Upper Mystic River Basin and to the Lower Charles River/Charles Basin

April 30, 2026



Alternatives Evaluation: Taking a Balanced Approach



- Benefits environmental and public health
- timeline to CSO reduction
- limiting neighborhood impacts
- land acquisition
- construction complexity
- protecting existing open space
- resulting water quality
- cost relative to water quality benefit
- affordability for the ratepayers

Charles River: Summary of Alternatives Included in Draft Plan

0 CSOs in 2050 Typical Year	Limited CSOs in 2050 Typical Year	0 CSOs in 2050 5-year Storm	0 CSOs in 2050 25-year Storm
1.CR Integrated 2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits \$1.1B, 13-18 years	8.CR Hybrid 1 1 tank (2.5 MG) + 268 acres of sewer separation + 1 storage conduit \$360M 23-28 years	10.CR Tunnel 4.5-mile-long deep tunnel (24 ft diameter) +1-mile-long Microtunnel \$1.9B, 15-20 years	12.CR Tunnel 4.5-mile-long deep tunnel (32 ft diameter)+ 1-mile-long Microtunnel + 1 storage conduit \$2.6B, 15-20 years
2.CR Hybrid 1 1 tank (2.5 MG) + 80 acres of sewer separation +2-mile-long deep tunnel (17 ft diameter) \$1.2B, 13-18 years			
3.CR Hybrid 2 2 tanks (12.7 MG) + 284 acres of sewer separation +0.75 mile-long Microtunnel + + 2 storage conduits \$750M, 23-28 years			
4.CR Hybrid 3 2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits \$690M, 28-33 years	9.CR Hybrid 2 1 tank (2.5 MG) + 80 acres of sewer separation + 0.75 mile-long Microtunnel + storage conduit \$300M, 8-13 years	11.CR Tunnel + GSI 10.CR + GSI (90 acres) \$2B, 15-20 years	13.CR Tunnel + GSI 12.CR + GSI (90 acres) \$2.7B, 15-20 years
5.CR Tunnel 4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits \$1.4B, 15-20 years			
6. CR Tunnel + GSI 5.CR + GSI (90 acres) \$1.5B, 15-20 years			
	7.CR Full Separation 4,400 acres \$4.5B, 50+ years		

Charles River: Summary of Alternatives Included in Draft Plan – 2050 Typical Year Level of Control

0 CSOs in 2050 Typical Year

1.CR Integrated

2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits **\$1.1B, 13-18 years**

2.CR Hybrid 1

1 tank (2.5 MG) + 80 acres of sewer separation + 2-mile-long deep tunnel (17 ft diameter) **\$1.2B, 13-18 years**

3.CR Hybrid 2

2 tanks (12.7 MG) + 284 acres of sewer separation + 0.75 mile-long Microtunnel + 2 storage conduits **\$750M, 23-28 years**

4.CR Hybrid 3

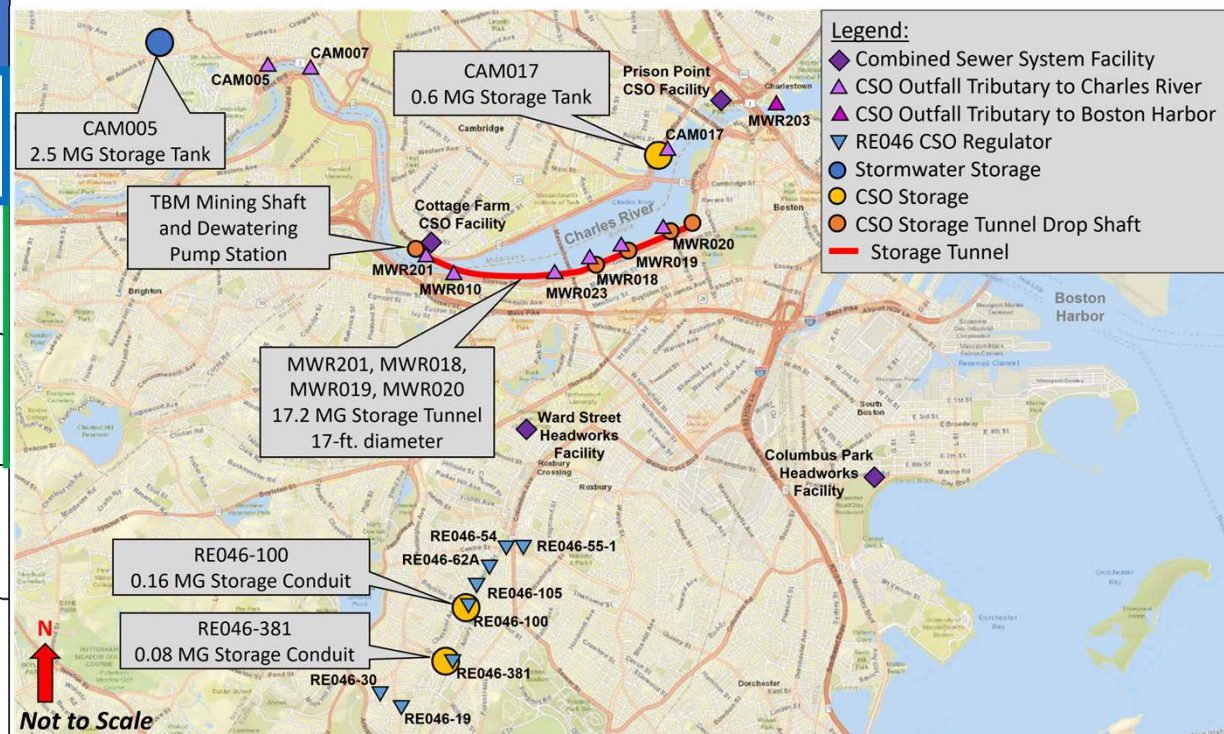
2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits **\$690M, 28-33 years**

5.CR Tunnel

4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits **\$1.4B, 15-20 years**

6. CR Tunnel + GSI

5.CR + GSI (90 acres) **\$1.5B, 15-20 years**



Charles River: Summary of Alternatives Included in Draft Plan – 2050 Typical Year Level of Control

0 CSOs in 2050 Typical Year

1.CR Integrated

2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits **\$1.1B, 13-18 years**

2.CR Hybrid 1

1 tank (2.5 MG) + 80 acres of sewer separation + 2-mile-long deep tunnel (17 ft diameter) **\$1.2B, 13-18 years**

3.CR Hybrid 2

2 tanks (12.7 MG) + 284 acres of sewer separation + 0.75 mile-long Microtunnel + 2 storage conduits **\$750M, 23-28 years**

