

CITY OF SOMERVILLE, MASSACHUSETTS
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April 1, 2022

Kevin Brander, PE
Section Chief Municipal Services Section
DEP Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

And

Todd J. Borci
Office of Environmental Stewardship
US EPA New England
5 Post Office Square, Suite 100
Boston, MA 021109-3912

Re: Somerville Updated CSO Control Plan Scope of Work and Schedule

Dear Mr. Brander and Mr. Borci,

Enclosed please the City of Somerville's Updated CSO Control Plan Scope of Work and Schedule for your review and approval as required by the *Final Determination to Adopt a Variance for Combined Sewer Overflow Discharges to Alewife Brook/Upper Mystic River Basin* issued by MassDEP in 2019.

If you have any questions, please contact me at 617-448-3716 or lhiller@somervillema.gov.

Regards,

Lucica Hiller

Lucica S. Hiller, EIT
Stormwater Program Manager

Attachment: *Somerville Updated CSO Control Scope of Work and Schedule April 1, 2022*





cc: Rich Raiche, City of Somerville
Brian Postlewaite, City of Somerville
Catherine Woodbury, City of Cambridge
Kathy Watkins, City of Cambridge
Brian Kubaska, MWRA
James Barsanti, MassDEP
Kathleen Baskin, MassDEP
Douglas Fine, MassDEP
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Kenneth Moraff, EPA
Beth Kudarauskas, EPA
Dan Arsenault, EPA



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SOMERVILLE UPDATED CSO CONTROL PLAN SCOPE OF WORK AND SCHEDULE

As part of the *Final Determination to Adopt a Variance for Combined Sewer Overflow Discharges to Alewife Brook/Upper Mystic River Basin* of 2019 issued by MassDEP (the Variance), the City of Somerville is developing an Updated CSO Control Plan Scope of Work and Schedule (CSO Control Plan) for review and approval by MassDEP and EPA. This document presents a proposed scope and schedule of work outlining the different elements needed for the development of the City's CSO Control Plan and satisfy the first deliverable requirements as outlined in the Variance.

The Scope of Somerville's CSO Control Plan development includes the following tasks

TASK 1. REVIEW OF PUBLIC HEALTH IMPACTS AND REGULATORY ENVIRONMENT

Under this task the following aspects of the current day system conditions and system impacts will be documented.

1. Public Health Impacts: Existing high-risk flood areas, reported backups and SSOs and other public health and safety issues directly or indirectly related to CSOs and poor drainage will be captured in this section.
2. Regulatory requirements. Somerville will perform a compilation of current regulations and city ordinances that govern its CSO control and stormwater management. This will include, but is not necessarily limited to:
 - a. NPDES Permits for CSO control and MS4 requirements
 - b. Other requirements such as city ordinances or practices dealing with stormwater nutrient control, stormwater flow management, inflow and infiltration control, or requirements and initiatives adopted for climate change preparedness and resiliency.





TASK 2. EVALUATION OF EXISTING LEVEL OF CSO CONTROL

In order to evaluate the existing level of CSO control, the City of Somerville plans to execute the following tasks.

Sub-Task 2.1- Evaluation of the Current Degree of Implementation of the Nine Minimum Control Measures (NMC)

The City of Somerville will evaluate the current degree of implementation of the applicable NMC measures and evaluate their effectiveness. The NMC measures include:

1. Proper operation and regular maintenance programs for the sewer system and the CSOs.
2. Maximize the use of collection system storage: Somerville will provide information regarding utilization of its in-system storage in areas tributary to SOM-001A and SOM-007A CSOs during the updated Typical Rainfall Year as agreed to report compliance. Somerville will use its hydraulic model for this purpose and report current utilization and optimization of its system storage.
3. Review and modification of the pretreatment program.
4. Maximization of flow to the Publicly Owned Treatment Works (POTW) for treatment.
5. Prohibition of CSO during dry weather.
6. Control of solids and floatable materials from CSO.
7. Pollution Prevention Programs that focus on contaminant reduction activities.
8. Public Notification System of CSO discharges and their impacts.
9. CSO Monitoring.

