



Minutes

Oct.4 , 2024

Remote

**Attendees:**

**WAC Members:** Kannan Vembu (Chair), Dan Winograd (Vice Chair), **Adriana Cillo** (BWSC), **Craig Allen**, **Wayne Chouinard** (Belmont), George Atallah, **Dr. Karen Lachmayr**, **Martin Pillsbury** (MAPC), **Stephen Greene**, **Taber Keally** (NepRWA), **Alfredo Vargas** (Newton), **Jim Ferrara**, **Christine Bennett** (Advisory Board). (Members in attendance in **bold**).

**Guests:** Wendy Leo, Ester Lwebuga, Brian Kubaska, Margery Johnson, Maret Smolow, Devon Winkler, Daniel Antoine, Katie Ronan (MWRA), Erika Casarano (AECOM), Moussa Siri, Paul Lauenstein (WSCAC). Max Rome (CRWA), Stephen Perkins (MyRWA), Eugene Benson, Gwen Speeth, David Stoff, David White, Kristin Anderson (Save the Alewife), Ann McDonald

**Staff:** Andreae Downs

**MWRA Update—Wendy Leo:**

- No final permit for Deer Island yet.
- New MWRA website—hadn't been updated in 25-30 years.
- Recent publications: Annual [inflow/infiltration](#) and [demand management](#) (drinking water—links included in title). Due out shortly: Annual Industrial Waste, Operations for DI & Collection system
- Rehab at Braintree Weymouth ongoing. Big project to rehab the clarifiers ongoing (5-years, \$100s of millions)

**Advisory Board—Christine Bennett**

- [ABTV](#)—podcast with video, social media & Substack—deeper dives into complex wastewater and water utility issues.

### **WSCAC Update—Moussa Siri:**

- Invite to join forestry tour in-person at the Quabbin Oct. 8 at 10 am.
- Nov. 12 in-person meeting at Southboro with perhaps a tour of the Carroll treatment plant in Marlborough

**CHAIRS REPORT—Kannan Vembu**—at the Advisory Board tour in August, he, Moussa, and others started thinking it would be a good idea for WAC and WSCAC members to meet each other in person if possible. Encouraged WAC members who can to attend the WSCAC forestry tour. WAC this year will have a climate change meeting Nov. 1 and a tour in May. We are also looking at a possible joint meeting time.

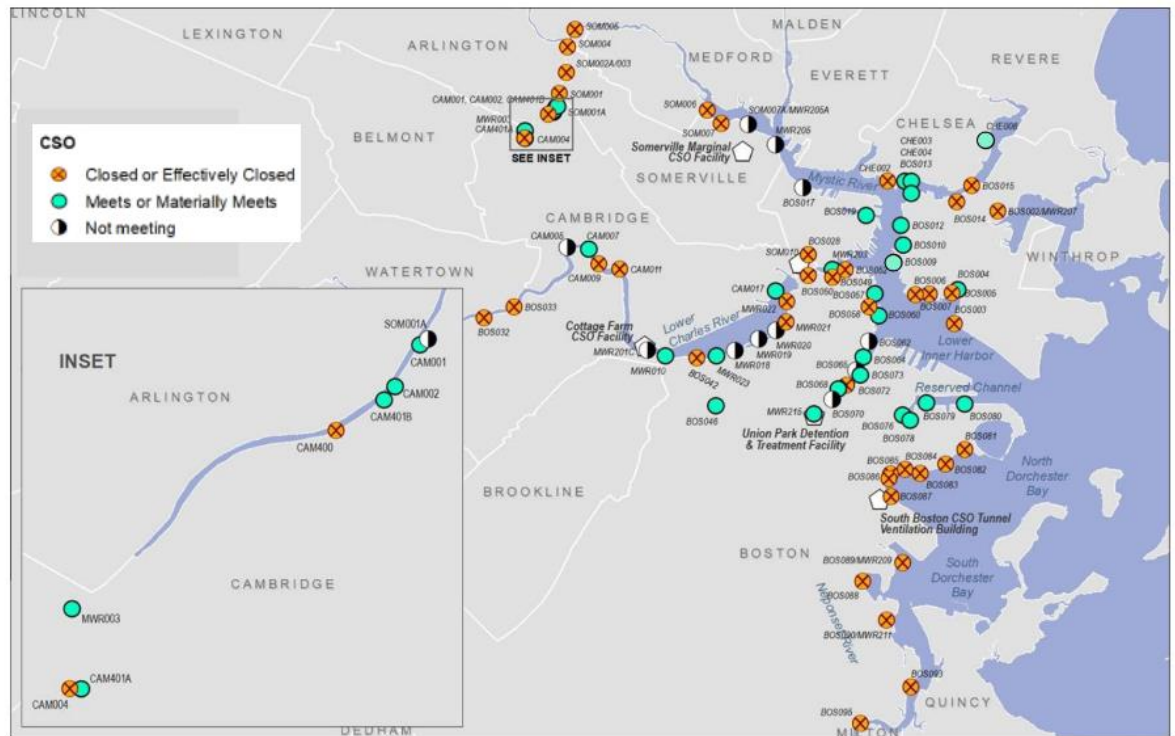
**DIRECTOR'S REPORT—Andreae Downs:** WAC's schedule is now online [here](#). Mostly covered in writing to the WAC. Andreae attended a webinar by Save the Harbor/Bay on beach preservation in light of sea level rise. Also a webinar on sludge incineration, of which the most important takeaway is that PFAS destruction cannot be guaranteed by normal incineration techniques.