4.CR Hybrid 3

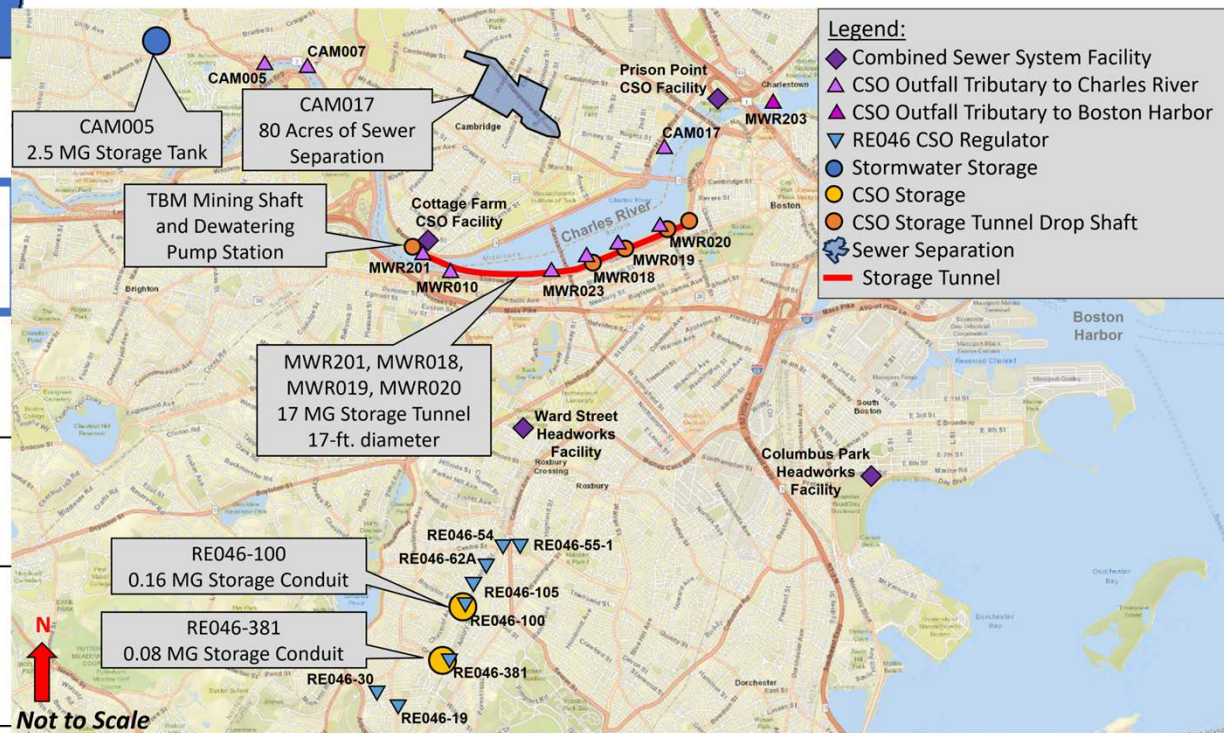
2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits **\$690M, 28-33 years**

5.CR Tunnel

4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits **\$1.4B, 15-20 years**

6. CR Tunnel + GSI

5.CR + GSI (90 acres) **\$1.5B, 15-20 years**



Charles River: Summary of Alternatives Included in Draft Plan – 2050 Typical Year Level of Control

0 CSOs in 2050 Typical Year

1.CR Integrated

2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits **\$1.1B, 13-18 years**

2.CR Hybrid 1

1 tank (2.5 MG) + 80 acres of sewer separation + 2-mile-long deep tunnel (17 ft diameter) **\$1.2B, 13-18 years**

3.CR Hybrid 2

2 tanks (12.7 MG) + 284 acres of sewer separation + 0.75 mile-long Microtunnel + 2 storage conduits **\$750M, 23-28 years**

4.CR Hybrid 3

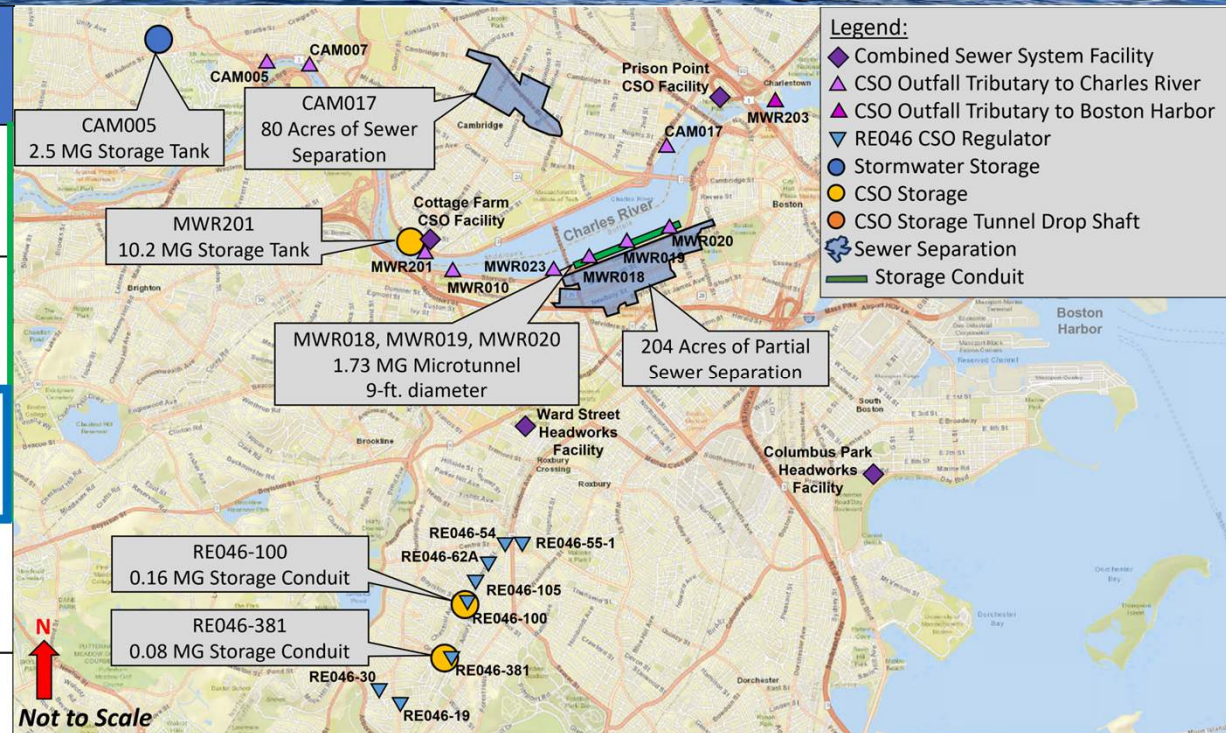
2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits **\$690M, 28-33 years**

