

**2015 Annual Report
National Pollutant Discharge Elimination System**

FOR THE

CITY OF CAMBRIDGE, MASSACHUSETTS
COMBINED SEWER OVERFLOW PERMIT
#MA0101974

April 2016

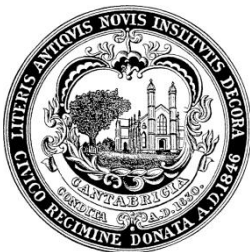
Submitted to:

U.S. Environmental Protection Agency
Water Technical Unit

MA Department of Environmental Protection
Bureau of Resource Protection

Submitted by:

City of Cambridge
Department of Public Works



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Signature of Authorized Official: Richard Rossi
City Manager, City of Cambridge



Date

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1.0 Purpose of Report

This report has been prepared in accordance with Part I, Section D of Permit No. MA0101974, issued to the City of Cambridge Department of Public Works on September 30, 2009. The permit authorizes the City of Cambridge to discharge flow from twelve (12) Combined Sewer Overflows (CSO) located in eleven (11) regulator structures to the receiving water bodies named in the permit.

The City of Cambridge is additionally required to provide a comparison between the precipitation for the year and the precipitation of the typical year under future planned conditions in the MWRA Final CSO Facilities Plan or “Notice of Project Change:” document. The comparison shall include the number of events and the size of events (including recurrence interval). Also required for each CSO is a comparison between the activation volume and frequency for the year and the volume and frequency during a typical year under future planned conditions. Finally, an evaluation of whether the CSO activation volumes and frequencies for the year are in accordance with the estimate in the MWRA Final CSO Facilities Plan or the report entitled “Notice of Project Change for the Long Term CSO Control Plan for Alewife Brook”, given the precipitation which occurred during the year, and the CSO abatement activities which have been implemented. Where CSO discharges are determined to be greater than the activation frequency or volume in either document, an assessment of the results shall be completed and documented. A discussion of remaining CSO abatement activities and an assessment of the impact of those projects on attaining the level of CSO control identified in the relevant document or any amendments.

2.0 Combined Sewer Overflow Monitoring Plan

As part of the Year 1 Annual Report, the City revised weir equations for use in estimating combined sewer overflow quantities at the various regulators. During Year 2 (2010), the City further refined these results using model simulations where CSO activations are impacted by the river systems. For Year 3 (2011), Year 5 (2013) and year 7 (2015), the City continued to refine the results using model simulations of rainfall from the typical year and the current year to help determine the course of action for the CSO regulating structures.

Section 2.1 describes the existing methodology by which the City estimates effluent volumes and characterizes CSO events. Section 2.2 presents data from the calendar year of 2015 based on this approach, and Section 2.3 describes recommended enhancements and reporting methodology to be utilized by the City going forward.

2.1 Existing CSO Monitoring Methodology

As part of the City’s current NPDES Permit, the Department of Public Works (DPW) monitors flow weirs within combined sewer overflow regulator structures to estimate CSO discharge to the Charles River and Alewife Brook. Currently, there are 12 permitted CSO locations associated with 11 CSO regulator structures.

Table 2.1
Summary of Combined Sewer Locations

Regulator Structure	CSO Location	Locus	Statuses
CAM 001	CAM 001	Alewife Brook Parkway	Open
CAM 002	CAM 002A	Massachusetts Ave. at Alewife Brook Parkway	Open
	CAM 002B ³	Massachusetts Ave. at Alewife Brook Parkway	Closed
CAM 004 ¹	CAM 004	Fresh Pond Rotary	Open/Closed ¹
CAM 400	CAM 400	Alewife Brook Parkway and Harrison Avenue	Closed ²
CAM 401A	CAM 401A	Bellis Circle/Sherman Street	Open
CAM 401B	CAM 401B	Massachusetts Ave. at Alewife Brook Parkway	Open
CAM 005	CAM 005	Mount Auburn Hospital	Open
CAM 007	CAM 007	Memorial Drive at Hawthorne Street	Open
CAM 009	CAM 009	Memorial Dr. at Old Murray Rd.	Closed ³
CAM 011	CAM 011	Plympton St.	Closed ³
CAM 017	CAM 017	Binney Street at First Street	Open

¹ Permanently closed December 27, 2015

² Permanently closed on March 31, 2011

³ City retains the right to re-open once a hydraulic study is completed

Metering is typically performed by measuring the depth of flow in the structure and computing discharge using a weir equation. In addition, CAM 002A and CAM 005 have secondary area and velocity flow measuring devices in place at the CSO outfall pipe to accurately determine the CSO overflow discharge.