### **PRESENTATION—Combined Sewer system Update**

Ester Lwebuga: **Progress in reducing volume of combined sewage, number of activations and number of outfalls since 1988**

- 397 MG per year (7 MG less than LCTP goal of 404 MG) – 88% reduction from 1988.
- 41 of 86 CSO outfalls closed / effectively closed
- 73 of 86 CSOs meet or materially meeting LTCP (long term control plan) goals
- 13 outfalls short of goals
  - 7 with projects in design or construction (two in Boston significantly complete)
  - 6 Challenging CSOs fully investigated

## Outfall Performance toward LTCP Goals



Several sewer separation projects underway by BWSC that should continue this progress.

The remaining six outfalls will be disproportionately expensive to fix and disruptive to the community, but there are still plans to improve their performance.

Ongoing CSO work:

| OUTFALL  | LOCATION                         | TO BE IMPLEMENTED BY | TENTATIVE SCHEDULED COMPLETION |
|----------|----------------------------------|----------------------|--------------------------------|
| MWR205   | Somerville Marginal CSO Facility | MWRA                 | 2025                           |
| SOM007A/ |                                  |                      |                                |
| MWR205A  |                                  |                      |                                |
| BOS003   | East Boston                      | BWSC                 | Completed 2023                 |
| BOS 009  |                                  |                      | 2024                           |
| BOS014   |                                  |                      | Completed 2023                 |
| CHE008   | Chelsea Creek                    | MWRA                 | Completed 2023                 |
| BOS017   | Mystic/Chelsea Confluence        | BWSC                 | 2024                           |
| BOS062   | Fort Point Channel               | BWSC                 | 2024                           |
| BOS065   |                                  | BWSC                 | 2024                           |
| BOS070   |                                  | BWSC                 | 2024                           |

MWRA has contributed \$11m to BWSC to perform additional improvements to allow BOS17, BOS070/DBC, BOS062 and BOS065 to meet their LTCP goals.

**New Variances for Charles River, Mystic River & Alewife Brook** (August 24) -- Wendy Leo

- Revises and extends the schedule to develop a plan to further reduce or eliminate CSOs in the variance waters.
- Continues monitoring and reporting
- Codifies some of the items that MWRA, Somerville and Cambridge had already agreed to, such as accounting for the effects of climate change and

enhanced public participation including outreach to Environmental Justice communities.

- Adds studies associated with variance CSO of improving public notification, floatables control, and odors. (for details, please refer to the [presentation](#))

**Updated CSO Control Plan:** Erika Casarano, AECOM

MWRA, Somerville and Cambridge meet at least twice a month on updating the CSO Control Plan covering the following:

- Description of existing levels of CSO Control
- Evaluation of Costs and water quality benefits of further CSO control Alternatives
- Public Participation Plan
- Affordability Analysis based on EPA Clean Water Act Financial Capability Assessment Guidance
- Draft Updated CSO Control Plan including a Recommended Plan – December 31, 2025
- Final Updated CSO Control Plan – January 31, 2027

Developing a forward-looking Typical Year; alternatives up to & including full separation, and public participation (sample flyer below):



**Combined Sewer Overflow (CSO) Control Planning Update**  
for the Charles River and Alewife Brook/Mystic River

Did you know that heavy rainfall can cause our sewer systems to overflow and pollute our rivers? Did you know that there are multiple tools available to minimize these overflows?