5.CR Tunnel

4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits **\$1.4B, 15-20 years**

6. CR Tunnel + GSI

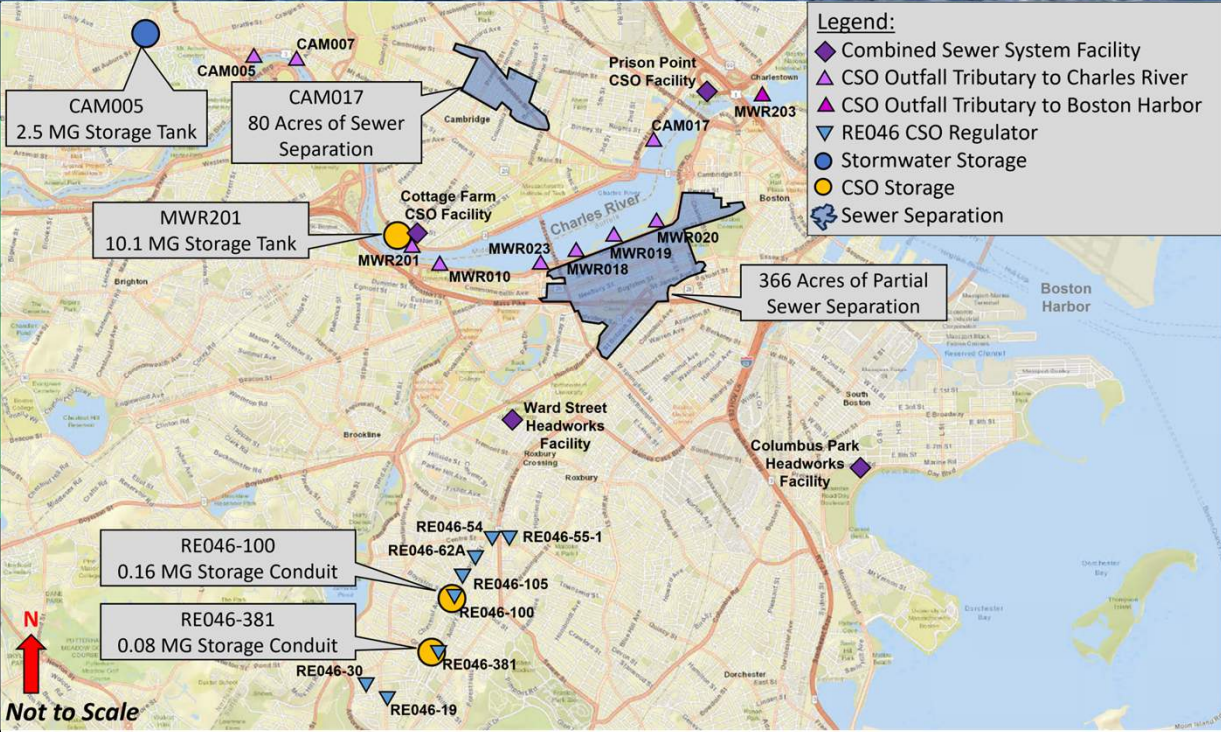
5.CR + GSI (90 acres) **\$1.5B, 15-20 years**



Charles River: Summary of Alternatives Included in Draft Plan – 2050 Typical Year Level of Control

0 CSOs in 2050 Typical Year

- 1.CR Integrated**
2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits **\$1.1B, 13-18 years**
- 2.CR Hybrid 1**
1 tank (2.5 MG) + 80 acres of sewer separation +2-mile-long deep tunnel (17 ft diameter) **\$1.2B, 13-18 years**
- 3.CR Hybrid 2**
2 tanks (12.7 MG) + 284 acres of sewer separation +0.75 mile-long Microtunnel + + 2 storage conduits **\$750M, 23-28 years**
- 4.CR Hybrid 3**
2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits **\$690M, 28-33 years**
- 5.CR Tunnel**
4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits **\$1.4B, 15-20 years**
- 6. CR Tunnel + GSI**
5.CR + GSI (90 acres) **\$1.5B, 15-20 years**



Charles River: Summary of Alternatives Included in Draft Plan – 2050 Typical Year Level of Control

0 CSOs in 2050 Typical Year

1.CR Integrated

2 tanks (3.1 MG) + 2-mile-long deep tunnel (17 ft diameter) + 2 storage conduits **\$1.1B, 13-18 years**

2.CR Hybrid 1

1 tank (2.5 MG) + 80 acres of sewer separation + 2-mile-long deep tunnel (17 ft diameter) **\$1.2B, 13-18 years**

3.CR Hybrid 2

2 tanks (12.7 MG) + 284 acres of sewer separation + 0.75 mile-long Microtunnel + 2 storage conduits **\$750M, 23-28 years**