The City is currently working on updating the Nine Minimal Control Plan document, which will inform the CSO Control Plan.

Sub-Task 2.2 - Coordination with City of Cambridge and with MWRA

The City of Somerville meets with MWRA and Cambridge on a regular basis to discuss existing conveyance system conditions and understand impacts on each other's systems. As part of a continued collaboration effort, the City of Somerville will continue to meet with both entities on a monthly or as needed basis to keep each other up to date with regards to system changes that may directly or indirectly impact CSOs.





Sub-Task 2.3 – Development of an Updated Typical Rainfall Year and Extreme Rainfall Events

The City of Somerville will, in collaboration with the MWRA and Cambridge, develop a new Typical Rainfall Year that incorporates more recent historical rain data and serve as the basis to determine the current level of CSO Control as well as the level of control achieved by proposed CSO control alternatives. As part of this effort, Somerville will also select one or several large rainfall events to assess the impact of proposed CSO alternatives to upstream community flooding and sanitary sewer overflows. Potential design storms to be considered are: current 25 year, 24-hour storm event, which is roughly equivalent to the 10-year, 24-hour 2070 event, or short duration, high intensity events such as the 25-year, 1-hour storm.

A proposed methodology for the development of the updated Typical Year has been developed in collaboration with MWRA and Cambridge. The detailed methodology is included in the MWRA *Updated CSO Control Plan – Updated Scope of Work* document, Section 2.2.

Assumptions: Somerville assumes the updated typical year will be developed as a joint effort between Somerville, MWRA, and Cambridge and will be adopted by EPA and MassDEP no later than May 31, 2022.

Sub-Task 2.4 – Determine Current CSO Level of Control with Updated Typical Year

As part of the on-going and planned coordination with Cambridge and MWRA, Somerville will request and integrate the most up-to-date conditions hydraulic models from both entities into the City's model. Somerville's hydraulic model has been developed over the years but has recently been greatly refined as part of the on-going Citywide Drainage and Water Quality Improvements Plan. The model has been developed using Infoworks ICM software, which is the same software used by the MWRA and Cambridge, greatly facilitating their integration. Infoworks ICM is a numerical hydrologic and hydraulic model that allows two-dimensional overland flow, pipe and open-channel hydraulics modeling in one single platform. This software can be used for both analysis of the conveyance system and CSO performance as well as one-dimensional receiving water quality modeling.

Work included in this sub-task includes:

1. Re-calibrating the existing conditions, integrated model, if needed, using permanent flow meters at SOM-001A and other relevant locations as well as MWRA meters SO-3 and MF-SO-2.
2. Running the calibrated, existing conditions model using the updated Typical Rainfall Year.
3. Determining the current level of CSO control at SOM-001A and SOM-007A using the updated Typical Year with respect to current LTCP values.





4. Performing a baseline pollutant load assessment, which will rely on the following metrics:
 - a. Updated Typical Year CSO volumes and activations.
 - b. Bacteria baseline loadings from Somerville to the Alewife Brook and the Upper Mystic River. Somerville will use the hydraulic model and rely on recent sampling performed by the City, the MWRA's post-construction monitoring program, and other relevant sources to assume bacteria concentrations from CSOs and non-CSO sources.
 - c. Baseline phosphorus loading from Somerville to the Alewife Brook and the Upper Mystic River. Somerville will use the land use-based methodology developed by EPA for the NPDES MS4 General Permit and relevant information in the Mystic River Watershed Alternative TMDL for Phosphorus Management to calculate the total phosphorus baseline load from stormwater runoff.
 - d. TSS and other pollutants of concern baseline loadings from Somerville will be estimated using available data that may include land use-based calculations or flow volumes from the hydraulic model and pollutant concentrations from recent sampling events or relevant literature values.

