Massachusetts Water Resources Authority

MWRA Long-Term CSO Control Plan Performance Objectives

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Operations/Engineering & Construction

Wastewater Advisory Committee
February 2, 2018

Remaining Court and Regulatory Obligations

Remaining Federal Court Milestones

Jan 2018: Commence 3-year CSO post-construction monitoring and performance assessment. Conduct in accordance with EPA's Combined Sewer Overflow (CSO) Policy.

Dec 2020: Submit results of 3-year performance assessment to EPA and DEP demonstrating compliance with the levels of control, including frequency of CSO activation and volume of discharge specified in the Long-Term CSO Control Plan.

Remaining Federal/State Regulatory Obligations

- Demonstrate compliance with Mass. Water Quality Standards.
- Support the designation of Long-Term Water Quality Standards for Charles River and Alewife Brook/Upper Mystic River.

Federal Court Requirements for CSO Control

Close 34 of the 84 CSO outfalls.

- ✓ All 34 outfalls – and 5 additional outfalls – are closed.

Provide 25-year storm control at the 5 outfalls along the South Boston beaches.

- ✓ The South Boston CSO storage tunnel provides 5-year storm control for separate stormwater and 25-year storm control for CSO.

Reduce annual (Typical Year) discharge frequency and volume to court-mandated levels at each of the 45 outfalls that remain active.

- ✓ MWRA's CSO plan is fully implemented. Ongoing 3-year performance assessment is intended to verify compliance through overflow metering and updated hydraulic modeling.

OUTFALL	TYPICAL YEAR	
	ACTIVATION FREQUENCY	VOLUME (MG)
ALEWIFE BROOK		
CAM001	5	0.19
CAM002	4	0.69
MWR003	5	0.98
CAM004	Closed	-
CAM400	Closed	-
CAM401A	5	1.61
CAM401B	7	2.15
SOM001A	3	1.67
SOM001	Closed	-
SOM002A	Closed	-
SOM003	Closed	-
SOM004	Closed	-
TOTAL		7.29
UPPER INNER HARBOR		
BOS009	5	0.59
BOS010	4	0.72
BOS012	5	0.72
BOS019	2	0.58
BOS050	Closed	-
BOS052	Closed	-
BOS057	1	0.43
BOS058	Closed	-
BOS060	0	0.00
MWR203 (Prison Point)	17	243.00
TOTAL		246.04
NORTH DORCHESTER BAY		
BOS081	0 / 25 year	-
BOS082	0 / 25 year	-
BOS083	0 / 25 year	-
BOS084	0 / 25 year	-
BOS085	0 / 25 year	-
BOS086	0 / 25 year	-
BOS087	0 / 25 year	-
TOTAL		0.00
SOUTH DORCHESTER BAY		
BOS088	Closed	-
BOS089 (Fox Point)	Closed	-
BOS090 (Commercial Point)	Closed	-
TOTAL		0.00