4.CR Hybrid 3

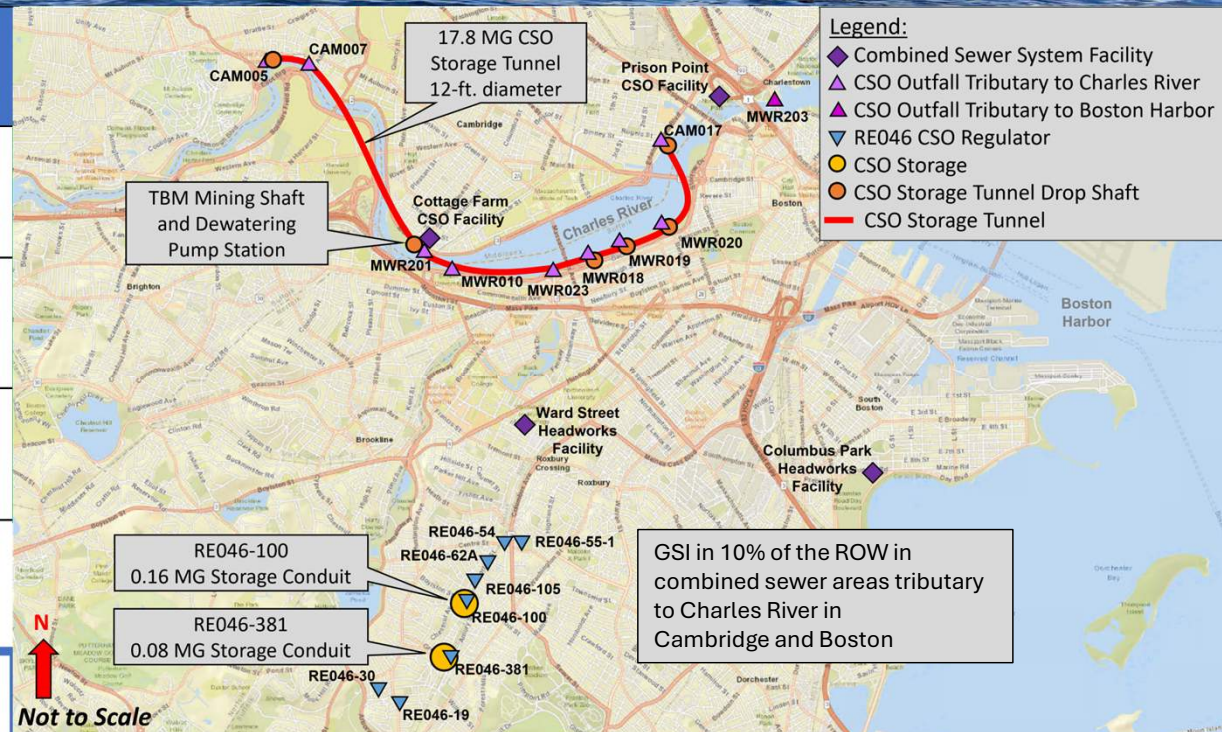
2 tanks (12.6 MG) + 446 acres of sewer separation + 2 storage conduits **\$690M, 28-33 years**

5.CR Tunnel

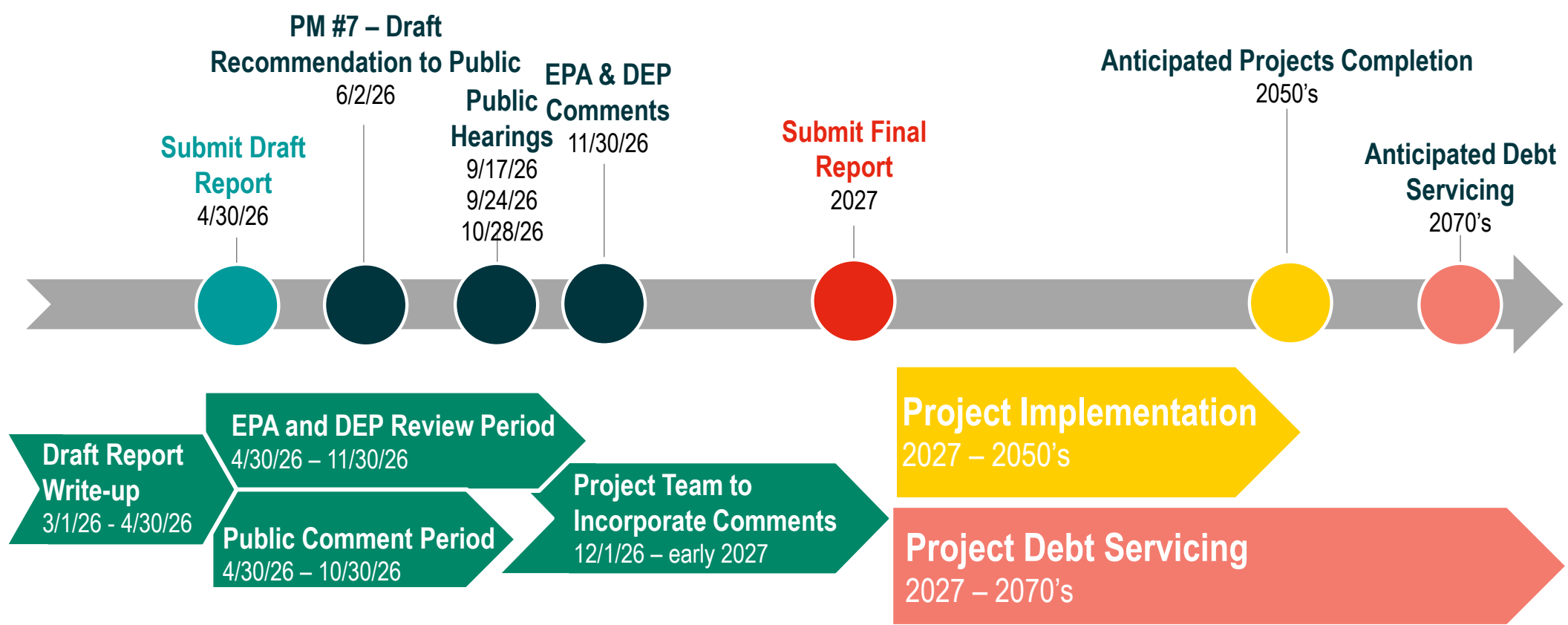
4.5-mile-deep tunnel (12 ft diameter) + 2 storage conduits **\$1.4B, 15-20 years**

6. CR Tunnel + GSI

5.CR + GSI (90 acres) **\$1.5B, 15-20 years**



Timeline of the Updated CSO Control Plan



Where can I comment in writing on the Draft Plan?

**Public comments
accepted
April 30, 2026 -
October 30, 2026**

Submit Comments in the Online Portal:

Comments can be submitted to the project team electronically using our online portal:

<https://us.planengage.com/updatedcsocontrolplan/page/home>



Submit Comments by Email:

Comments can be emailed to the project team:

UpdatedCSOControlPlan@aecom.com



Submit Comments by Mail:

Electronic comments are preferred, however written comments addressed to "Draft Updated CSO Control Plan Partners" can be mailed to the following address:

**MWRA
Attn: Draft Updated CSO Control Plan
2 Griffin Way
Chelsea, MA 02150**

There are Multiple Sources of Pollution

Pollutants affect water quality, environmental health, and public health.
CSOs are one source of those pollutants.

Dry weather (perpetual)	Stormwater (every time it rains)	CSOs (large, intense storms)
<ul style="list-style-type: none">• Illicit sewer connections• Leaky sewer pipes• Wildlife and dog excrement• Decomposing leaves	<ul style="list-style-type: none">• Pathogens (bacteria, viruses)• Oil and grease• Nutrients (Phosphorus, Nitrogen)• Trash• Others	<ul style="list-style-type: none">• Pathogens (bacteria, viruses)• Oil and grease• Trash• Nutrients (Phosphorus, Nitrogen)• Pharmaceuticals• Industrial waste• Others

Data shows **eliminating CSO would not** make waterbodies fully swimmable or fishable.