Weir Equation: Currently the City uses the following rectangular contracted weir equation as provided by the flow meter manufacturer to compute flow over a standard weir:

$$Q = K(l - 0.2h)h^{1.5}$$

Where:

Q is flow measured in cubic feet per second (CFS)

l is the weir crest length in feet

K is the weir coefficient equal to 3.330, when $1 \leq l \leq 10$ feet

h is the head on the weir in feet, the limits of which vary according to l as follows:

<u>Weir Length l (ft.)</u>	<u>h minimum (ft.)</u>	<u>h maximum (ft.)</u>
1	0.2	0.5
1.5	0.2	0.75
2	0.2	1.0
2.5	0.2	1.25
3	0.2	1.5
4	0.2	2.0
5	0.2	2.5
6	0.2	3.0
8	0.2	4.0
10	0.2	4.5

The CSO regulator weir crest lengths as reported under existing conditions are:

<u>Location</u>	<u>Weir Length (ft.)</u>
CAM 001 (Alewife Brook Pkwy)	1.46
CAM 002A (Massachusetts Ave at Alewife Brook Pkwy)	5.00
CAM 004 (Fresh Pond Rotary)	7.50
CAM 401A (Bellis Circle at Sherman Street)	19.96
CAM 401B (Massachusetts Ave at Alewife Brook Pkwy)	6.00
CAM 005 (Mount Auburn Hospital)	3.94
CAM 007 (Memorial Drive at Hawthorne Street)	6.29
CAM 017 (Binney Street at First Street)	24.00

The summary of CSO activations for 2015, which follows is based on activation and quantification results based on weir equations, flow measuring devices and modeling software (Infoworks) in use during 2015.

2.2 Summary of 2015 CSO Activations

Activation Frequency and Discharge Volumes

Based on the monitoring procedures described above, four (4) total activations occurred at Charles River CSO regulators during four (4) separate storm events. Thirty-three (33) total activations occurred at Alewife Brook CSO regulators during fifteen (15) separate storm events. A summary of 2015 activations are provided in Table 2.2 and 2.3 for the Charles River and Alewife Brook, respectively.

Precipitation data for each day of the 2015 reporting period is provided in monthly tables in **Appendix I**. In conformance with permit requirements under Part 1, Section D, Paragraph 2, data is provided for each day, including total rainfall, peak intensity, and average intensity. The monthly CSO volume data sheets are provided in **Appendix II**.

**Table 2.2
Summary of 2015 Activations
Charles River CSOs**

Receiving Water	Outfall No.	Discharge Location	2015 Activation Frequency	2015 Activation Volume (million gallons)
Charles River	CAM005	Lowell St. @ Mt. Auburn St.	1	0.19
	CAM007	Memorial Dr. @ Hawthorne St.	1	0.03
	CAM009	Memorial Dr. @ Old Murray Rd.	*	n/a
	CAM011	Plympton St.	*	n/a
	CAM017	Edwin Land Blvd. @ Binney St.	1	1.83
	TOTAL			
* CAM009 and CAM011 are temporarily blocked				

Table 2.3
Summary of 2015 Activations
Alewife Brook CSOs

Receiving Water	Outfall No.	Discharge Location	2015 Activation Frequency	2015 Activation Volume (million gallons)
Alewife Brook	CAM001	Foch St. @ Alewife Brook Pkwy.	1	.001
	CAM002A CAM002B ¹	Mass Ave. @ Alewife Brook Pkwy	3	2.26
	CAM004 ²	Concord Ave. Rotary @ Fresh Pond Pkwy	6	14.60
	CAM400 ²	Harrison Ave. @ Alewife Brook Pkwy	0	0.00
	CAM401A	Sherman St. @ B&M Railroad	1	1.23
	CAM401B	Mass Ave./Columbus Ave. @ Alewife Brook Pkwy	1	0.34
	TOTAL			
¹ CAM002B is temporarily closed. ² CAM400 closed on March 31, 2011. ³ Permanently closed December 27, 2015				

2.3 Modifications to CSO Monitoring Plan

The purpose of this analysis is to evaluate the current monitoring plan and to improve upon it, if possible, by modifying the present metering approach, improving CSO activation reporting under the current NPDES permit.

CSO Regulator Structures

The methodology used to calculate overflows at each regulator structure has been reviewed and evaluated as described below. Where appropriate, revisions to existing calculation methodology are proposed. In addition, calculations will continue to be updated based on field investigations in order to reflect current field conditions.

