

SAVE THE ALEWIFE BROOK

April 28, 2022

Todd Borci, EPA

Kevin Brander, DEP

Dear Mr. Borci & Mr. Brander,

Please find following Save the Alewife Brook's CSO Control Plan Draft Scope for your review. We look forward to ongoing discussions with you and with the great cities of Somerville and Cambridge, as well as the Massachusetts Water Resources Authority, in the development of a new plan to eliminate CSO pollution in the Alewife Brook.

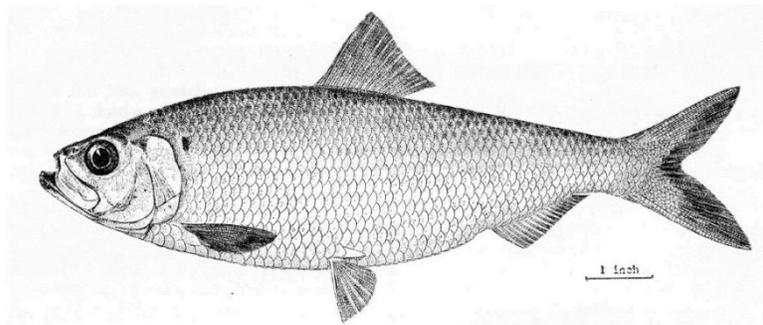
Sincerely,

Kristin Anderson, David White, David Stoff, Gwen Speeth

cc:

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Lucica S. Hiller, City of Somerville
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Somerville Board of Health



SAVE THE ALEWIFE BROOK

Alewife CSO Control Plan Draft Scope

The Path to Zero Sewage Pollution

for a Safe, Beautiful, Fishable Brook for Residents and Wildlife

Three entities – the City of Cambridge, the City of Somerville, and the Massachusetts Water Resources Authority (MWRA) have submitted draft scopes to the federal Environmental Protection Agency and to the state Department of Environmental Protection for the development of a new Long Term Control Plan (LTCP) for the Combined Sewer Overflows (CSOs) in the Mystic and Charles Rivers watersheds. Missing from these three scopes is a regional approach to address the under-represented Environmental Justice Populations who will be most affected by the outcome of the new CSO Control Plan. These include residents who receive the Alewife’s hazardous flood waters in their homes, yards, and parks during flood events. Documented adverse health effects from unavoidable contact with contaminated Alewife flood waters have included, but were not limited to: severe abdominal cramping, bloody diarrhea, headaches, nausea, and vomiting.

The Alewife Basin is densely populated, with 5,000 people living in the Alewife’s 100-year flood plain. Due to the flood-prone topography of the Alewife Basin, when flooding occurs, the flood water can remain for days before receding and flowing out to the Boston Harbor via the Mystic River.

During major flood events, the water level in the Mystic River can rise, causing the Alewife Brook to reverse direction and send hazardous untreated sewage from Belmont, Cambridge, and Somerville into East Arlington, Belmont, and North Cambridge neighborhoods.

Save the Alewife Brook presents its own CSO Control Draft Scope to better represent the humans and other species whose health and well-being are directly impacted by the hazardous effects of untreated sewage discharge in the Alewife Brook.

Section 1: Description of the Alewife's CSO History to Present Systemic Failures

Over 150 years ago, the original sewer system in the city of Cambridge was designed and constructed as a combined sewer. At that time, Cambridge also paid for the design and construction of a combined sewer system in Somerville, as Cambridge businesses had financial interests in doing so, and Somerville did not have the means.

As early as 1874, the combined sewer systems in the Alewife area were known to present environmental health hazards to the poverty-stricken population living by the Alewife, near Tannery Brook. At that time, the Commonwealth advised against the discharge of sewage into the Alewife Brook to protect the fishing rights of vulnerable residents living at the Almshouse. Thirty-three years later, in 1907, the Commonwealth's Board of Health declared the Alewife Brook to be unsanitary because of sewage discharge, and recommended that the combined sewers be separated.