Treated vs Untreated Discharges to the Charles

- The Cottage Farm facility discharges the highest volume of any outfall to the Charles but only does so in very large storms
- The flow, which is predominantly stormwater, is screened, disinfected with chlorine, and then dechlorinated before entering the Charles River
- This treatment ensures that discharges from Cottage Farm are not a barrier to safe recreation. The *E. coli* swim standard set by DEP is 410 #/100 mL

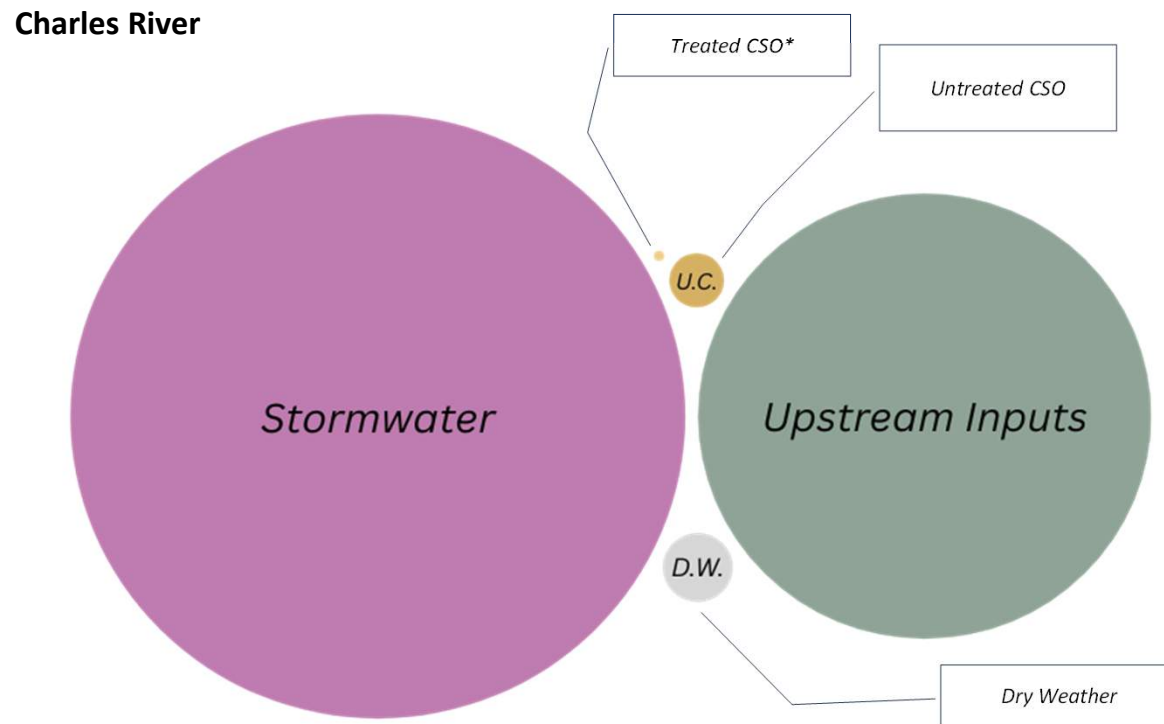
Charles River CSO Outfalls (West to East) –
From Table 6-8 in the Draft Plan

Outfall	Type	Flow-weighted Sanitary Fraction	<i>E. coli</i> Concentration (#/100 mL)
CAM005	Untreated	<0.01%	22,655
CAM007	Untreated	N/A*	N/A*
Cottage Farm (MWR201)	Treated	--	394
MWR010	Untreated	N/A*	N/A*
MWR023	Untreated	<0.01%	20,056
MWR018	Untreated	0.7%	42,378
MWR019	Untreated	1.1%	95,674
MWR020	Untreated	0.2%	26,854
CAM017	Untreated	4.4%	306,118

- * N/A signifies outfall does not discharge in the 2050 Typical Year
- -- Concentration at Cottage Farm based on facility data in 2018-2019

All sources of *E. coli* pollution to the Charles

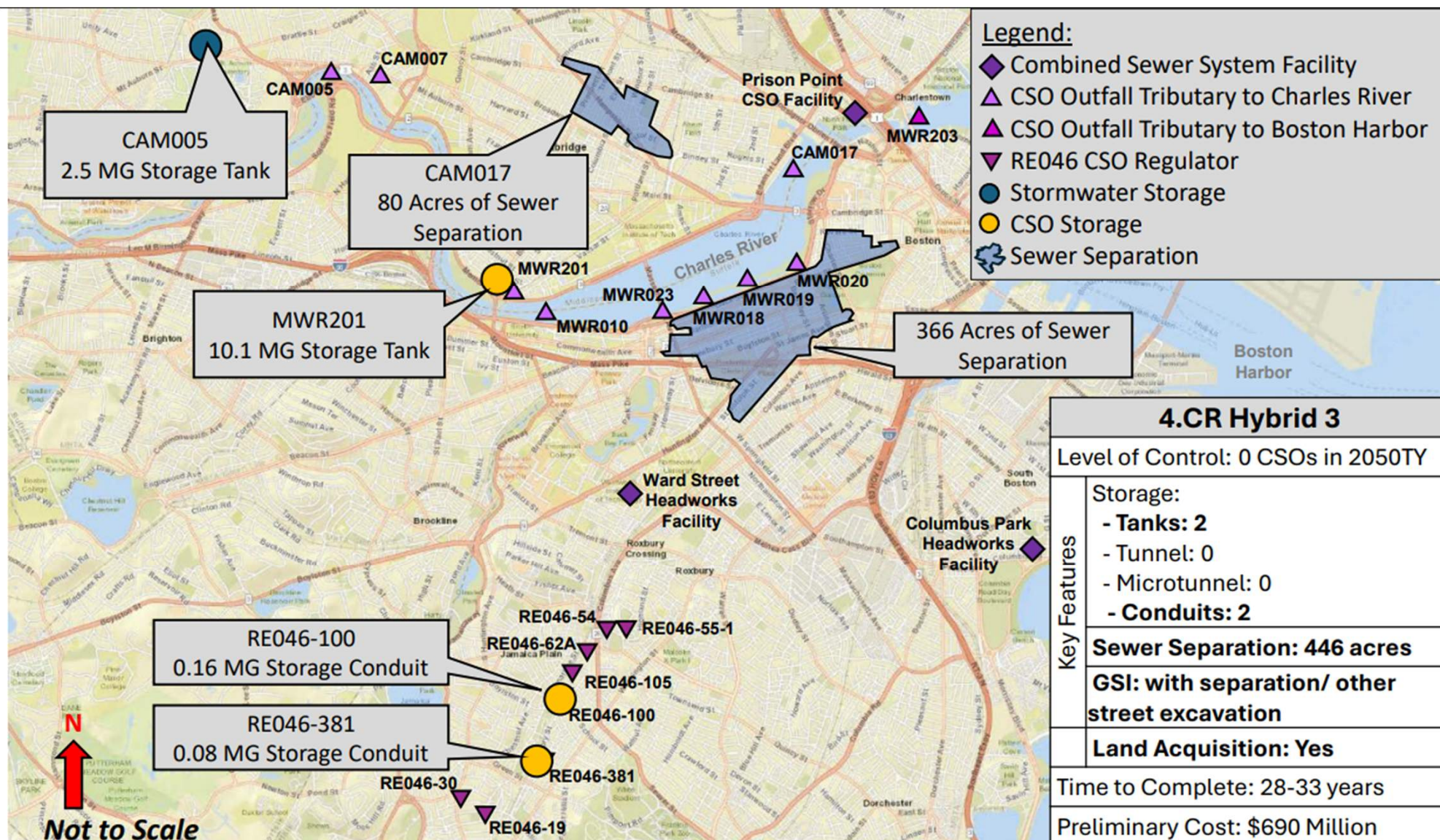
Relative annual proportions of *E. coli* by source