5. Evaluating impacts to the receiving waters. This will be accomplished by:
 - a. Computing receiving waters bacteria concentrations at critical locations of the Alewife and Mystic River for selected storms that cause CSO in the updated typical year. Somerville intends to use the same model used by the MWRA on its water quality assessment developed as part of their post-construction monitoring program.
 - b. Estimating frequency and duration of water quality standards bacteria violations in the updated typical year for the proposed alternatives. Somerville intends to use the same MWRA model for this task.

Assumptions: Somerville will rely on the receiving water quality results reported in the MWRA's Water Quality Assessment from its CSO Post Construction Monitoring and Performance Assessment to the maximum extent possible.





TASK 3. PUBLIC PARTICIPATION PLAN

Public participation is a critical element in the successful implementation of the Somerville CSO Control Plan.

Sub-Task 3.1 Public Participation Plan Goals:

- To promote an ongoing public partnership between the City of Somerville and the community so that CSO mitigation benefits are considered within the context of the communities directly impacted by the Plan.
- To allow for early, frequent, and continuous consultation with the public by committing to public notification of the affected parties and provide opportunities for citizen feedback during development of the identified solutions.
- To assist in building public support for the identification of possible solutions.

This participation plan is intended to establish a public involvement process that is dynamic in nature so that it can evolve with the progress of the CSO Control Plan.

Sub-Task 3.2 Environmental Justice

An important component of the Plan is identifying Environmental Justice populations. The goal of identifying the population in the plan area is to identify Environmental Justice communities so that impacts associated with the Plan are not disproportionately distributed and that public outreach is fair and inclusive.

Based on the Massachusetts 2020 Environmental Justice Populations map, CSO areas subject to the 2019 Variance within the City of Somerville have several block groups that qualify as an EJ population.

The populations in the project area include Spanish, Portuguese, and Creole translation requirements. The City of Somerville will take additional measures to improve public participation of the EJ population, such as making key documents available in other languages such as Spanish, Portuguese, Haitian Creole, and Nepali, providing translation services at public meetings, and holding public meetings in accessible locations near public transportation.



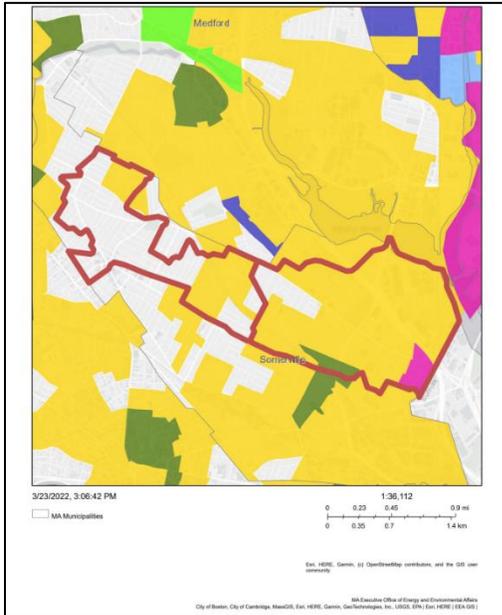


Figure 1. EJ Populations within SOM-001A and SOM-007A tributary areas

- Orange: Minority (The block group minority population is greater than or equal to 40 percent, or the block group minority population is greater than or equal to 25 percent and the median household income of the municipality the block group is in is less than 150 percent of the Massachusetts median household income.)
- Dark Green: Minority and income (At least 25 percent of households have a median household income 65 percent or less than the state median household income.)
- Magenta: Minority and English isolation (25 percent or more of households do not include anyone older than 14 who speaks English very well.)

Sub-Task 3.3 Stakeholder Coordination

Formal meetings and presentations for stakeholders will occur during major tasks in Plan Development or to discuss specific concerns or topics. These meetings will provide Plan information and provide an opportunity for any questions to be addressed. The Project Team will be responsible for maintaining minutes of meetings that clearly document the public outreach efforts. The minutes will identify the issues raised during each outreach session and designate follow-up actions that are required as a result of that session.