A hundred years later, a significant effort to clean up the Boston Harbor achieved remarkable results for the waters and the beaches of the Harbor, and for real estate values along the Boston waterfront. That is a wonderful accomplishment. However, the CSOs still in place on the east side of the Alewife Brook are responsible for discharging twice as much untreated sewage pollution in 2021 as they did in 1992.

Unfortunately, the CSO control work in the Alewife Brook over the last twenty years has produced little improvement in the frequency or volume of Alewife CSO pollution discharges. That the metered volume of CSO discharge in the Alewife Brook in 2021 was double the volume in 1992 may be due, in part, to the original LTCP investment in Alewife CSO infrastructure that led to the reconstruction of MWR003 (MWRA's Alewife CSO) in 2015. MWR003 was enlarged to increase overflow volume. Its function was altered so that its role now is that of providing hydraulic relief for the entire system upstream of the Chelsea Creek Headworks, which includes 17 municipalities. This functionality added capacity to the MWRA's sewer system for 17 municipalities by increasing hazardous sewage discharge volumes in the Alewife Brook.

untreated combined sewage pollution in the Alewife Brook is double in 2021 what it was in the 1992 Conditions that were used as a benchmark in the MWRA's Final CSO Performance Assessment Report. Even more alarming is the fact that the volumes of metered CSO discharge are seeing significant growth since 2015.

Finally, the Alewife Brook is a small waterbody. Even if it were meeting the LTCP targets, allowing for 7.29 million gallons of untreated combined sewage in this waterbody is not comparable to the same amount of untreated sewage in a much larger waterbody that would be better able to dilute the pollution. Our position is that untreated sewage pollution should be eliminated throughout the MWRA's entire sewer system, but the Alewife CSOs disproportionately impact area populations because of the flood-prone topography of the Alewife Basin, the population density around the Alewife Brook, and the limited capacity of the waterbody to absorb the CSO flows.

Section 2. Development of an Update to the “Typical Year” Model

The “Typical Year” model that has been used for the 2021 Final CSO Performance Assessment incorporates weather data going back to 1949. It is no wonder, then, that in the last four years, the MWRA’s “Typical Year” model had no resemblance to the actual discharge amounts to the Alewife Brook. The “Typical Year” model has been used to prove legal CSO compliance when there is none. For example, in 2018, the MWRA’s “Typical Year” model reported total Alewife CSO discharge volume of 5.12 Million Gallons (MG), which is below the legal LTCP requirement of 7.26 MG. The 2018 reality was a discharge volume of 15.85 MG. In 2021, the MWRA “Typical Year” model reported a total of 6.26 MG CSO discharge, while actual metered data showed 52.299 MG CSO discharge. The CSO modeling based on the MWRA’s “Typical Year” does not represent reality.

Climate Change in the area is projected to bring an increase in precipitation volumes, and in severity of events. The failed “Typical Year” model must be replaced with two new models: a planning model and a performance model, both based on climate projections.

The newer NOAA Intensity/Duration/Frequency (IDF) curves reflect more recent climate data and produce significantly higher estimates for rainfall and for sewer flow design requirements than older IDF curves. New CSO infrastructure planning should be informed by this, as it may spur need for larger interceptor capacity, more pumping capacity, while providing parallel opportunities to add more in-system storage as older infrastructure is modified to address future conditions.

Planning Model:

A Forward-looking model must be used for planning new upgrades to ensure efficacy during the lifecycle of the infrastructure. New infrastructure must have the capacity to manage expected precipitation. This planning model should incorporate resources available to the MWRA, Cambridge, and Somerville, to approximate conditions for the period 2030-2100. Resources that should be considered include: 1) The City of Cambridge’s own Climate Change Projections for the City of Cambridge Resiliency Report, and 2) Resources available at the Resilient MA Climate Change Clearinghouse for the Commonwealth (Clearinghouse).