* Treated CSO is disinfected before discharge

Charles River Draft Recommend Alternative





Summary of Draft Recommendations

Receiving Waterbody	Alternative Name	Level of Control	Cost	Duration
Alewife Brook	3.AB Hybrid 2	0 CSOs in 2050 TY	\$340M	13-18 years
Upper Mystic	2.MR Hybrid 1	0 CSOs in 2050 TY	\$260M	5-7 years
Charles River	4.CR Hybrid 3	0 CSOs in 2050 TY	\$690M	28-33 years
Total Cost			\$1.29B	

Charles River – Magazine Beach

- Property Ownership - DCR
- Access to site from Memorial Drive
- Haul route - Memorial Dr to/from I-90
- Tree removal within limits of laydown area
- Article 97 / Legislation required



Charles River – Potential Projects at Magazine Beach

0 CSOs 2050TY

4.CR Hybrid 3

- 10.2MG CSO Storage Tank
- 300 ft x 150 ft
- ~70 ft deep excavation
- At-Grade Dewatering Pump Station & Odor Control Facility (over tank)



Limited CSOs 2050TY

8.CR Hybrid 1

- No new work



5YR Storm 2050TY

11.CR Tunnel + GSI

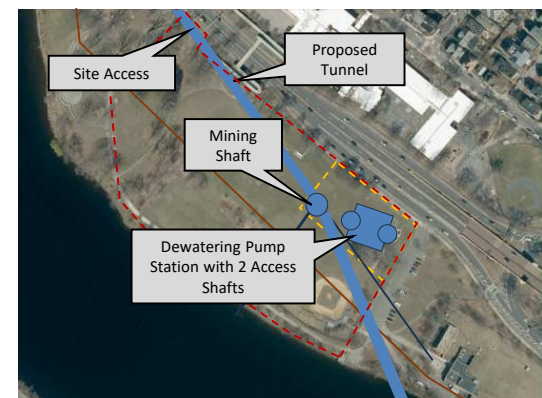
- 71.4MG CSO Storage Tunnel
- 24 ft diam., ~300 ft deep
- 23,700 ft long (2 segments)
- 50 ft dia. Mining Shaft
- Perm. Dewatering Pump Station w/ 2 Access Shafts (50 ft dia.)



25YR Storm 2050TY

13.CR Tunnel + GSI

- 131.4MG CSO Storage Tunnel
- 32 ft diam., ~350 ft deep
- 23,700 ft long (2 segments)
- 60 ft dia. Mining Shaft
- Perm. Dewatering Pump Station w/ 2 Access Shafts (50 ft dia.)



Charles River – Potential Projects at Magazine Beach

0 CSOs 2050TY

4.CR Hybrid 3

- Construction duration of ~6 years
- Typical work hours
- ~125,000 cy of material
- Avg. of ~35 trucks per day during tank excavation
- Temporary construction easement ~8.2 acres
- Permanent footprint ~2.3 acres



Limited CSOs 2050TY

- **8.CR Hybrid 1**
- No new work



5YR Storm 2050TY

11.CR Tunnel + GSI

- Construction duration of ~8 years
- Construction operations 24/7
- Blasting
- Avg. of 150 trucks per day for ~24 months
- Temporary construction easement ~8.2 acres
- Permanent footprint ~1.0 acre

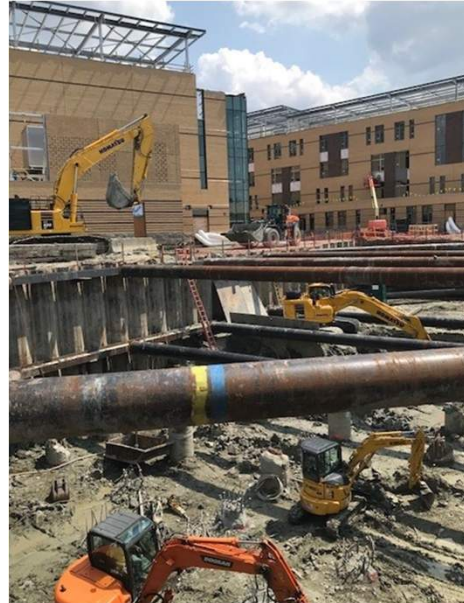
25YR Storm 2050TY

13.CR Tunnel + GSI

- Construction duration of ~8+ years
- Construction operations 24/7
- Blasting
- Avg. of 250 trucks per day for ~24 months
- Temporary construction easement ~8.2 acres
- Permanent footprint ~1.0 acre



Construction Aspect – Large Storage Tanks



- Constructed below grade
- Primarily confined to site limits
- Multiyear projects
- Mostly daytime work hours

Construction Aspect – Regional Tunnels



- Large storage volumes
- Specialized construction methods
- Requires large construction staging areas
- Multiyear projects
- 24/7 work hours during tunnel mining
- **Very large** volume of material would be excavated and trucked off site