The sections below summarize the various stakeholder meetings that will be conducted.

3.3.1 Public Meetings:

- A joint initial public meeting with MWRA, the City of Cambridge, and the City of Somerville will be held in late Spring or Summer 2022 to educate the public on the draft scope and goals.
- A minimum of two more public meetings will be held prior to and during the development of the CSO control alternatives.

Publication in local and regional newspapers and/or other broadcasting platforms of upcoming public meetings will provide an opportunity to the public to prepare for the meeting and relay informed questions to the City of Somerville.





3.3.2 Other Outreach Tools

These include:

- Project Brochure or Fact Sheets
- Social Media posts on the City of Somerville's social media platforms
- The City of Somerville's SomerVoice website

3.3.3 Public Hearing

A public hearing will be held after the distribution of the Draft Recommended Plan and during the review period.

3.3.4 Agency Coordination

The City of Somerville has and will continue to coordinate with state and local agencies over the course of this Plan. The City of Somerville meets with MWRA and City of Cambridge on a regular basis to discuss existing conveyance system conditions and understand impacts on each other's systems. As part of a continued collaboration effort, the City of Somerville will continue to meet with both entities on a monthly or as needed basis in order to keep each other up to date with regards to system changes that may directly or indirectly impact CSOs.

If needed, the City of Somerville will schedule a pre-filing meeting to consult with the MEPA office and identify any potential review thresholds and determine if an Environmental Notification Form (ENF) is needed.





TASK 4. CSO CONTROL ALTERNATIVES ANALYSIS

Based on the current level of CSO Control determined in Task 2, Somerville will evaluate multiple CSO Control alternatives in areas tributary to SOM-001A and SOM-007A to identify interventions that would allow or contribute significantly towards the attainment of water quality standards. These alternatives will be in addition to any other planned interventions by the MWRA or Cambridge in their respective systems that may change the nature and magnitude of interventions required by Somerville to achieve the water quality goals. This will consist of the following sub-tasks.

Sub-Task 4.1 - CSO Control Alternative Development and Analysis

1. Modify existing conditions model to reflect future, planned system interventions by MWRA and Cambridge that may have a direct or indirect impact on activations in Somerville's CSOs.
2. Screening and feasibility evaluation of alternatives that allow or contribute significantly towards the attainment of water quality standards during the updated Typical Year. Screening and evaluation of the following are proposed:
 - a. Nine Minimum Control Measures Evaluation. As indicated in Task 2, the City will evaluate the current degree of implementation of the NMCs. Under this task, the City will evaluate if any changes can be made to the NMCs to further reduce CSOs.
 - b. Elimination of CSOs. Two different general approaches to CSO elimination will be evaluated.
 - i. Upstream sewer separation with green infrastructure implementation in public right-of-way. The City of Somerville will evaluate the impact of eliminating its SOM-001A and SOM-007A CSOs by means of upstream sewer separation and implementing Green Infrastructure as recommended in the Citywide Drainage and Water Quality Plan. It is worth noting that tributary areas to the SOM-001A and SOM-007A CSO regulators are not entirely contained within Somerville and therefore, complete elimination of the CSO may not be possible by sewer separation within Somerville boundaries alone.
 - ii. Upstream sewer separation with an extensive naturalization and modification of the urban environment. Examination of the historical





record regarding flooding and data regarding natural soils indicate that green solutions to eliminate CSOs would require extensive land area. To bracket the screening of options, the City of Somerville will identify the extent of currently developed land that would need to be converted to wetlands or flood-tolerant open space and develop localized stormwater systems in those areas that would be required to eliminate CSOs.