Performance Model:

A separate performance model should be created for CSO performance assessment reporting purposes. A performance model should use weather data from the past 10 years from the date of reporting, without eliminating severe events. It should also include Climate Change

projections going into the future at least 10 years, and it should be tethered to actual, metered calendar year discharge volume and activation frequency data.

The table and figure below show recent CSO discharges and how much they have differed from the results of the Typical Year model.

2021 Alewife CSO activations (MG=Million Gallons Untreated Combined Sewer Overflow Discharge)

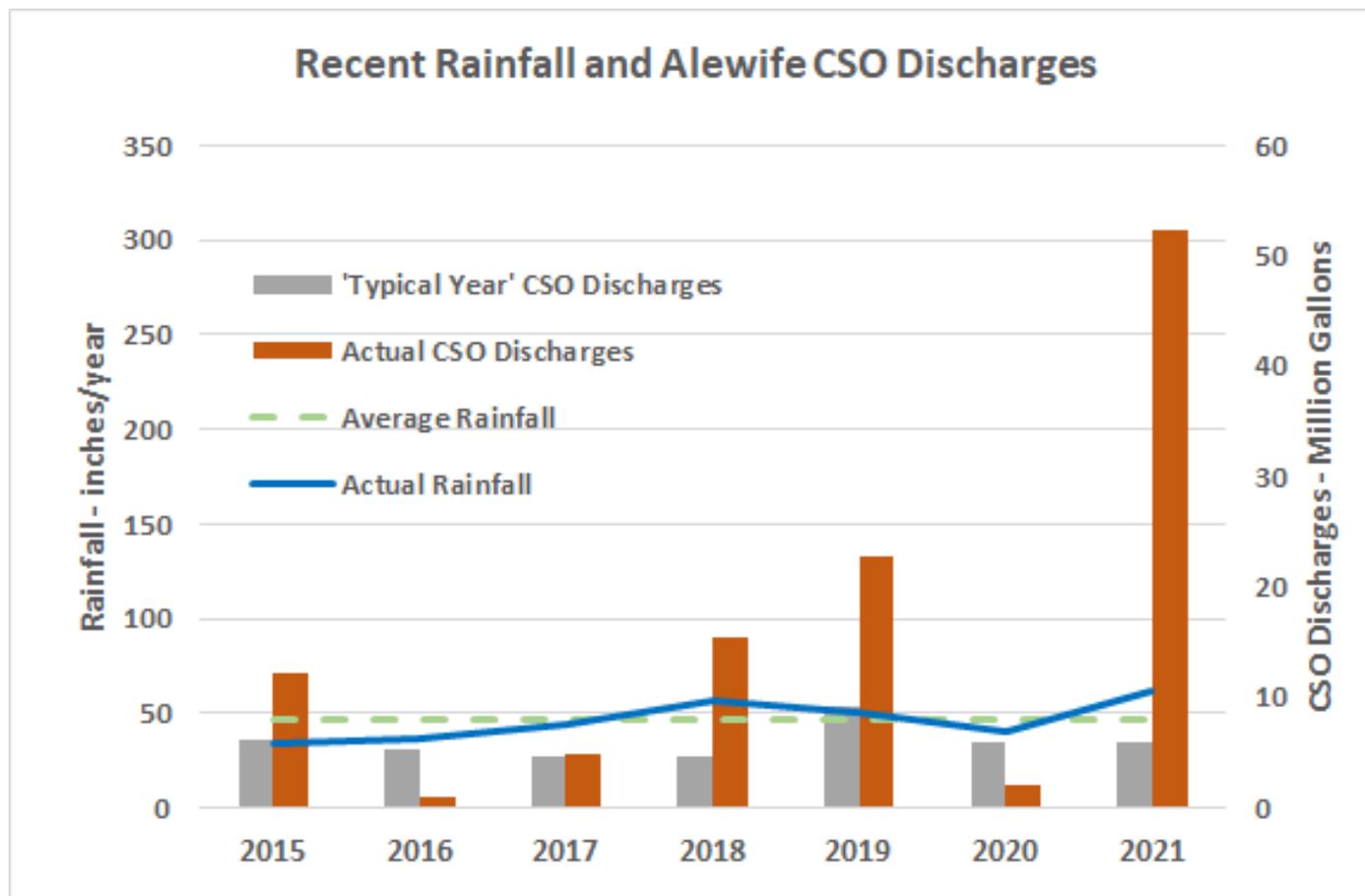
OUTFALL	2021 Actual / Metered ¹		1992 Conditions ²		LTCP Legal Requirement ²		MWRA "Typical Year" model ²	
	frequency	volume MG	frequency	volume MG	frequency	volume MG	frequency	volume MG
MWR003	5	21.10	6	0.67	5	0.98	3	0.61
CAM001	9	0.50	5	0.15	5	0.19	1	0.02
CAM002	0	0	11	2.73	4	0.69	0	0
CAM004	Closed	n/a	20	8.19	Closed	n/a	Closed	n/a
CAM400	Closed	n/a	13	0.93	Closed	n/a	Closed	n/a
CAM401A	15	10.59	18	2.12	5	1.61	5	0.66
CAM401B	8	2.13			7	2.15	4	0.50
SOM001A	8	17.98	10	11.93	3	1.67	8	4.47
SOM004	Closed	n/a	5	0.09	Closed	n/a	Closed	n/a
Total MG		52.30		26.81		7.29		6.26