The Cities of **Cambridge** and **Somerville** and the **Massachusetts Water Resources Authority** are working together to create plans for future sewer improvements that will reduce pollution in our rivers.

Join us virtually to learn about the tools we can use to minimize sewer overflows, improve water quality, and achieve safer and cleaner rivers. We encourage you to get involved and make your voice heard!

*\*Interpretation will be available in Spanish and Portuguese. We can provide you an interpreter in any other language for free. To request an interpreter, please contact us at [somervillema.gov/ContactSomerville](mailto:somervillema.gov/ContactSomerville) or call 311 (617-888-3111) by November 8.\**

**6PM**

Wednesday  
November 15,  
2023

Register online for  
this Zoom meeting.

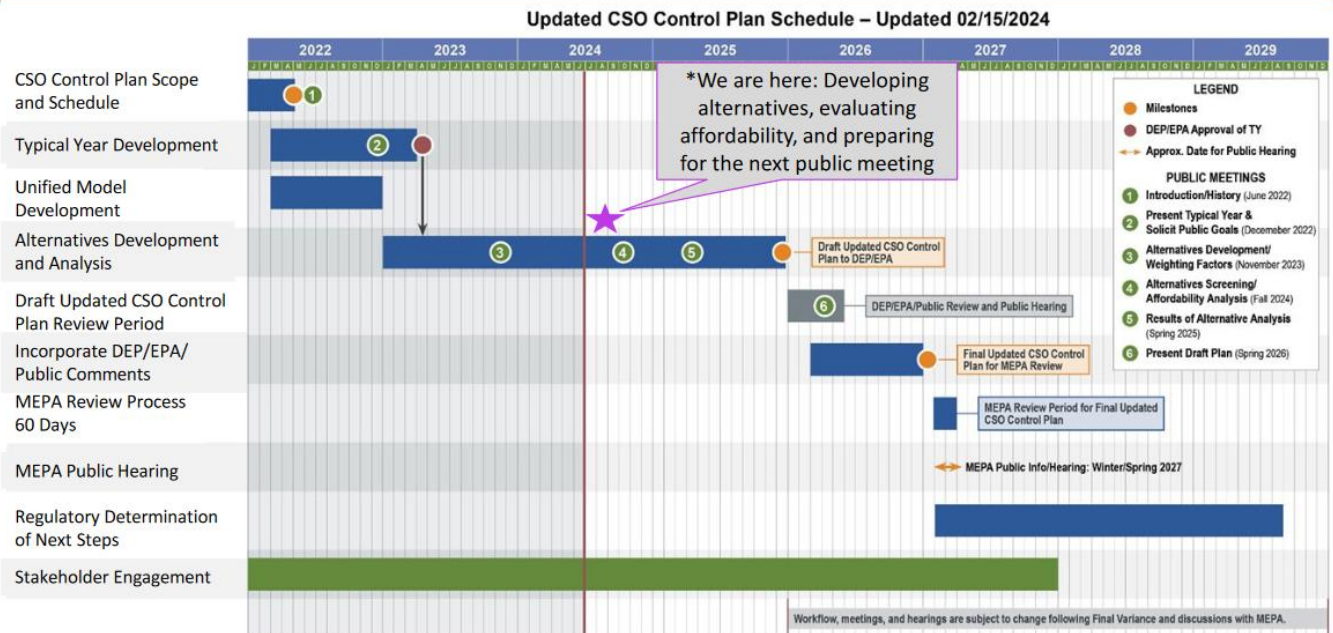


<https://tinyurl.com/CSOmeeting3>

Below is the timeline for this project:



## Timeline



Cambridge, Somerville and MWRA had each been maintaining their own collection systems models, and decided to combine them into a Unified Model. This joint model was checked against prior calibrations and then run using the 2050 Typical Year rainfall as model input.