- c. Relocation of CSOs: Somerville will evaluate the potential of relocating the CSOs to areas that may be less sensitive from a water quality and water use standpoint. The City will evaluate CSO relocation opportunities with the goal of maximizing the recovery of designated water uses. Similar to elimination of CSOs, relocation of a CSO would require substantial coordination with neighboring communities and the MWRA as it would potentially impact their systems significantly.
 - d. Other technologies within Somerville (treatment, in-line or off-line storage, passive or real-time system controls etc.). The City of Somerville will evaluate the use of other technologies in addition to or in lieu of elimination and relocation of CSOs. These technologies will target improving system performance and water quality outcomes by different means such as CSO consolidation and treatment, or increasing in-line or off-line storage capacity using passive or real-time controls at critical locations of the collection system.
 - e. Other technologies outside Somerville (i.e. enhancement to MWRA's infrastructure, creation of a large wetland resource in Arlington).
3. CSO mitigation alternatives deemed technically feasible, will be incorporated into the model and will be run with the updated Typical Year to assess alternatives' CSO performance as well as the selected extreme rainfall events.
 4. Provide level of CSO control for the alternatives evaluated (annual activations and volumes)
 5. Evaluate impacts to upstream flooding using the selected extreme rainfall events.
 6. Provide estimated updated stormwater discharge volumes for the alternatives evaluated.
 7. Provide a cost estimate of the alternatives evaluated deemed technically feasible.

Assumptions: Somerville assumes that no more than eight alternatives will be screened for feasibility per CSO area and no more than five will need to be modeled per CSO area.





Sub-Task 4.2 -Receiving Water Quality Impacts of Technically Feasible Alternatives

The goal of any of the proposed alternatives is to attain the water quality standards of the receiving water body. Under this task, Somerville will perform a water quality assessment of the receiving water bodies that will include the impacts of non-CSO discharges, which will become more relevant in cases where sewer separation is being proposed. In order to evaluate the impacts to receiving water quality, the following is proposed:

1. Calculate bacteria, phosphorus and other pollutants of concern loading baseline changes from CSO and stormwater discharges from Somerville to the Alewife Brook and the Upper Mystic River for the proposed alternatives. Somerville will use the hydraulic model and rely on recent sampling performed by the City, the MWRA's post-construction monitoring program, and other relevant sources such as land use-based metrics to compute pollutant loadings.
2. Evaluate the impacts of feasible alternatives to receiving waters. This will be accomplished by:
 - a. Compute receiving waters bacteria concentrations at critical locations of the Alewife and Mystic River for selected storms that cause CSOs in the updated typical year. Somerville intends to use the same model used by the MWRA on its water quality assessment developed as part of their post-construction monitoring program.
 - b. Estimate frequency and duration of water quality standards bacteria violations in the updated typical year for the proposed, feasible alternatives. Somerville intends to use the same MWRA model for this task.
 - c. Compare changes in loadings of phosphorus and other pollutants of concern with respect to the baseline conditions. These updated loadings will be compared to those recommended to meet applicable water quality standards as established in reference documents such as the Mystic River Watershed Alternative TMDL for Phosphorus Management.

Somerville will coordinate with MWRA and Cambridge in the documentation of results from the receiving water quality analysis and potentially submit information to MassDEP to support a Use Attainability Analysis, if needed.





Assumptions: Somerville assumes that no more than five alternatives will need to be modeled per CSO area.

Sub-Task 4.3 - Cost/Benefit Evaluation of Technically Feasible Alternatives: Affordability Analysis

Under this task, the City of Somerville will perform a cost-benefit analysis of the proposed alternatives that were deemed technically feasible and allow or contribute significantly towards the attainment of receiving water quality standards for bacteria, phosphorus and other pollutants of concern. Somerville will provide project implementation cost estimates for these alternatives, which will be calculated using Engineering best practices and judgment. Somerville will then develop cost-benefit metrics for these projects to be able to objectively compare and rank them. These metrics will reflect the impacts on water quality and impacts on sensitive use areas relative to the project costs.

For the top alternatives in each CSO area, with the most favorable cost-benefit metrics, Somerville will perform an affordability analysis using EPA's guidance and framework in the 2014 Memorandum on Financial Capability Assessment Framework for Municipal Clean Water Act Requirements.