30 Years of CSO Control

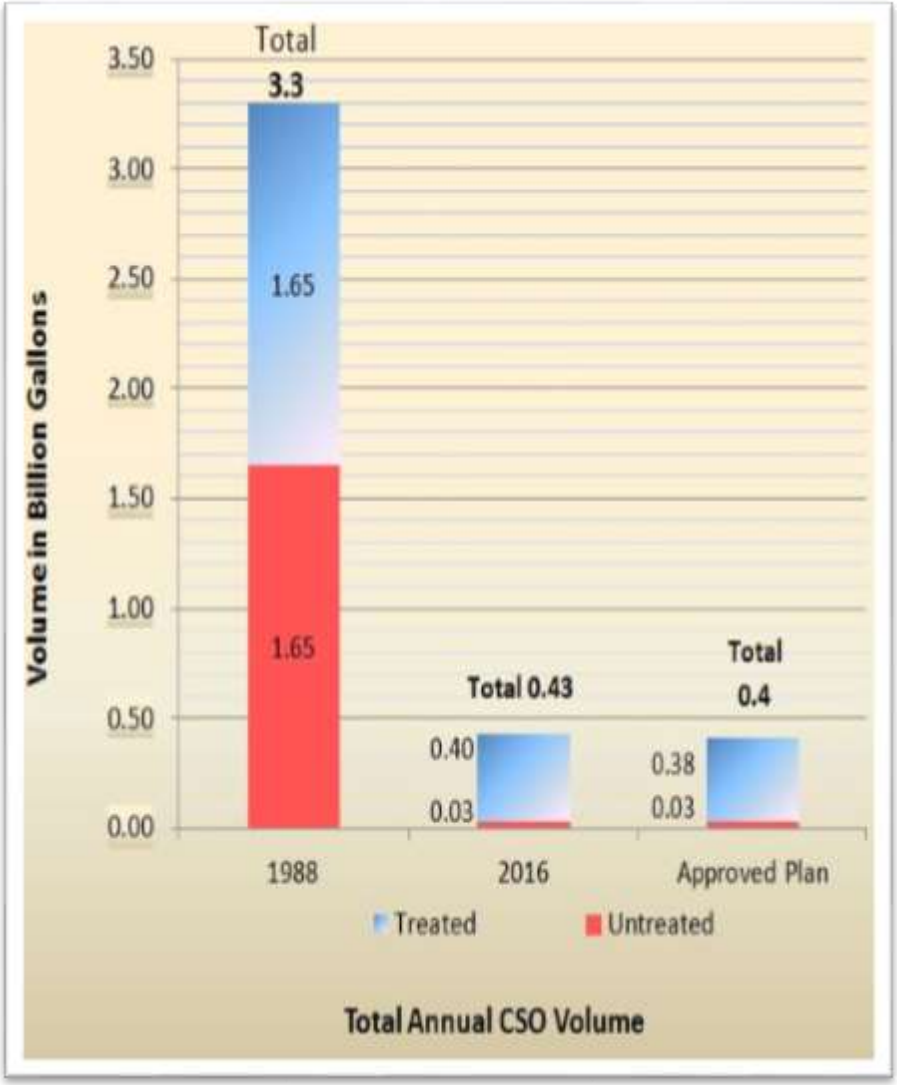
CSO Reduction 1988 to 2020

Long-Term CSO Control Plan Benefits

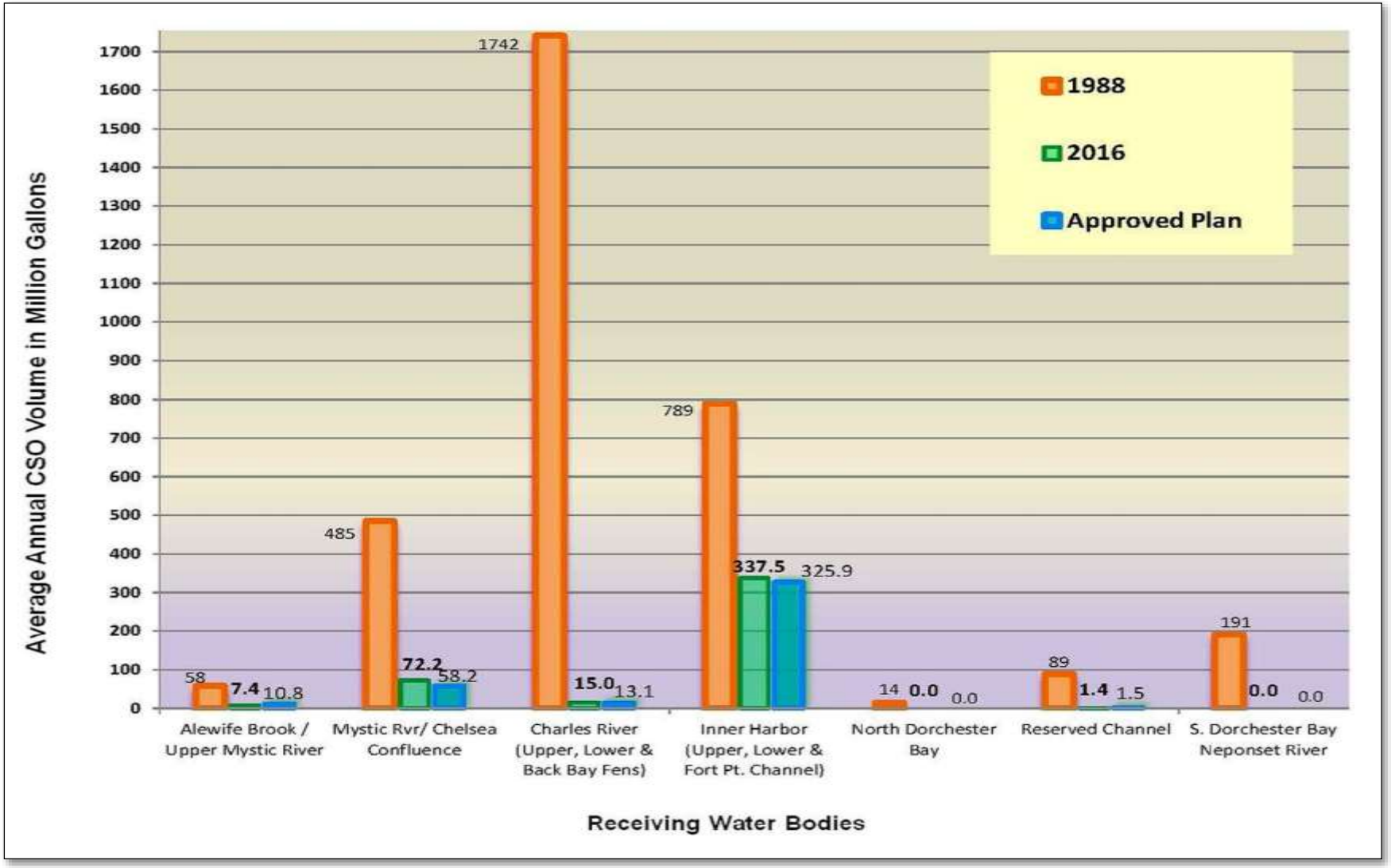
The LTCP brings 84 CSO outfalls into compliance with the Clean Water Act.