CAM 001

The permitted configuration for CAM 001 consisted of an 18” overflow pipe with a steel plate at the end. The plate covered the bottom portion of the 18” pipe. The top of the steel plate was 5-3/4 inches below the crown of the 18” pipe. This created a restricted 70.6 square inch opening with an overflow elevation of 15.22 Feet (NGVD).

The final configuration for CAM 001 consists of a 10” PVC pipe outlet with a 15” PVC elbow for floatable controls. There is also a brick weir set as elevation 15.22 Feet (NGVD).

Hydraulic backwater computations on both the permitted configuration based on the 18” pipe and on the modified configuration using the brick weir with the 10” pipe were performed. The analysis indicates that for flows up to four (4) CFS, the performances of the two (2) configurations are almost identical. For flows through the outfall pipe slightly greater than four (4) CFS, the hydraulic grade line will be greater than the rim elevation of the manholes and combined sewage will escape the sewer system and flow overland to the Brook, however this situation has not been observed in any combined sewer event. To determine the possibility of the structure being over topped a 100-year rain storm was run through the hydraulic model and showed that a flow over 10 cfs will remain approximately 1.0-foot below the rim elevation of the CAM 001.

CAM 002A

A standard weir equation was used to calculate the CSO activation volume for each storm.

$$Q = 3.33*(L-0.2*h)*(h)^{1.5}$$

The above formula will be used to calculate overflow volumes for all flows below 2.5-feet above the weir elevation of 17.3-ft (CCB). Beyond that, Infoworks will be used to calculate all flows.

CAM 004 (Closed December 27th, 2015)

This CSO is located within a drainage confluence structure called Drain Vault 5 within the Alewife Brook Rotary at the junction of Concord Avenue and The Alewife Brook Parkway. The weir structure within this CSO is a complex weir with the lowest weir having a length of 7.5 ft and being perpendicular to the direction of flow, the two higher weirs are aligned parallel to the direction of flow and are eight (8) inches higher with a total weir length of an additional seventeen (17) feet.

After reviewing the data from the storms that occurred in 2011, the current multi-step weir equation was considered no longer valid. Instead, an Infoworks calibrated model was used to calculate the total amount of CSO’s that occurred at this structure. River elevations for the year are taken from a meter that was located inside of CAM 400 and translated to the outfall of CAM 004. The weir structure was modified to be two (2) separate weirs as described above. The heights or “h” values that were calculated by Infoworks were consistent with “h” values that the flow meter was reading.

CAM 004 was closed on December 27, 2015 as part of a multiyear construction project.

CAM 400 (Closed March 31, 2011)

The downstream combined sewer system for CAM 400 was under construction as part of common manhole separation project (Contract 13) for part of the year (2012). This construction consisted of laying new storm sewer and sanitary sewer mains and separating common manholes. The work was completed in March 2011 and the CAM 400 CSO regulator was closed.

CAM 401A

Due to the complicated nature of this structure and the existing floatables control brush screen at the existing weir, an alternative weir equation was used for comparison to the standard equation. This configuration requires a weir coefficient of $K = 2.4$ (based on information from the brush screen manufacturer) to replace the standard weir equation coefficient of 3.33. Consequently the equation used for this CSO structure overflow was:

$$Q = 2.4*(L-0.2*h)*(h)^{1.5}$$

The City will use this revised weir equation for future flow estimates. It should be noted that similar to other CSOs, this system will experience a backwater effect above the weir elevation for the 25-year storm event and above and will be subject to additional analysis when submitting annual reports.

CAM 401B

Due to the size of the outlet, a rectangular weir will be used up to an elevation of 1.4 feet above the bottom of the invert and an orifice equation will be used for all flows above 1.4 feet.

Rectangular Weir

$$Q = 3.33*(L-0.2*h)*(h)^{1.5}$$

Orifice Equation

$$Q = A*C_v*\sqrt{2*g*h_o}$$

The Infoworks modeling software will also be used to better understand the flows from the CSO regulator structure.

CAM 005

An area / velocity meter has been installed in the downstream overflow pipe, and it will continue to authenticate CSO overflows from the CAM 005 regulator instead of relying solely on the weir equations or model output. To determine flow values for CAM 005 the velocity

meter and flow meter data was reviewed. When the velocities were positive a standard rectangular weir equation was used.

CAM 007

The standard weir equation is accurate in this scenario, and the City will continue to use this existing equation for flow approximation purposes.

CAM 007 has experienced significant inflow from the Charles River. The inflow typically does not affect the CSO outfall however several events have been recorded with a CSO event being interfered by inflow.