Notes:

Somerville was the first municipality in the Boston area to start closing their combined sewer outfalls during the Boston Harbor Clean-Up court case. Somerville closed 4 CSOs in the 1990s. The first CSO Long Term Control Plan began implementation in 2006, and construction ended in 2015.

References:

1. From the Permittees' CSO Notification Webpages
2. December 2021 MWRA Final CSO Performance Assessment Report, P. 2-4, Table 2-2



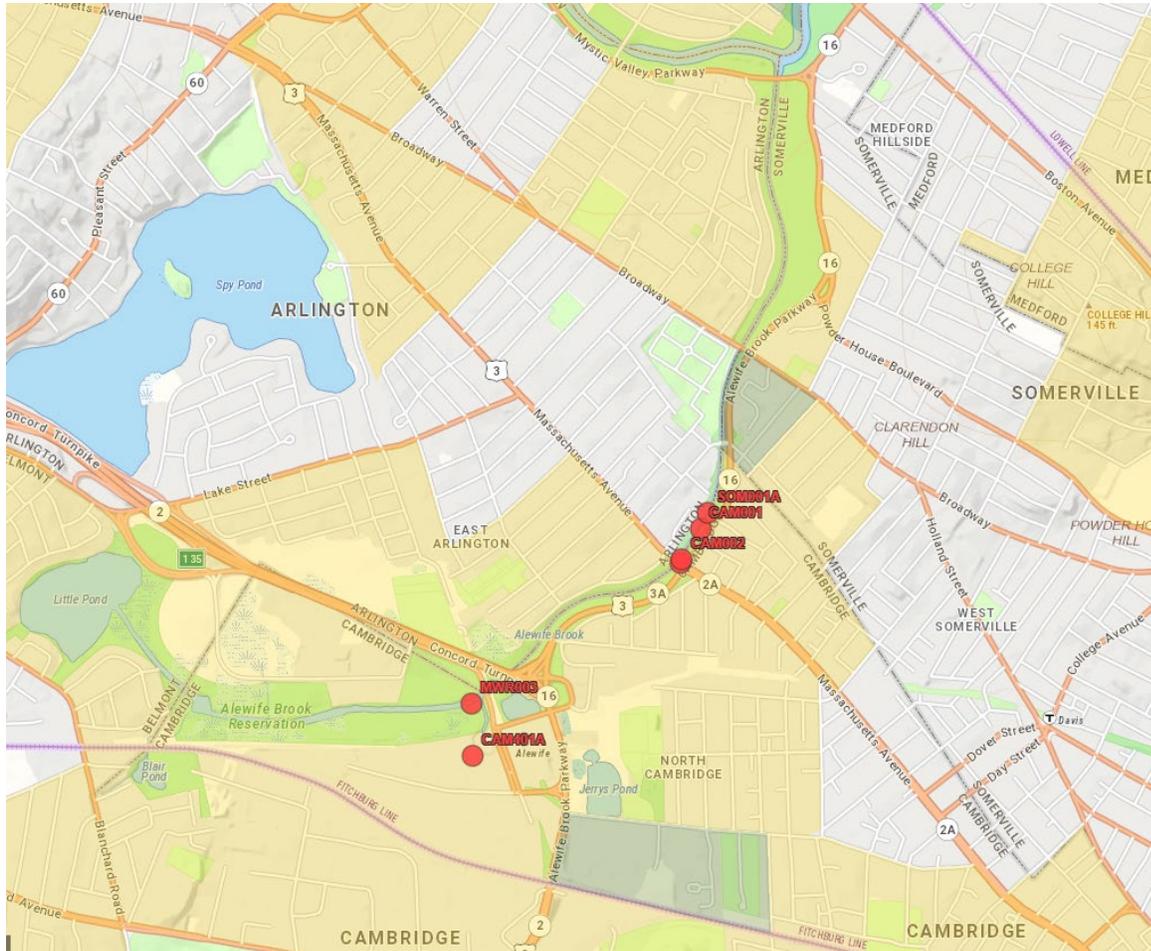
Average annual rainfall is c. 46 inches (which varied by -27% to +33% during this seven-year period). The gray bars show the predicted CSO discharges based on the MWRA's "Typical Year" model, and average 6 million gallons per year. Actual CSO discharges, while varying considerably, average 15.8 million gallons per year, which is almost three times as much as predicted by the model. This clearly demonstrates that the CSO modeling based on the Typical Year does not represent current reality.