Construction Aspect – Construction Shafts



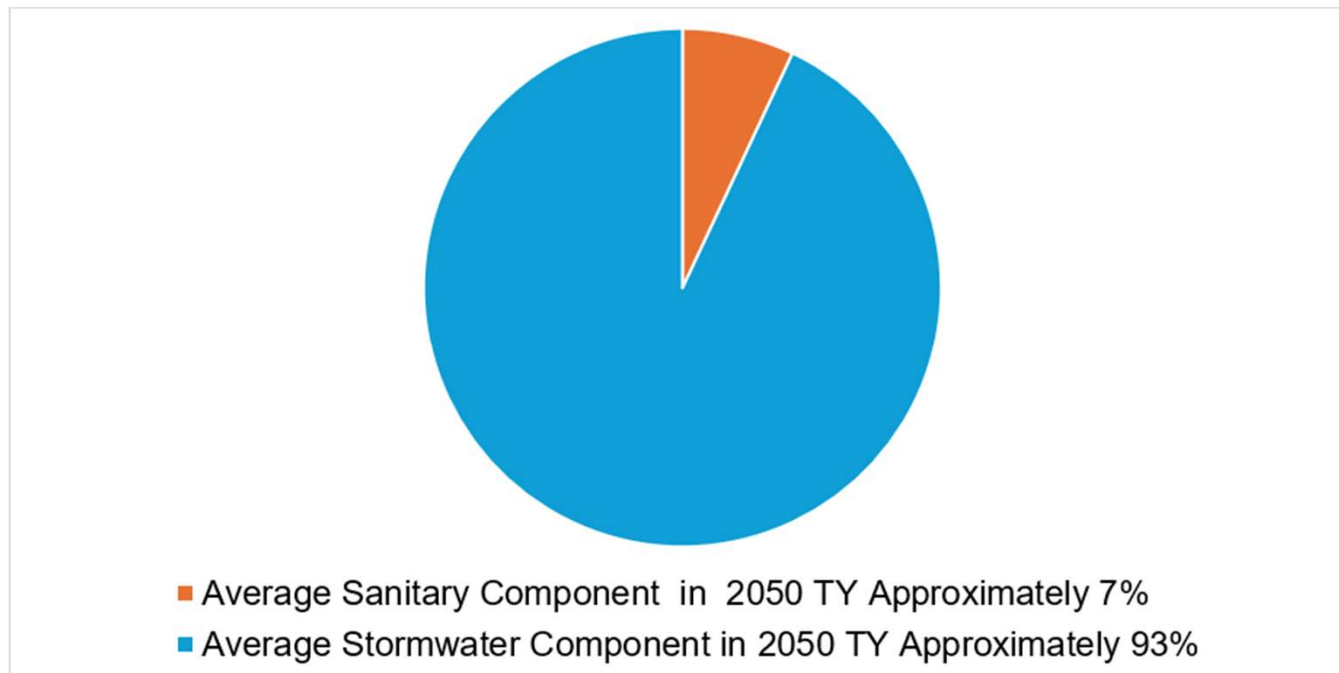
- Needed for regional tunnel options
- Very deep and large diameter
- Located at each end of the regional tunnel alignment
- Blasting required

Average Sanitary and Stormwater Components

MWR201 (Cottage Farm CSO Facility)

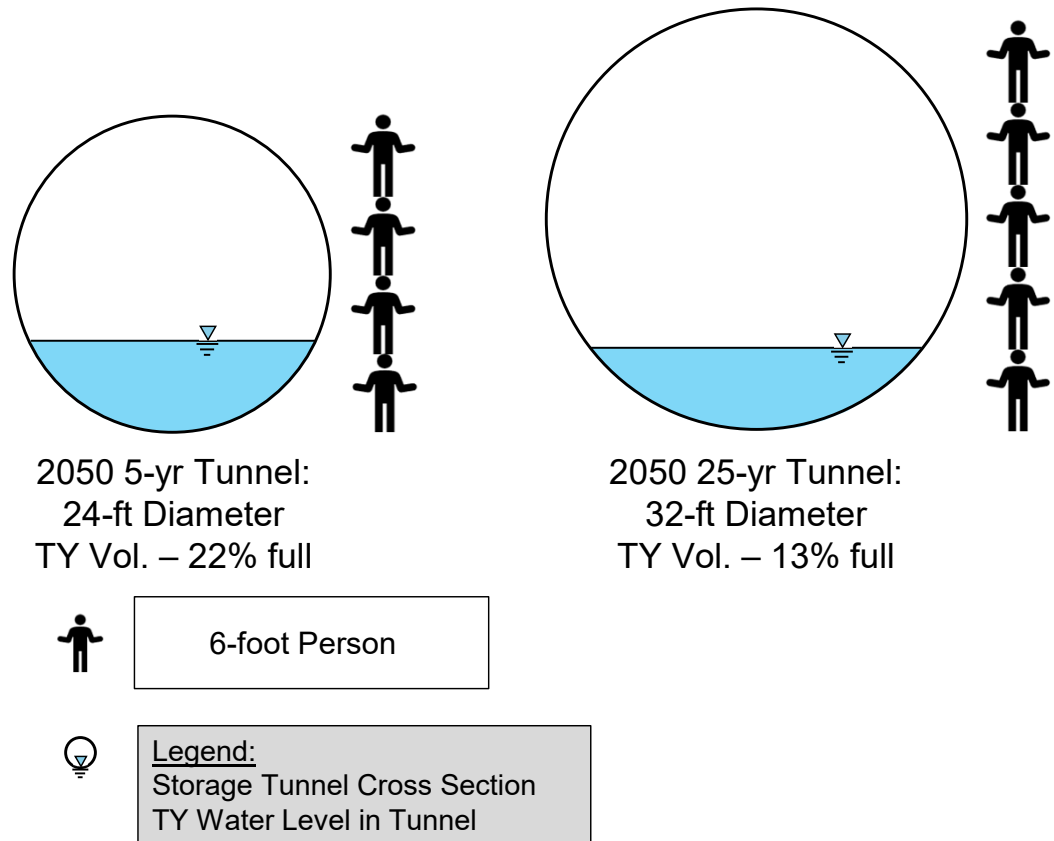
10.1 MG Storage Tank (0 CSOs in the 2050 TY)

Average Sanitary and Stormwater Components over the 2050 TY



Charles River CSO Storage Tunnel – TY Vol.