CAM 017

The reconstruction of CAM017 has recently been completed. The new structure consists of 3 bending weirs that will allow flow to enter the Charles River once a certain elevation is achieved.

Due to the complexity of the bending weirs, flow conditions, and downstream and upstream conditions a standard weir equation is not adequate. Once an overflow has been detected a series of weir equations will be run based on the degree of rotation of the bending weir and elevation and velocity of the water. The rotation of the bending weir will be measured by a rotational meter and the elevation of the system will be measured by a depth probe. The bending weirs and associated equations will be validated once activation occurs. The results will be cross checked with the current Infoworks model to ensure that the overflow was properly detected.

2.4 Rainfall Characteristics

Under the City of Cambridge Combined Sewer Overflow Permit MA0101974, an analysis of precipitation for the previous year against the typical year should be performed in the 2015 CSO NPDES Annual Report.

The City of Cambridge has three (3) active rain gauges located throughout the City. Two (2) meters are located near Fresh Pond. These gauges are the USGS gauge (USGS) at Fresh Pond and the Cambridge Water Department (CWD) Gauge. The gauge located on the Water Department, is a seasonal rain gauge. This data does not constitute a full year and is not considered valid when comparing to the typical year. The gauge at the Muddy River is used as a second gauge.

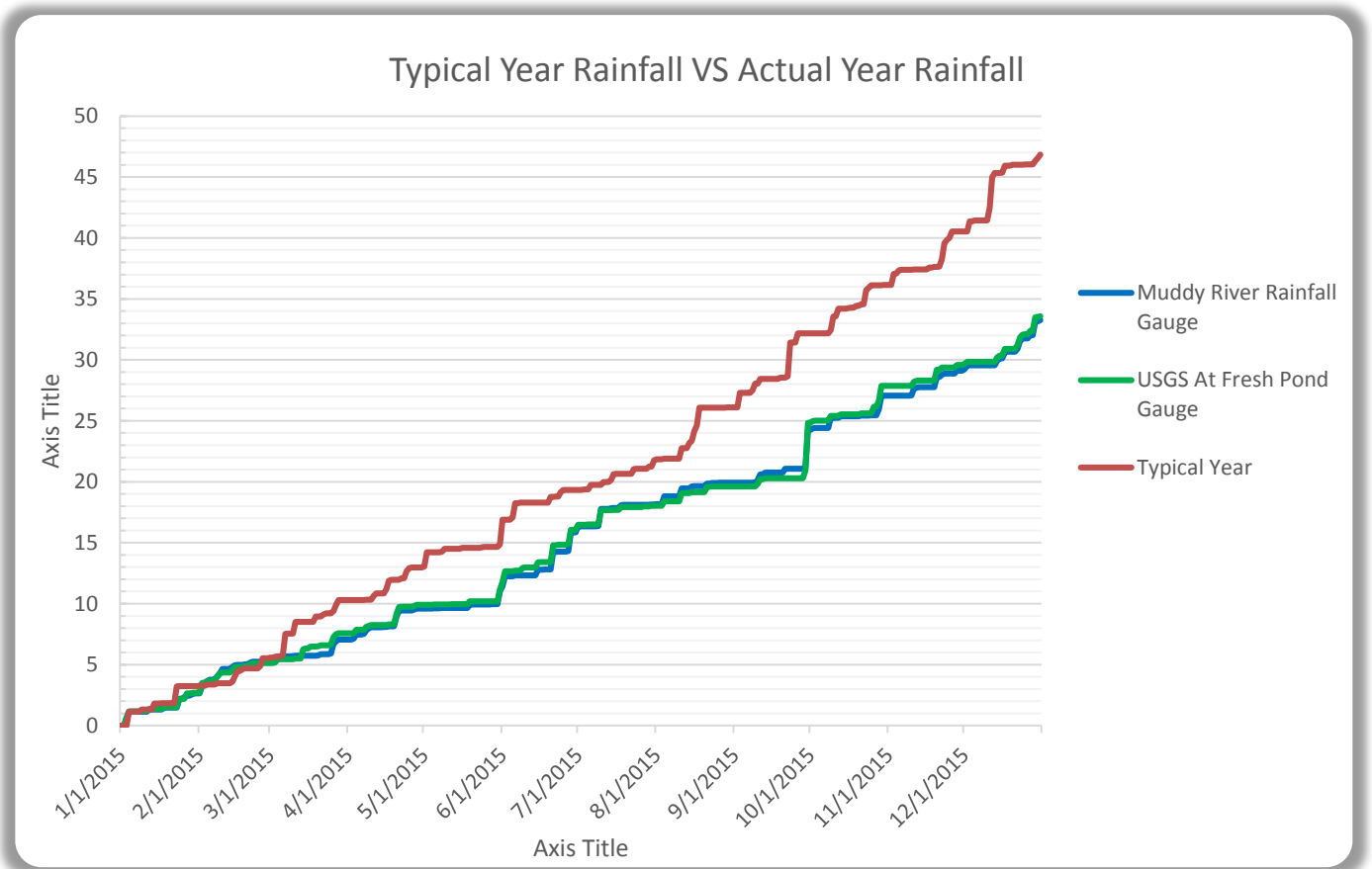
After analyzing the data from the USGS gauge and the Muddy River gauge, the data was reviewed for any inconsistencies. The gauges were compared to the typical year rainfall in order to assess any similarities and differences in the rainfall. Only the USGS meter was imputed into Infoworks to compare the 2015 Combined Sewer System to the Long Term Control Plan issued by the MWRA by using the typical year rainfall data and the 2015 rainfall data.