* [This graph uses data provided by MWRA to the Arlington Select Board on 2/14/22.

Actual storm events drive the CSO discharges -- annual rainfall serves here as a proxy for that mechanism.]

Section 3. Alewife CSO Impacts on Environmental Justice Populations

We must identify members of the Environmental Justice Populations in the watershed who are impacted by CSO sewage pollution. Impacts may include poor health outcomes from unavoidable contact with untreated sewage-contaminated flood waters, or it may include financial hardships associated with cleanup from sewage discharges and reduced real estate values.



Environmental Justice Populations along the Alewife Brook. Alewife CSOs are marked in red.

Section 4: Water Quality, Green Infrastructure, & Flood Mitigation

The water quality in the Alewife Brook is unacceptable. Stormwater should be treated using a combination of grey and green infrastructure on public (i.e. DCR) land before it enters the brook. An investment should be made to construct more large wetlands, bioswales, and other green infrastructure in the Alewife sub-watershed, using the Alewife Reservation wetland as a model. Holding tanks should be constructed to reduce flooding and attenuate flow. Rather than using poor water quality as an excuse to avoid elimination of Alewife CSOs, the new CSO control plan must incorporate green and grey infrastructure that will improve water quality. Finally, any system design changes must be evaluated, incorporating future Climate Change projections, to ensure no increases to flooding along the Alewife Brook.

Section 5. Funding

The cost of doing this work may have been \$10,000 in 1907, and \$129 million in 2001. One thing is certain: it will cost much more in the future than it will now. Any substantial costs should be seen as job-creation opportunities, allowing us to invest for a more resilient future.

Creative funding solutions must be employed to implement the new CSO control plan. The burden should not fall upon the rate payers in the MWRA system who cannot afford rate increases. The MWRA could create a Tiered Rate Payer Structure, to eliminate the burden on populations who cannot afford rate increases. It could also charge more to upstream communities, based on the amount of excess stormwater in their discharge to the MWRA system, and use those extra funds to help pay for CSO mitigation work. The additional charge would also serve as an incentive for upstream communities to better reduce their stormwater inflow to the MWRA system.