- 34 CSO outfalls are now closed.
- 5 outfalls along the South Boston beaches have 25-year storm level of control.
- 5 outfalls have upgraded wet weather treatment at CSO facilities.
- Discharge frequency and volume are greatly reduced at the remaining outfalls.

Reduces system-wide CSO discharge volume in a Typical Rainfall Year by 88%, with 93% of remaining volume treated at MWRA's CSO facilities.



CSO Reduction by Receiving Water



Water Quality Standards Compliance

Water Quality Standard Classification	Receiving Water Segment	Required Level of CSO Control
Class B	Neponset River	CSO prohibited/eliminated (25-year storm control for North Dorchester Bay's South Boston beaches)
Class SB	North Dorchester Bay South Dorchester Bay Constitution Beach	
Class Bcso	Back Bay Fens (Muddy River)	>95% compliance with Class B or SB Must meet court-ordered level of control for CSO activation and frequency in approved Long-Term Control Plan
Class SBcso	Mystic/Chelsea Rivers Confluence Upper and Lower Boston Inner Harbor Fort Point Channel Reserved Channel	
Class B (CSO Variance)	Alewife Brook and Upper Mystic River Charles River	Class B standards sustained w/temporary authorizations for CSO discharges as the LTCP is implemented and verified (1998-2020)

MWRA intends to show that its CSO control plan complies with Water Quality Standards, which for Class B/SB and Class B(cso)/SB(cso) means, 1) attainment of court-mandated levels of control, and 2) confirmation that these levels of control achieve the recommended and approved level of compliance with Class B/SB standards (100% compliance in sensitive waters (beaches/shellfish beds) and 98% or greater compliance in less sensitive waters. For CSO variance waters, court-ordered levels of control are considered temporary and minimum, until DEP makes long-term standards determinations.