The results of the rainfall analysis are presented in Appendix I.

Comparison of 2015 Rainfall to Typical Year

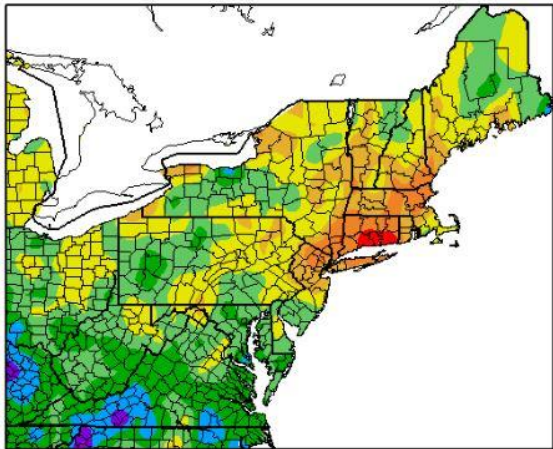
A comparison of the 2015 rainfall at the two (2) locations and the typical year rain gauge is presented through Table 2.4 and Table 2.9. The typical year total rainfall is 46.8 inches spread out through ninety-three (93) storms. The USGS gauge recorded one hundred-five (105) storms that produce 33.58 inches of rain and the Muddy River Gauge recorded ninety-nine (99) storms and 33.26 inches of rain. The USGS and Muddy River rain gauge recorded significantly less rainfall than the typical year though recorded more storms throughout the year.

**Graph 2.1
Typical Year Rainfall versus Actual Year Rainfall**

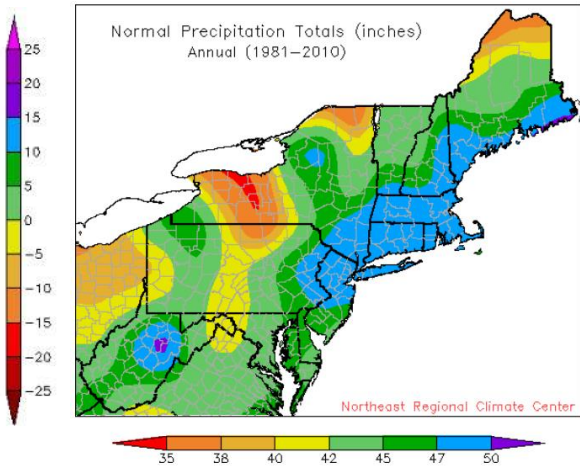


A comparison of rainfall departure from the 20 year average rainfall is shown below. The City of Cambridge was approximately 10-15-inches below normal rainfall for 2015 as shown on map 2.1 when compared to the 20 year rolling average shown on map 2.2.

Map 2.1
2015 Rainfall Departure from Average¹



Map 2.2
Twenty Year Average¹



¹ Maps from Northeast Regional Climate Center

Table 2.4 Comparison of Frequency of Rainfall Events Selected Ranges of Total Rainfall, Typical Year Versus 2015

Table 2.4 Frequency Comparison by Volume

Conditions	Total Rainfall (inches)	Total Number of Storms	Number of Storms by Depth				
			Depth < 0.25 inches	Depth 0.25 to 0.50 inches	Depth 0.5 to 1.0 inches	Depth 1.0 to 2.0 inches	Depth >= 2.0 inches
Typical Year	46.8	93	49	14	16	8	6
Fresh Pond	33.58	105	70	13	13	8	1
Muddy River	33.26	99	64	10	12	12	1