The table below shows original activation for 1992 Typical Year and the predicted activation for the 2050 TY.

| Outfall                  | 1992 Typical Year -<br>Future Baseline Conditions* |             | 2050 Typical Year -<br>Future Baseline Conditions* |              |
|--------------------------|----------------------------------------------------|-------------|----------------------------------------------------|--------------|
|                          | Activation<br>Frequency                            | Volume (MG) | Activation<br>Frequency                            | Volume (MG)  |
| <b>ALEWIFE BROOK</b>     |                                                    |             |                                                    |              |
| CAM001                   | 0                                                  | 0.00        | 1                                                  | 0.02         |
| CAM002                   | 0                                                  | 0.00        | 0                                                  | 0.00         |
| CAM401A                  | 8                                                  | 5.29        | 12                                                 | 10.95        |
| CAM401B                  | 1                                                  | 0.02        | 3                                                  | 0.30         |
| MWR003                   | 2                                                  | 0.13        | 3                                                  | 1.08         |
| SOM001A                  | 8                                                  | 4.45        | 13                                                 | 8.51         |
| <b>Alewife Total</b>     | <b>8</b>                                           | <b>9.89</b> | <b>13</b>                                          | <b>20.85</b> |
| <b>MYSTIC RIVER</b>      |                                                    |             |                                                    |              |
| SOM007A/MWR205A          | 2                                                  | 1.30        | 8                                                  | 29.31        |
| <b>CHARLES RIVER</b>     |                                                    |             |                                                    |              |
| CAM005                   | 1                                                  | 0.19        | 6                                                  | 0.73         |
| CAM007                   | 0                                                  | 0.00        | 0                                                  | 0.00         |
| CAM017                   | 0                                                  | 0.00        | 3                                                  | 1.04         |
| MWR018                   | 3                                                  | 0.50        | 4                                                  | 1.86         |
| MWR019                   | 2                                                  | 0.26        | 3                                                  | 1.33         |
| MWR020                   | 2                                                  | 0.28        | 3                                                  | 3.14         |
| MWR201 - Cottage<br>Farm | 2                                                  | 6.59        | 4                                                  | 30.12        |
| MWR023                   | 3                                                  | 0.05        | 6                                                  | 0.13         |
| <b>Charles Total</b>     | <b>3</b>                                           | <b>7.87</b> | <b>6</b>                                           | <b>38.35</b> |

\* The Unified Model is still being developed and reviewed. Model results provided in this presentation are preliminary and are subject to change. Model run 06FC

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This table shows you the values for the 2050TY and 5- and 25-year design storms. Impact of the heavier storms is evident:

These bigger storms will be part of the alternatives analysis that includes climate change impacts

| Outfall                  | 1992 Typical Year -<br>Future Baseline Conditions* |             | 2050 Typical Year -<br>Future Baseline Conditions* |              |
|--------------------------|----------------------------------------------------|-------------|----------------------------------------------------|--------------|
|                          | Activation<br>Frequency                            | Volume (MG) | Activation<br>Frequency                            | Volume (MG)  |
| <b>ALEWIFE BROOK</b>     |                                                    |             |                                                    |              |
| CAM001                   | 0                                                  | 0.00        | 1                                                  | 0.02         |
| CAM002                   | 0                                                  | 0.00        | 0                                                  | 0.00         |
| CAM401A                  | 8                                                  | 5.29        | 12                                                 | 10.95        |
| CAM401B                  | 1                                                  | 0.02        | 3                                                  | 0.30         |
| MWR003                   | 2                                                  | 0.13        | 3                                                  | 1.08         |
| SOM001A                  | 8                                                  | 4.45        | 13                                                 | 8.51         |
| <b>Alewife Total</b>     | <b>8</b>                                           | <b>9.89</b> | <b>13</b>                                          | <b>20.85</b> |
| <b>MYSTIC RIVER</b>      |                                                    |             |                                                    |              |
| SOM007A/MWR205A          | 2                                                  | 1.30        | 8                                                  | 29.31        |
| <b>CHARLES RIVER</b>     |                                                    |             |                                                    |              |
| CAM005                   | 1                                                  | 0.19        | 6                                                  | 0.73         |
| CAM007                   | 0                                                  | 0.00        | 0                                                  | 0.00         |
| CAM017                   | 0                                                  | 0.00        | 3                                                  | 1.04         |
| MWR018                   | 3                                                  | 0.50        | 4                                                  | 1.86         |
| MWR019                   | 2                                                  | 0.26        | 3                                                  | 1.33         |
| MWR020                   | 2                                                  | 0.28        | 3                                                  | 3.14         |
| MWR201 - Cottage<br>Farm | 2                                                  | 6.59        | 4                                                  | 30.12        |
| MWR023                   | 3                                                  | 0.05        | 6                                                  | 0.13         |
| <b>Charles Total</b>     | <b>3</b>                                           | <b>7.87</b> | <b>6</b>                                           | <b>38.35</b> |