The affordability analysis will provide valuable information and insight as to which of the proposed alternatives are feasible from a financial standpoint and understand the impacts to Somerville's rate payers.

Assumptions: Somerville assumes the top three alternatives from a cost-benefit prospective will undergo the affordability analysis.

Sub-Task 4.4 -Alternative Selection and Development of an O&M Plan, Implementation Schedule, and Post-Construction Monitoring Plan

The cost-benefit analysis and affordability analysis in Task 4.3 will undergo public review and will be shared and coordinated with the MWRA and Cambridge. The input from this process will then inform the selection of the best alternative per CSO area (one for SOM-001A and one for SOM-007A).

For the selected alternatives, the City will then develop an implementation schedule and create an O&M plan, if needed, as well as a monitoring program to ascertain the effectiveness of the selected CSO controls.





TASK 5. DEVELOPMENT OF THE DRAFT AND FINAL CSO PLAN

The City of Somerville will generate a Draft and Final CSO Control Recommended Plan that allows compliance with the Clean Water Act Federal Water Quality Standards 40 CFR 131 and Massachusetts Water Quality Standards 314CMR 4.00. The Draft CSO Control Recommended Plan will be based on the information gathered and the decisions made through the CSO alternative selection and public engagement process described above. The Draft CSO Control Recommended Plan will be submitted to MassDEP and EPA for review no later than June 30, 2023. Upon review from MassDEP and EPA, Somerville will generate a Final CSO Control Recommended Plan that will address comments received. The Final CSO Control Plan will be submitted no later than December 31, 2023.

Assumptions: Somerville assumes that EPA and MassDEP review of the draft CSO Control Plan will take no longer than three months to allow enough time to address comments received.





PROPOSED SCHEDULE

Somerville CSO Control Plan Development Proposed Schedule	2022												2023											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Task 1. Review of Public Health Impacts and Regulatory Environment																								
Task 2. Evaluation of Existing CSO Control Levels																								
<i>Sub-Task 2.1 - Current Degree of Implementation of NMCM</i>																								
<i>Sub-Task 2.2 Coordination with Cambridge and MWRA*</i>																								
<i>Sub-Task 2.3 - Development of the Updated Typical Rainfall Year and Extreme Rainfall Events</i>																								
<i>Sub-Task 2.4 - Determine CSO Level of Control with Updated Hydraulic Model</i>																								
Task 3 -Development of a Public participation Plan																								
<i>Draft Public Participation Plan Development</i>																								
<i>MassDEP and EPA Review Period</i>																								
<i>Final Public Participation Plan Development</i>																								
Task 4 - CSO Control Alternatives Analysis																								
<i>Joint Somerville, Cambridge, MAWRA Kickoff Public Meeting</i>																								
<i>Sub-Task 4.1 - CSO Control Alternative Development and Analysis</i>																								
<i>Sub-Task 4.2 - Receiving Water Quality Impacts of Technically Feasible Alternatives</i>																								
<i>Sub-Task 4.3 - Cost/Benefit Analysis of Technically Feasible Alternatives</i>																								
<i>Cost-Benefit Evaluation of Projects</i>																								
<i>Public Participation and Input</i>																								
<i>Affordability Analysis of Top Projects</i>																								
<i>Sub-Task 4.4 - Alternative Selection, O&M Plan, Schedule and Monitoring Plan Development</i>																								
<i>Public review and coordinatio with Cambridge and MWRA</i>																								
<i>Develop implementation schedule, O&M Plan, and monitoring plan</i>																								
<i>Public Outreach to Present Alternative Selection Results</i>																								
Task 5 -Development of CSO Control Plan																								
<i>Draft CSO Control Plan</i>																								
<i>MassDEP and EPA Review Period</i>																								
<i>Public Hearing</i>																								
<i>Final CSO Control Plan</i>																								
<i>* Monthly coordination meetings will be held throughout the duration of the CSO Control Plan development</i>																								