**Graph 2.2
Number of Storms by Depth**

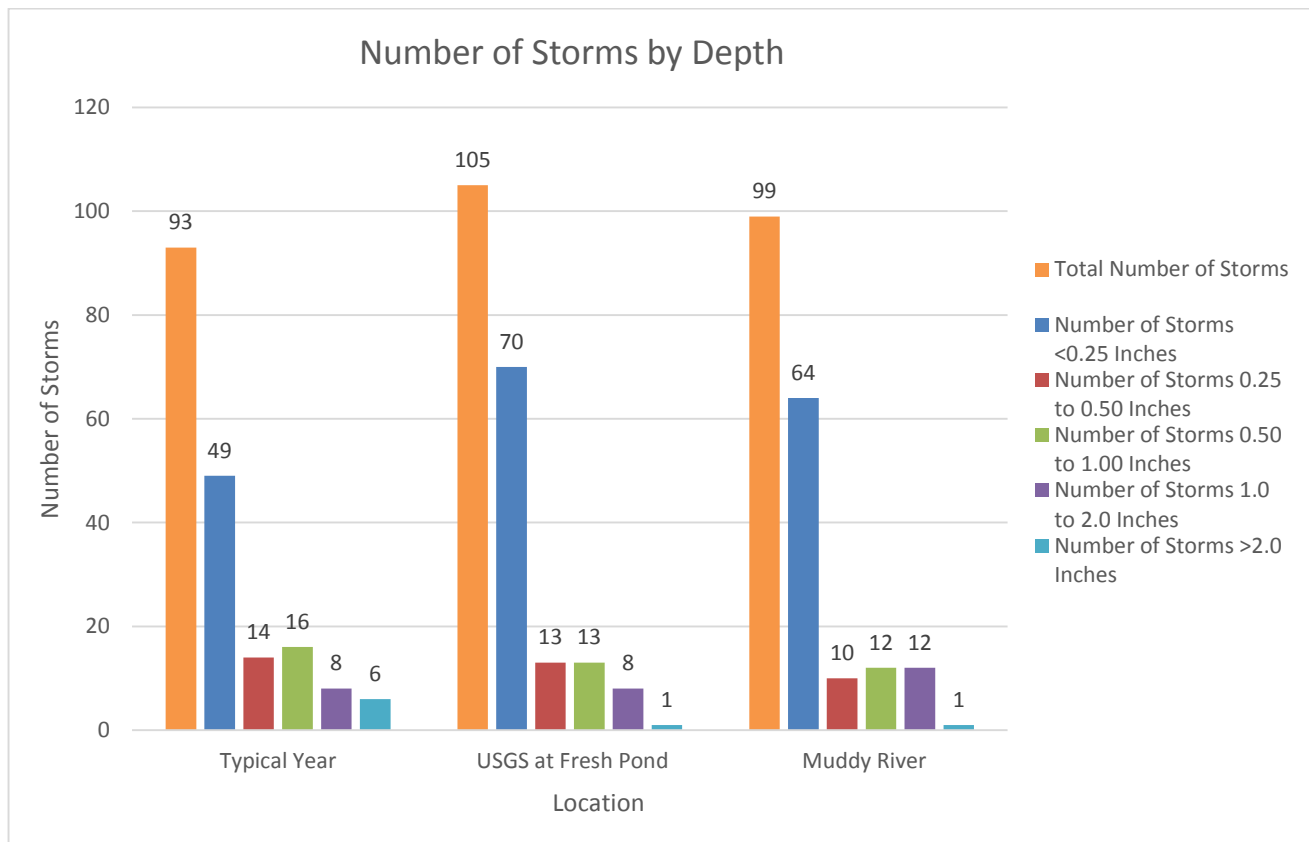


Table 2.5 Frequency Comparison of Total Rainfall Depth Distribution

Conditions	Total Rainfall (inches)	Total Number of Storms	Total Rainfall Total Depth of Storms				
			Depth < 0.25 inches	Depth 0.25 to 0.50 inches	Depth 0.5 to 1.0 inches	Depth 1.0 to 2.0 inches	Depth >= 2.0 inches
Typical Year	46.8	93	3.45	5.4	11.43	10.29	16.21
Fresh Pond	33.58	105	4.37	4.7	9.3	10.66	4.55
Muddy River	33.26	99	3.85	3.25	8.00	14.99	3.17