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So far have identified several tools for CSO control:

- Sewer Separation
- Green Stormwater Infrastructure
- Infiltration/Inflow Reduction
- Storage
- Conveyance
- Treatment

Here's a conceptual model of activations if we do "full" sewer separation, and you can see that there would still be overflows:

| Outfall                | 2050 TY-<br>Future Baseline Conditions*<br>Full Separation |                             |                | 2050 2 Year<br>Design Storm<br>Full Separation |                | 2050 5 Year<br>Design Storm<br>Full Separation |                | 2050 10 Year<br>Design Storm<br>Full Separation |                | 2050 25 Year<br>Design Storm<br>Full Separation |                |
|------------------------|------------------------------------------------------------|-----------------------------|----------------|------------------------------------------------|----------------|------------------------------------------------|----------------|-------------------------------------------------|----------------|-------------------------------------------------|----------------|
|                        | Activation<br>Frequency                                    | # of outfalls<br>activating | Volume<br>(MG) | # of outfalls<br>activating                    | Volume<br>(MG) | # of outfalls<br>activating                    | Volume<br>(MG) | # of outfalls<br>activating                     | Volume<br>(MG) | # of outfalls<br>activating                     | Volume<br>(MG) |
| Alewif Brook<br>Total  | 0                                                          | 0                           | 0.00           | 1                                              | 0.02           | 1                                              | 0.15           | 1                                               | 0.38           | Run in progress                                 |                |
| Mystic River<br>Total  | 0                                                          | 0                           | 0.00           | 1                                              | 0.68           | 1                                              | 3.63           | 1                                               | 6.03           | 1                                               | 8.93           |
| Charles River<br>Total | 6                                                          | 2                           | 0.27           | 2                                              | 9.15           | 5                                              | 19.07          | 6                                               | 25.42          | 8                                               | 40.66          |

- “Full” separation assumes approximately 90% of runoff area is removed from the combined sewer system
- In large storms, the remaining 10% can still result in overflows

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\*\*The Unified Model is still being evaluated for use with storms larger than the TY. Discharge volumes during storms larger than the Typical Year may not account for overland flows that could potentially affect the CSO discharge volumes.

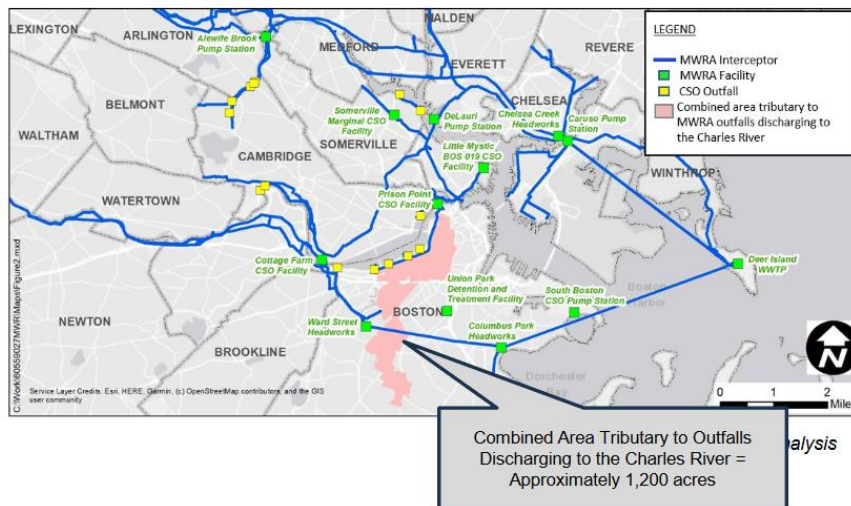
We also looked at Green Infrastructure—this model shows what would happen if we captured the first 1.5 inches of rain, 1200 acres, 150-200 projects about 1,000 cu feet. Activation & discharge volumes in the bottom left—so even with all those projects, only reduce discharge volumes by 0.13MG.