Massachusetts Water Resources Authority

CSO Post-Construction Monitoring and Performance Assessment

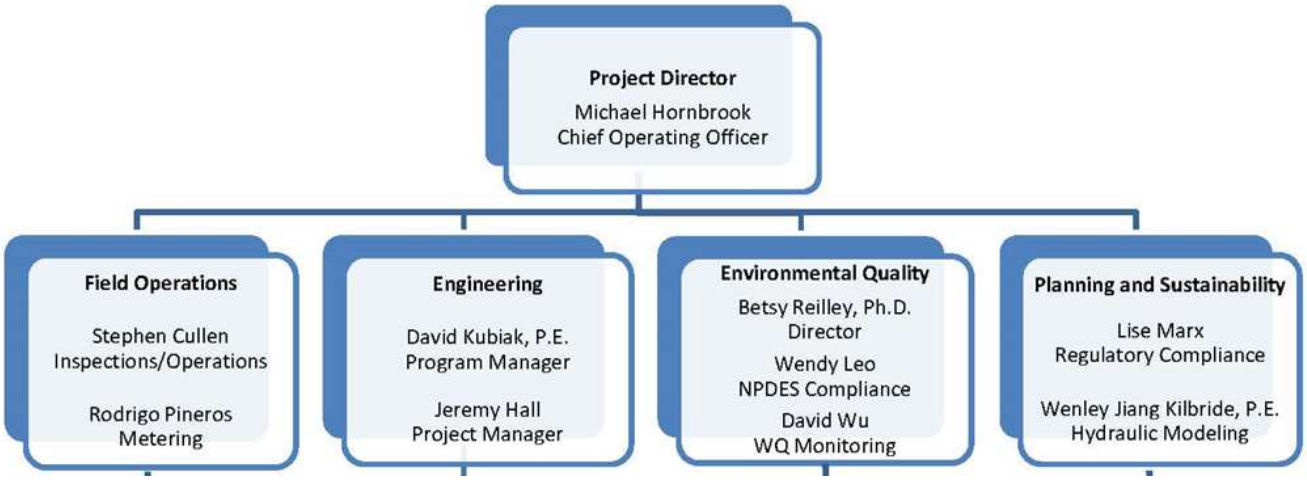
MWRA Contract 7572

Jeremy R. Hall, Project Manager
Operations/Engineering & Construction

Wastewater Advisory Committee
February 2, 2018

Compliance with National CSO Policy

- Review EPA CSO Post Construction Compliance Monitoring Guidance document
- Regularly meet with and gain input from MWRA Project Team



- Submit Scope of Work to DEP (May 1, 2017)
- Develop Professional Services Scope RFQ/P

Contract 7572

Contract Name:	**CSO Post-Construction Monitoring and Performance Assessment**
Scope:	**CSO Inspections, Metering, Hydraulic Modeling, Water Quality Data Analyses, and System Performance Assessments**
Consultant Team:	***AECOM Technical Services, Inc.*** ***ADS Environmental Services*** ***SDE Civil and Environmental Engineering***
Contract Value:	**$2,924,295**
Notice to Proceed:	**November 8, 2017**
Term:	**Thru March 2021**

CSO Assessment Schedule

Consultant contract NTP:	Nov 2017
Initial meetings with CSO Communities	Dec 2017
CSO regulator/system inspections:	Jan 2018 – Mar 2018
Flow meter installation/data collection:	Apr 2018 – Jun 2020
Model calibration:	2018
Semiannual discharge reports:	Sep 2018 – Sep 2020
Receiving water quality analyses:	Nov 2017 – April 2020
Final system assessment report:	Dec 2020
Final receiving water quality report:	Dec 2020

CSO Communities

CSO Community Meetings

- Share information
- Discuss community's metering program
- Gain access to community meter data
- Discuss metering plans
- Discuss ongoing community sewer system improvements