- The tunnel cross sections represent two CSO storage tunnels sized to store the largest CSO discharge in the 2050 5-yr, and 2050 25-yr storms.
- The cross sections depict the approximate water level and percentage of the tunnel that would be utilized during the largest CSO discharge in the 2050 TY (17.8 MG)



Other Projects at Magazine Beach



MWRA Cottage
Farm CSO
Facility

LIMITS OF WORK

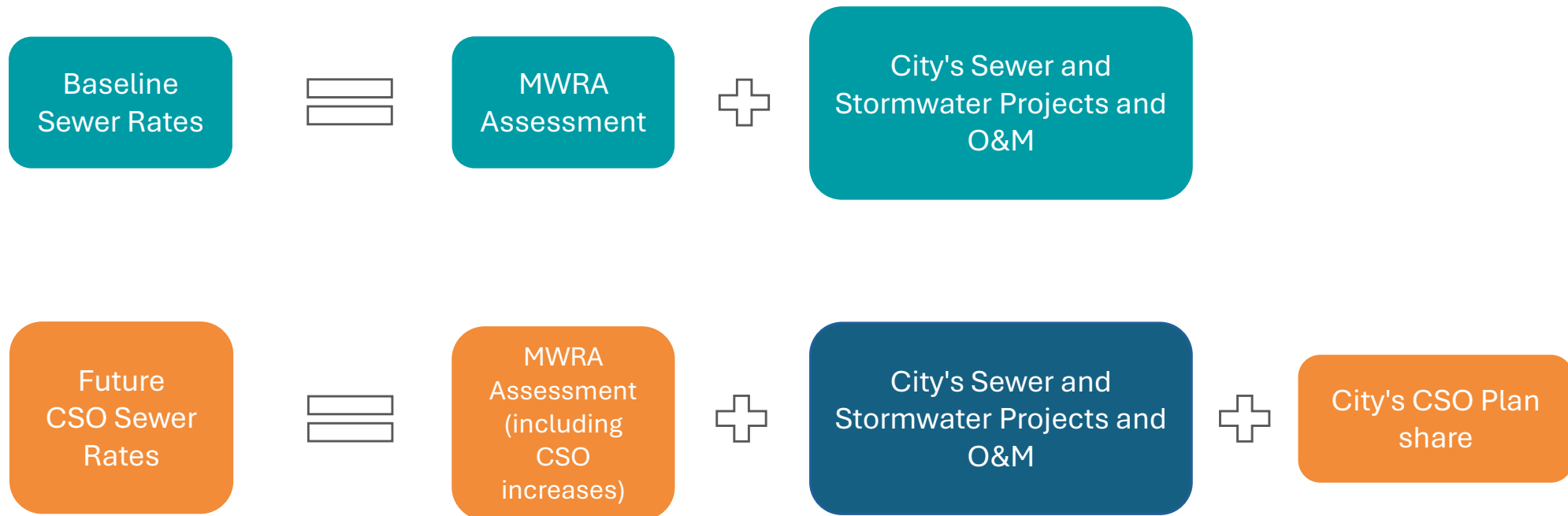
Approximate Limits of Work for PCB Remediation Project

- By MWRA @ Cottage Farm CSO Facility:
 - Chemical Tank Replacement, 2026
 - PCB Remediation at Cottage Farm, 2026-2028
- By Eversource:
 - Greater Cambridge Energy Project
 - Horizontal Direction Drilling

Financial Considerations for Cambridge



Sewer Rate Impacts for Cambridge



Financial Impacts – City of Cambridge

Rate increases will be significant year over year.

The Draft Recommended Plan:

- Achieves the highest level of CSO control that does not go into double digit rate increases.
- Balances level of CSO control with more manageable rate increases than higher levels of CSO control.

	Baseline	Limited 2050 TY	(recommended) 2050 TY	2050 5-YR	2050 25-YR	Full Sewer Separation
FY 2027	7.50%	9.00%	9.00%	15.00%	20.00%	16.00%
FY 2028	7.50%	9.00%	9.00%	15.00%	20.00%	16.00%
FY 2029	7.50%	9.00%	9.00%	15.00%	20.00%	16.00%
FY 2030	3.00%	4.00%	4.00%	15.00%	20.00%	15.00%
FY 2031	3.00%	4.00%	4.00%	15.00%	15.00%	10.00%
FY 2032	3.00%	4.00%	4.00%	8.00%	15.00%	10.00%
FY 2033	3.00%	4.00%	3.00%	8.00%	10.00%	10.00%
FY 2034	3.00%	3.00%	3.00%	6.00%	10.00%	5.00%
FY 2035	3.00%	3.00%	3.00%	2.00%	2.00%	5.00%
FY 2036	3.00%	3.00%	3.00%	2.00%	2.00%	3.00%
FY 2037	3.00%	3.00%	3.00%	2.00%	2.00%	3.00%
FY 2038	3.00%	3.00%	3.00%	2.00%	2.00%	2.00%
FY 2039	3.00%	3.00%	3.00%	2.00%	2.00%	2.00%
FY 2040	3.00%	3.00%	3.00%	2.00%	2.00%	2.00%
FY 2041	3.00%	3.00%	3.00%	2.00%	2.00%	2.00%
FY 2042	3.00%	2.00%	3.00%	2.00%	2.00%	2.00%
FY 2043	3.00%	2.00%	3.00%	2.00%	2.00%	2.00%
FY 2044	3.00%	2.00%	3.00%	2.00%	2.00%	2.00%
FY 2045	3.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2046	3.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2047	3.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2048	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2049	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2050	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2051	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2052	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2053	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2054	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2055	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
FY 2056	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

Projected Cambridge Rate Increases

Financial Impacts – City of Cambridge Ratepayers

City of Cambridge ratepayers will see a **larger annual sewer bill by 2056** with the recommended alternative than already planned, but not nearly what is projected for alternatives with greater CSO control.

Alternative	Current FY 2026 Annual Bill *	Projected FY 2056 Annual Bill*	Percent Change
Baseline	\$1,233	\$3,173	+157%
2050 TY (recommended)	\$1,233	\$3,341	+171%
2050 5-YR	\$1,233	\$5,308	+330%
2050 25-YR	\$1,233	\$7,686	+523%
Full Sewer Separation	\$1,233	\$5,381	+372%

* average single family residential household bill

Financial Impacts – City of Cambridge Ratepayers

More Cambridge households will have high unaffordable sewer bills.

Alternative	Percent of households with unaffordable* sewer bills by 2045
Baseline	23.3%
2050 TY (recommended)	24.8%
2050 5-YR	34.2%
2050 25-YR	46.2%
Full Sewer Separation	38.5%

* sewer bill more than 2% of the median household income. Today 17.9% of households in Cambridge fall into this category.

CSO Project Info & Contacts

For additional information on the project, see the project website:
<https://voice.somervillema.gov/joint-cso-planning>

Or contact

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