## **Charles River 2050TY Charles River Green Infrastructure** Preliminary Draft – Working Document

### Green Infrastructure

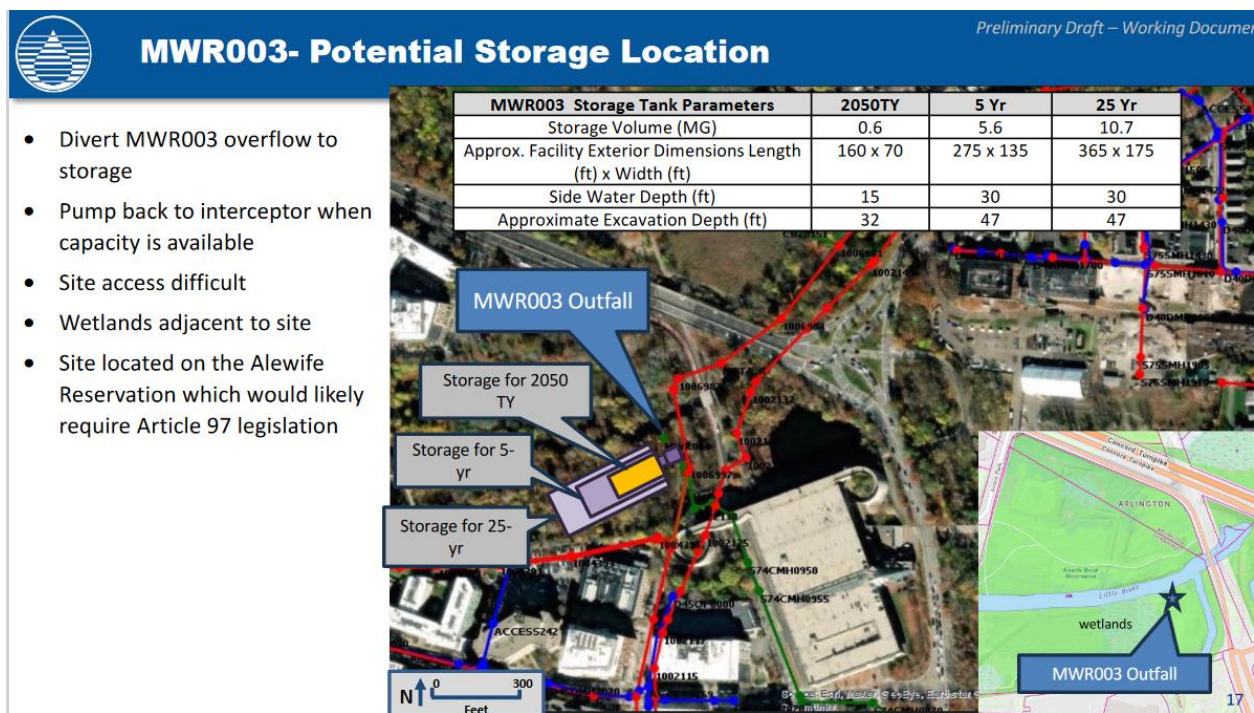
- First 1.5-inch of rain over 10% of the Right of Way impervious area was conveyed to Green Infrastructure
- Boston: 150-200 projects assuming 1,000 cubic feet (cf) storage capacity per GSI project

| 2050 Typical Year           |             |             |
|-----------------------------|-------------|-------------|
| Outfall                     | Baseline    | GSI         |
|                             | Volume (MG) | Volume (MG) |
| MWR018                      | 1.85        | 1.82        |
| MWR019                      | 1.33        | 1.28        |
| MWR020                      | 3.07        | 3.02        |
| <b>SUM (MWR018/019/020)</b> | <b>6.25</b> | <b>6.12</b> |