City of Somerville

THE WORKS CAMBRIDGE DEPARTMENT OF PUBLIC

Boston Water and Sewer Commission

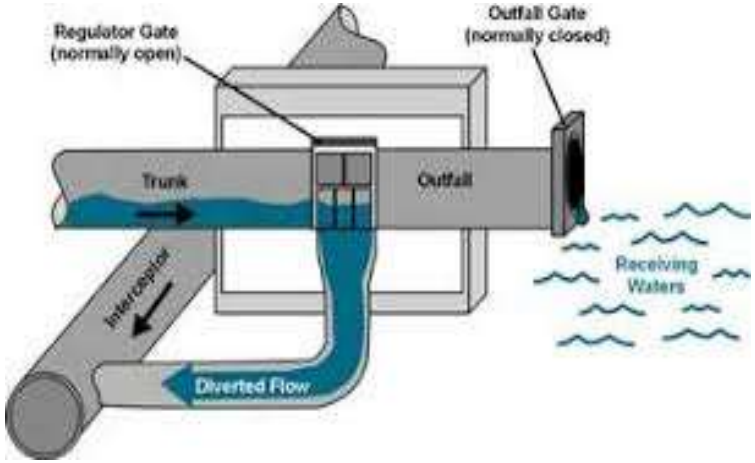
CITY OF CHELSEA MASSACHUSETTS

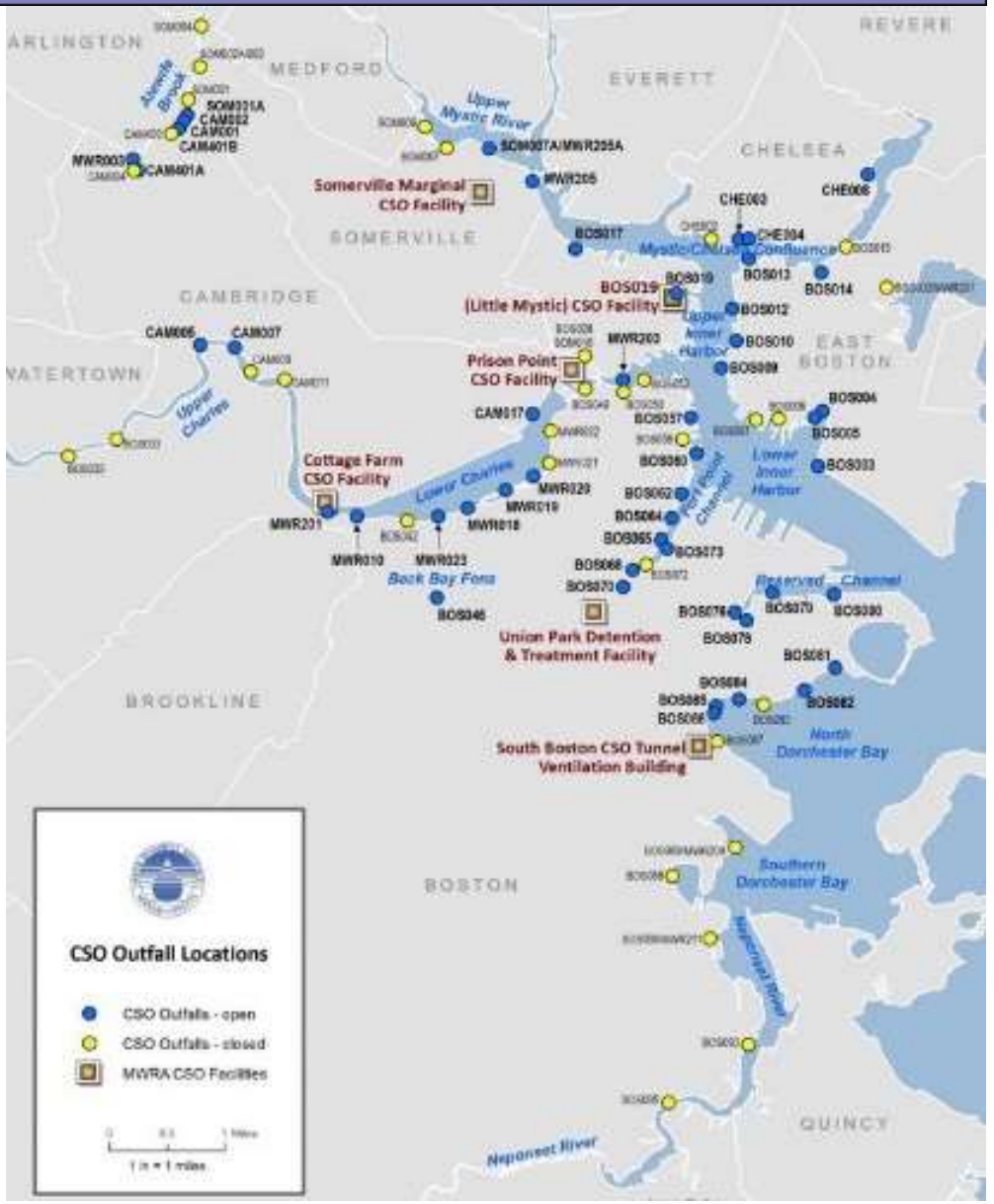
Regulator/System Inspections

Conduct inspections at all active and closed CSO regulators.