State and Federal infrastructure money should be used to help pay for this work. To the best of our knowledge, only Save the Alewife Brook has thus far made any attempt to apply for Federal Infrastructure monies. The CSO permittees must advocate for Federal Infrastructure funds to be spent on controlling, and ultimately eliminating, CSO discharges in the Alewife Brook.

A CSO fee could be created to incentivize the CSO permittees to stop polluting. For example, the permittees could pay for each metered gallon of sewage pollution that is discharged. The monies raised from sewage discharge should be used for Alewife sub-

watershed CSO elimination. Or a state fund could be established to reduce and eliminate CSOs throughout the Commonwealth.

Inflow & Infiltration reduction funding raised from new developments that will discharge sewage in the Alewife sub-watershed could be used to eliminate sewage pollution in the Alewife sub-watershed, rather than being spent in other parts of the permittee cities.

Green infrastructure money could be raised by levying fees on the gas company, which is allowed to use state DCR property to run its gas lines, or from DOT, whose Parkway is a source of pollutants flowing into the watershed.

Section 6. Public Participation

Stakeholders must be identified throughout the watershed, allowing a regional approach for public participation. The public must be allowed to comment at the earliest stages of the CSO Control Plan process, especially during the development of the Planning and Performance Models.

All stakeholders within the watershed must be invited to all public CSO meetings. The first Alewife CSO public meeting took place in March, before Draft Scopes and Schedules were released to the public and the regional stakeholders, including those most impacted by CSO pollution, were not informed, preventing them from having a voice at the public meeting, and leaving them unaware of what was discussed.

There must also be an opportunity for public input on the MWRA's new affordability analysis. That would provide the public with an understanding of the costs involved, and give them the ability to suggest funding options that MWRA has not previously incorporated into its analyses.

Section 7. Schedule

A schedule should be established that includes public participation in the development of the new "Typical Year" planning model. It is unreasonable to expect a new model to be developed by May 31, 2022. That date should be pushed out to include public process in its development.

There should be at least four public participation charrettes, where stakeholders throughout the watershed are able to help explore ideas before engineers develop models and alternative scenarios.

Acknowledgements

We wish to thank the Mystic River Watershed Association (MyRWA) and the Charles River Watershed Association (CRWA) for their input and discussions that have helped us better understand the situation and develop this document.

Appendix

Specific Comments on the Submitted CSO Control Plan Scopes

Save the Alewife Brook has reviewed the three draft scope documents from the City of Cambridge, the City of Somerville, and the Massachusetts Water Resources Authority. We find positive elements in all of them. We will discuss each in sequence, identifying the important components, and then summarize our recommendations.

Cambridge

This is the most extensive of the scope documents and has many positive elements:

- **Climate Equality and Resiliency (3.3)** cites both “Environmental Justice Populations affected by CSOs and floods” as well as “Resiliency in larger storm events.”
- **Collection System Model Updates and Calibration (4.1)** indicates that the model updates will include as-built information. It should also consider planned and likely developments.
- **Criteria for CSO elimination (4.2.3)** mentions “controlling CSOs in a specific large design storm” This is an important consideration as large storms are often associated with flooding.
- **The Basis of Design Goals (4.3)** calls for identifying the “Typical Year storm scenario(s) to be used.” More than one scenario must be used to identify the range of the likely impacts.
- **Develop Alternatives (5.3)** has an excellent list of concepts, alternative pathways (including a “path to zero”) and candidate projects that should be included in all the plans.
- **Public Participation Plan and Outreach (6)** discusses “... educating and mobilizing the public ...” while we think a better focus would be “informing, engaging and listening to the public”.
- **Stakeholder identification and interviews (6.3)** is a good approach and should be in all the plans. We note that this should not just include Cambridge but the entire watershed areas.
- **Public Meetings and Events (6.5)** includes a regional initial public meeting, public meetings during the CSO planning and public outreach events. We suggest that there be no less than 3 public outreach events for each watershed area and that they be held in the evening for maximum public involvement.
- **Water Quality Analysis (7)** refers to the Typical Year which we believe is not an adequate approach. Rather a number of years should be considered especially those with flooding events.
- **Alternatives Analysis (8)** has a good range of benefit criteria. We believe that the benefits of risk reduction during flooding events are very important especially for the abutters along Alewife, many of whom are in environmental justice communities.