For Discussion with EPA and DEP

Here's a storage graphic for MWR003, including screening and pump-back facilities. Smallest box, yellow, for 2050 TY, purple boxes show size needed for larger storms. Sensitive area and would require the use of parkland:

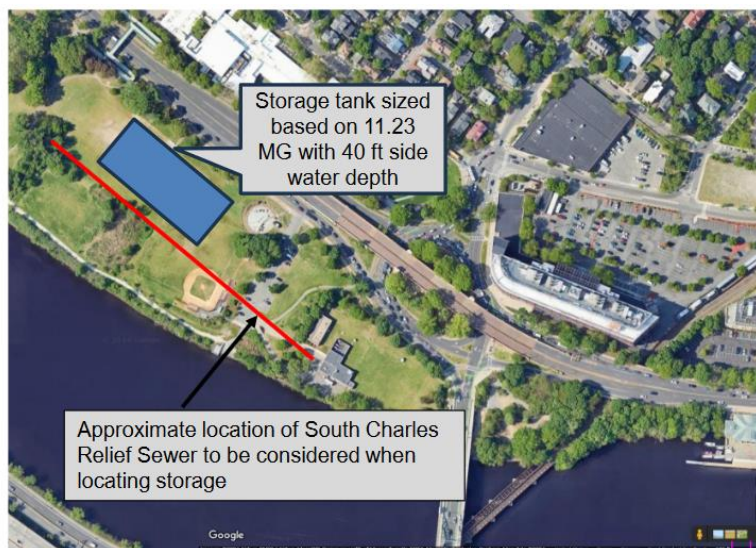


This example shows what storing 2050 TY volume at Cottage Farm could look like. Assuming would have to go under this sports field. Dimensions are approximate:

| Storage Tank Parameters                   | 40 ft SWD |
|-------------------------------------------|-----------|
| 2050 TY Storage Volume (MG)               | 11.23     |
| Length (ft) x Width (ft)                  | 340 x 155 |
| Ground Elevation (ft AD)                  | 115       |
| Excavation Depth (ft)                     | 65        |
| Elevation of Bottom of Excavation (ft AD) | 71        |