Graph 2.3 Frequency Comparison of Total Rainfall Depth Distribution

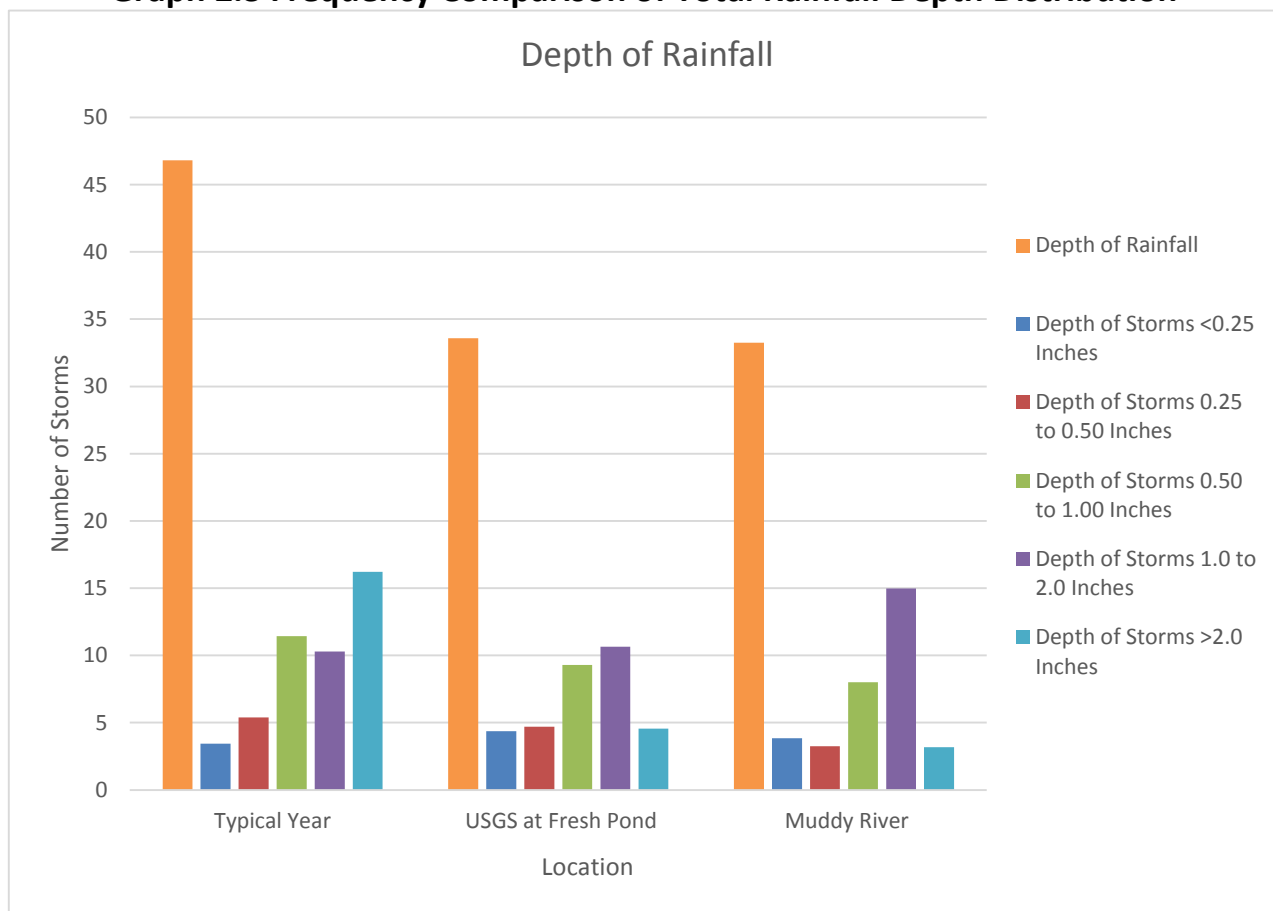


Table 2.4 presents a comparison of storm frequency with a selected range of total precipitation for 2015 and the typical year. The USGS and Muddy River gauge recorded nearly 6-12% more storms when compared to the typical year. For rainfall events less than 0.25 inches both the USGS and Muddy River Gauge were significantly higher than the typical year. When looking at the distribution percentage all three gauges were within 1-inch of each other. For rainfall between 0.25 inches to 0.50 inches the typical year had 14 storms, the USGS Gauge had 13 storms and the Muddy River had 10 storms. This pattern can also be shown in the rainfall Depth with the typical year having 5.4-inches averaging 0.38 inches per storm, the USGS Gauge has a Depth of 4.7 inches with an average of 0.36 inches per storm, and the Muddy River Gauge had a Depth of 3.25 inches with an average of 0.33 inches per storm. The same pattern can be seen in storms with 0.50 to 1.0 inches of rainfall. The typical year had 16 storms with a Depth of 11.43 and an average of 0.71 inches per storm. The USGS Gauge had 13 storms with a Depth of 9.3 inches and an average of 0.71 inches per storm. The