- 148 surface inspections

- 77 confined space entries





CSO Metering Plan

16 CSO regulators are currently metered by MWRA or a CSO community

32 Temporary metering sites will be added for the assessment

MWRA's consultant will:

- Finalize the metering approach and plan at active regulators
- Install and maintain temporary meters
- Collect and utilize data from existing MWRA and community meters and the temporary meters
- Continuously assess the metering approach at each regulator to ensure good data and reasonable CSO discharge quantification

CSO Metering

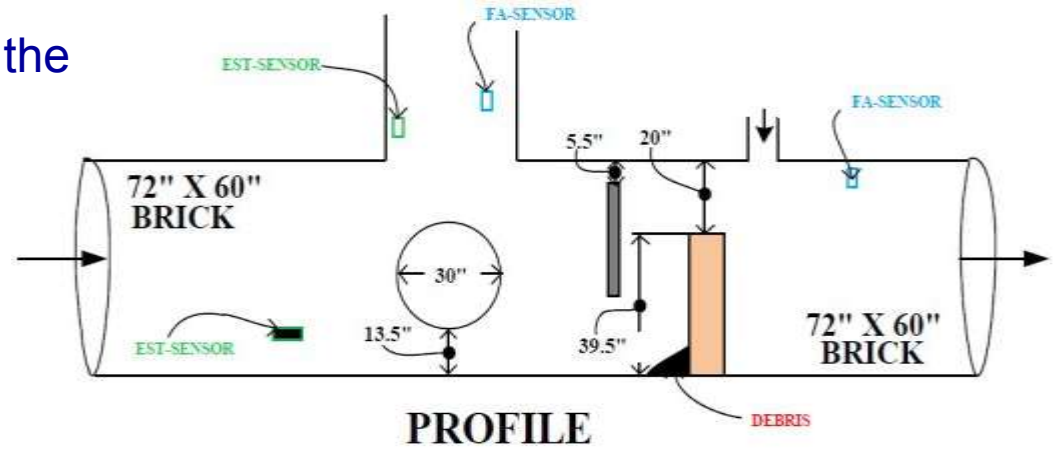
Collect and verify overflow data.

- Existing MWRA and community meters
- Temporary meters installed and maintained by the consultant

Quantify CSO discharges from the data (field-measured).

Validate field-measured CSO discharges.

- Compare to modeled prediction.
- Correlate to rainfall.
- Correlate to system conditions.

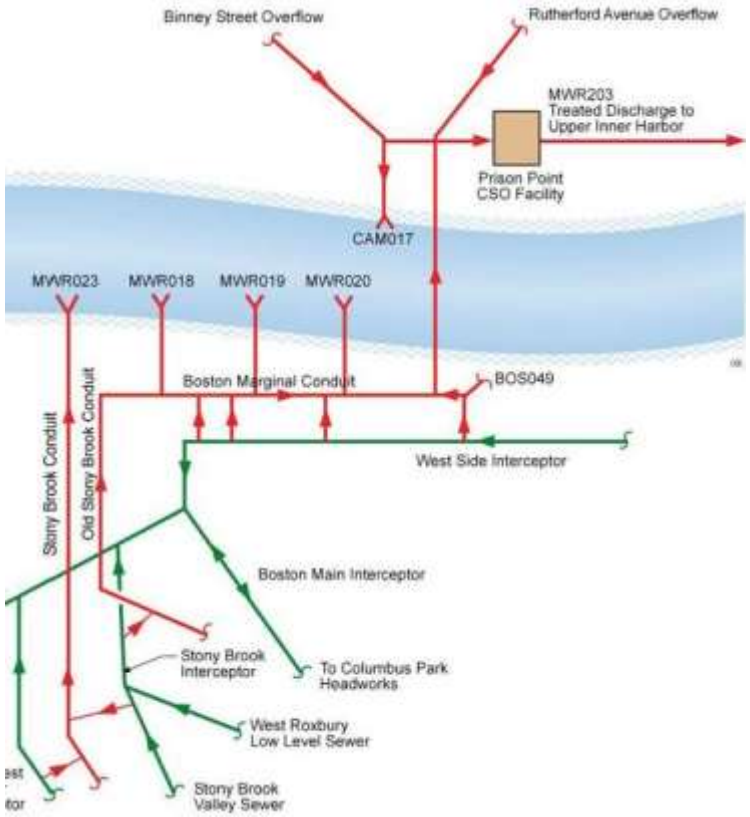


Use field-measured discharges to improve the calibration of MWRA's hydraulic model and, along with model results, evaluate system performance and support water quality impact assessments.