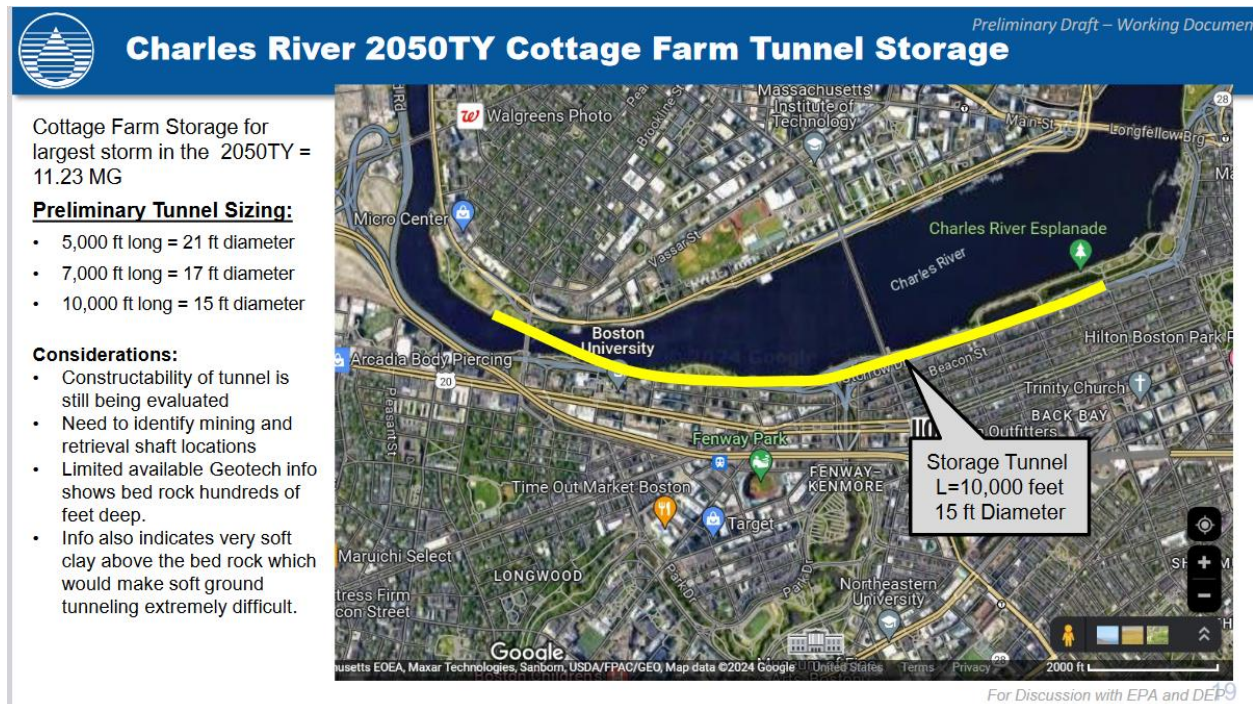
**Considerations:**

- Exterior dimensions of facility are approximate and include estimations of required area for influent screens and dewatering pumps.
- Eversource ductbank to be constructed on this site. Construction estimated to start in 2025.



Might also have to relocate the relief sewer and the Eversource duct bank that's supposed to go here.

And if we were instead to build a tunnel near Cottage Farm for the 2050TY, this is *roughly* what this might be aligned –no shafts yet, but this would be a 15' diameter, 10,000' long tunnel. Preliminary Geotech shows a layer of soft clay over bedrock, so would want to be into the bedrock, not the clay.



We also could consider wider tunnels that are shorter. Continuing to investigate constructability.

## Questions

Q: Why 1.5" storage for the green infrastructure? Might it be less? Most communities are looking to infiltrate the first inch. Seems aggressive.

A: A: We're just trying to infiltrate the first 1.5". If it rains less, no issue. Problems arise if it rains more. Trying to mitigate those peak flows. The standard is area-specific – 1.5" is what Boston uses.

Q: Can you compare the storage tunnels under discussion with the Dorchester tunnel? Would you be installing multiple tunnels or just one tunnel? Would it be more cost effective to install two tunnels at Cottage Farm?

A: The Dorchester tunnel stores 18MG. It was designed for a 25-year event at the time. Captures combined sewage up to a 25-year event. To date, never had an event that exceeds that storage capacity, but can move stormwater to the beaches rather than to the tunnel.

A: As for the cost effectiveness of various alternative tunnel configurations, that's what we are evaluating. Not sure would do a storage tank and a tunnel at Cottage Farm, but looking to pick up multiple outfalls, not just Cottage Farm.

Q: Could a storage tank be located under the Alewife T garage? How about near the tracks?

A: Haven't looked at that yet, but would have to be incorporated early in the design of the garage, and might involve pumping.

And getting into active track areas and MBTA land is complicated.

A cost-benefit analysis is due in 2025.

Q: Questions about individual outfalls—answer that it isn't simple or cheap.

A: Sewer separation: one of the tools we need to evaluate. Sometimes sewer separation is fully successful, but other times have drains that connect and get to only 75-85% success.

Q: Would green infrastructure in Boston raise the water table and perhaps affect the wood piling supporting buildings in Back Bay?

A: MWRA is looking at that with Boston, and looking to protect that underground infrastructure, perhaps with perforated pipes, to keep the groundwater levels high.

Q: Even a small benefit from green infrastructure can be helpful—also has more benefits than just water storage.

A: BWSC is installing quite a bit of green infrastructure in Back Bay just for that reason.

Q: How do storage and sewer separation combined relate?

A: As each entity establishes what projects they may undertake, we combine them and run the unified model—and then we adjust. There's a lot of back and forth.

Q: One alternative for the Alewife T garage is completely replacing it, which seems like a once-in-a-generation opportunity to site combined sewer infrastructure there.

A: Thanks for the information—please send details.

Q: Assuming gastrointestinal issues are part of the problem with CSO and that the Alewife is in an EJ community, how does that risk/benefit analysis play into calculations?

A: MWRA had been doing this before, but it is now part of the variance. The drinking water is not affected by CSO here, since it comes from the Quabbin system, not the river.

Next Meeting: Nov. 1, 10:30, Virtual. Topic is climate change impacts on the sewer system.