Somerville

The Somerville Control Plan has several good elements that should be included in the combined analysis.

- Task 1 discusses public health impacts which are very important in considering what to do. They specifically mention “Existing high-risk flood areas, reported backups and SSOs and other public health and safety issues directly or indirectly related to CSOs ...”
- In task 2.1 they specifically list the Nine Minimum Control Measures (NMC) that should be specifically addressed in all the plans.
- In task 2.3 they refer to both an updated typical rainfall year and extreme rainfall events. We agree that while an updated Typical Year is important it is not adequate to represent in more extreme situations.
- In task 2.4 they list both a baseline pollution load assessment and the impacts to the receiving waters. This should be part of all the plans.
- Task 3 public participation discusses “To allow for early, frequent, and continuous consultation with the public ...” which we strongly endorse.
- Task 3.2 focuses on environmental justice, but only the areas in Somerville are identified. All of the potentially effected EJ areas in the watershed should be considered.
- Task 4 discusses CSO Control in a fairly comprehensive manner. It also identifies two approaches to CSO elimination as well as other options such as relocation and storage. They also make a reference to evaluating up to eight alternatives which may or may not be enough. To come up with the best solution a wide range of options should be considered.
- Task 4.2 discusses water quality impacts but only appears to consider this for a Typical Year. This is inadequate as it does not consider what happens in other situations which are not infrequent. The design storms as mentioned in sub-task 2.3 should also be evaluated.
- This document also includes a proposed schedule which is quite helpful. There should be active public outreach and participation throughout the entire period.

MWRA

The MWRA plan is the least detailed but has a number of good aspects.

- The typical year analysis (2.2) recommends an update based on more recent data. While this is a step forward, we believe that future climate change effects should be considered as the infrastructure that is built will be in place for many decades.
- But they also (2.2.3) discuss considering design storms greater than the Typical Year, which is essential.
- The alternative development and evaluation section 4.2 discusses identifying sensitive use areas and environmental justice communities, but does not indicate the evaluation criteria.
- The public participation section (5) considers the Charles River and the Alewife Brook/Mystic River watersheds separately, which will affect the nature of public involvement.

Save the Alewife Brook Recommendations

Summary of points identified in the three scope documents, focusing is on the Alewife/Mystic River watershed, though also relevant for the Charles River.

- The focus should be on the entire watershed, not only within boundaries of the permittee communities. Arlington, Belmont and Medford are also affected by what happens in the Alewife. An integrated watershed approach is needed.
- Public participation and outreach should be extensive, with many meetings throughout the planning period to adequately represent public concerns. Meetings should be at the watershed level, and preferably in the evening to allow for wider participation.
- Analysis should consider what could be done on DCR land, and land in Arlington and other communities, especially with regard to green and gray infrastructure.
- Any Typical Year must be updated to represent the future impacts of climate change.
- A single Typical Year is inadequate to represent what happens over several years, especially years with greater rainfall. A number of design years with greater rainfall should also be used in the evaluations.
- Water Quality is a multi-dimensional consideration and needs to be investigated in all its aspects. The water quality measure typically used is based on the number of days that the e-coli concentration exceeds a specified level. This does not capture the complexity of the problem. For example, it does not look at the degree of exceedance, a level that is 10 times beyond the threshold is much more impactful than one that is 10% beyond. Likewise, **many people would consider raw sewage with possible infectious components more of a problem than stormwater runoff**. Flooding events cause the worst damage because they can bring contaminants onto people's properties and into their homes.
- A variety of funding methods that are not dependent on MWRA ratepayers must also be explored. The cities of Cambridge and Somerville should contribute, while also seeking state and federal funds.