Hydraulic Model

MWRA's consultant will:

- Update the model as new information about system conditions is obtained
- Improve model calibration
- Verify model predictions against validated meter data and field-measured discharges
- Perform storm simulations (all storms)
- Perform Typical Year simulations to verify compliance with LTCP levels of control



Key Performance Assessment Products

- Semiannual CSO Discharge Reports, including:
  - Progress update
  - CSO discharge estimates (metered and modeled)
  - System changes/model updates
  - Updated Typical Year performance vs. LTCP
  - Rainfall analyses

TABLE 10. SUMMARY OF 2016 AND TYPICAL YEAR MODEL SIMULATION RESULTS, AND COMPARISON TO TYPICAL YEAR LONG TERM CSO CONTROL PLAN

	2016 RAINFALL UNDER 2016 SYSTEM CONDITIONS			TYPICAL-YEAR RAINFALL UNDER 2016 SYSTEM CONDITIONS		TYPICAL-YEAR RAINFALL W/ LONG TERM CSO CONTROL PLAN	
Outfall	Activation Frequency	Duration (hrs)	Volume (MG)	Activation Frequency	Volume (MG)	Activation Frequency	Volume (MG)
ALEWIFE BROOK							
CAM001	0	0.00	0.00	1	0.03	5	0.19
CAM002	1	0.71	0.03	1	0.22	4	0.69
MWR003	1	0.96	0.06	2	0.48	5	0.98
CAM004	Closed	N/A	N/A	Closed	N/A	Closed	N/A
CAM400	Closed	N/A	N/A	Closed	N/A	Closed	N/A
CAM401A	1	0.97	0.08	2	0.49	5	1.61
CAM401B	1	0.96	0.05	2	0.21	7	2.15
SOM001A	1	1.49	1.08	5	4.00	3	1.67
SOM001	Closed	N/A	N/A	Closed	N/A	Closed	N/A
SOM002A	Closed	N/A	N/A	Closed	N/A	Closed	N/A
SOM003	Closed	N/A	N/A	Closed	N/A	Closed	N/A
SOM004	Closed	N/A	N/A	Closed	N/A	Closed	N/A
TOTAL		5.09	1.30		5.43		7.29

- Annual Water Quality Summary Reports (July 15)

Receiving Water Quality Assessments

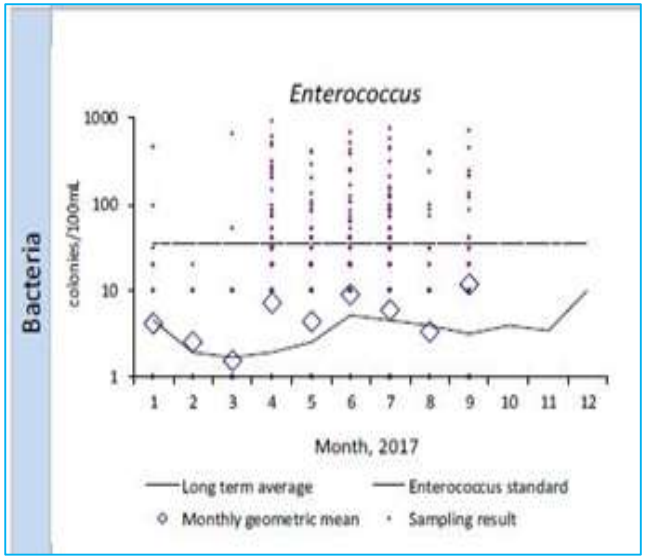
MWRA staff will continue to collect and test receiving water samples, with emphasis on the Charles and Alewife/Mystic.

Consultant will perform statistical analyses of MWRA data to evaluate/characterize water quality conditions and remaining CSO impacts.

What are the CSO water quality impacts relative to other pollution sources, including urban stormwater and upstream river loadings?

Do CSO discharges affect water quality recovery time?

How many total hours per year (in Typical Year) do CSOs contribute to violations of Class B or SB bacteria standards?



Public Information/Progress Communication

Semiannual Court Reports (June 15 and December 15)

Semiannual CSO Discharge Reports (April and October)

Annual Water Quality Summary Reports (July 15)

Annual Regulatory/Public Briefings

MWRA CSO Performance Assessment

QUESTIONS?