Muddy River Gauge had 12 storms with a Depth of 8.0 inches and an average of 0.66 inches per storm. For rainfall between 1.0 to 2.0 inches both the typical year and USGS Gauge recorded 8 storms with a Depth of 10.29 inches and 10.66 inches, respectively. The typical year average was 1.29 inches per storms and the USGS Gauge had an average of 1.33 inches per storms. The Muddy River Gauge recorded 12 storms and 14.99 inches of rain with an average of 1.25 inches per storm. For storms above 2.0 inches the typical year recorded significantly more storms, 6 with a Depth of 16.21 and an average of 2.70 inches per storm. Both the USGS and Muddy River Gauge recorded 1 storms with a total Depth of 4.55 and 3.71.

Graph 2.4 Average Rainfall Per Storm

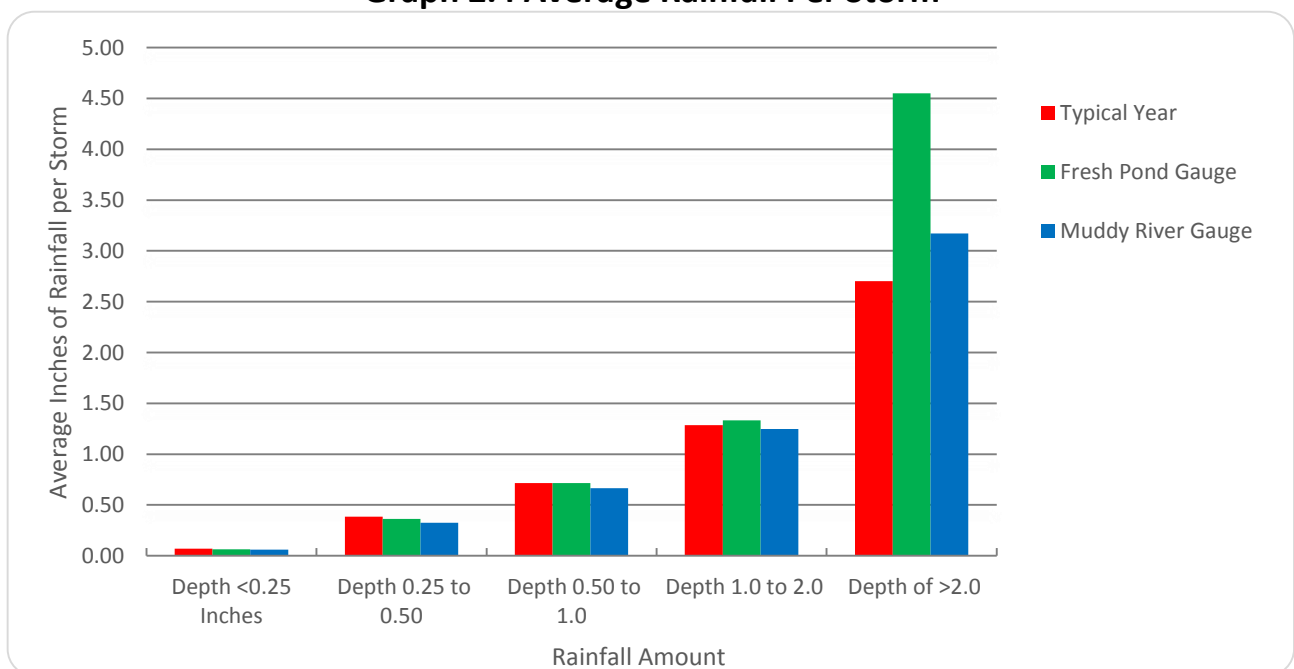


Table 2.6 Frequency Comparison by Percentage of Storms

Conditions	Total Rainfall (inches)	Total Number of Storms	Number of Storms by Percentage				
			Depth < 0.25 inches	Depth 0.25 to 0.50 inches	Depth 0.5 to 1.0 inches	Depth 1.0 to 2.0 inches	Depth >= 2.0 inches
Typical Year	46.8	93	52.69%	15.05%	17.20%	8.60%	6.45%
Fresh Pond	33.58	105	66.67%	12.38%	12.38%	7.62%	0.95%
Muddy River	33.26	99	64.65%	10.10%	12.12%	12.12%	1.01%

Graph 2.5 Frequency Comparison by Percentage of Storms

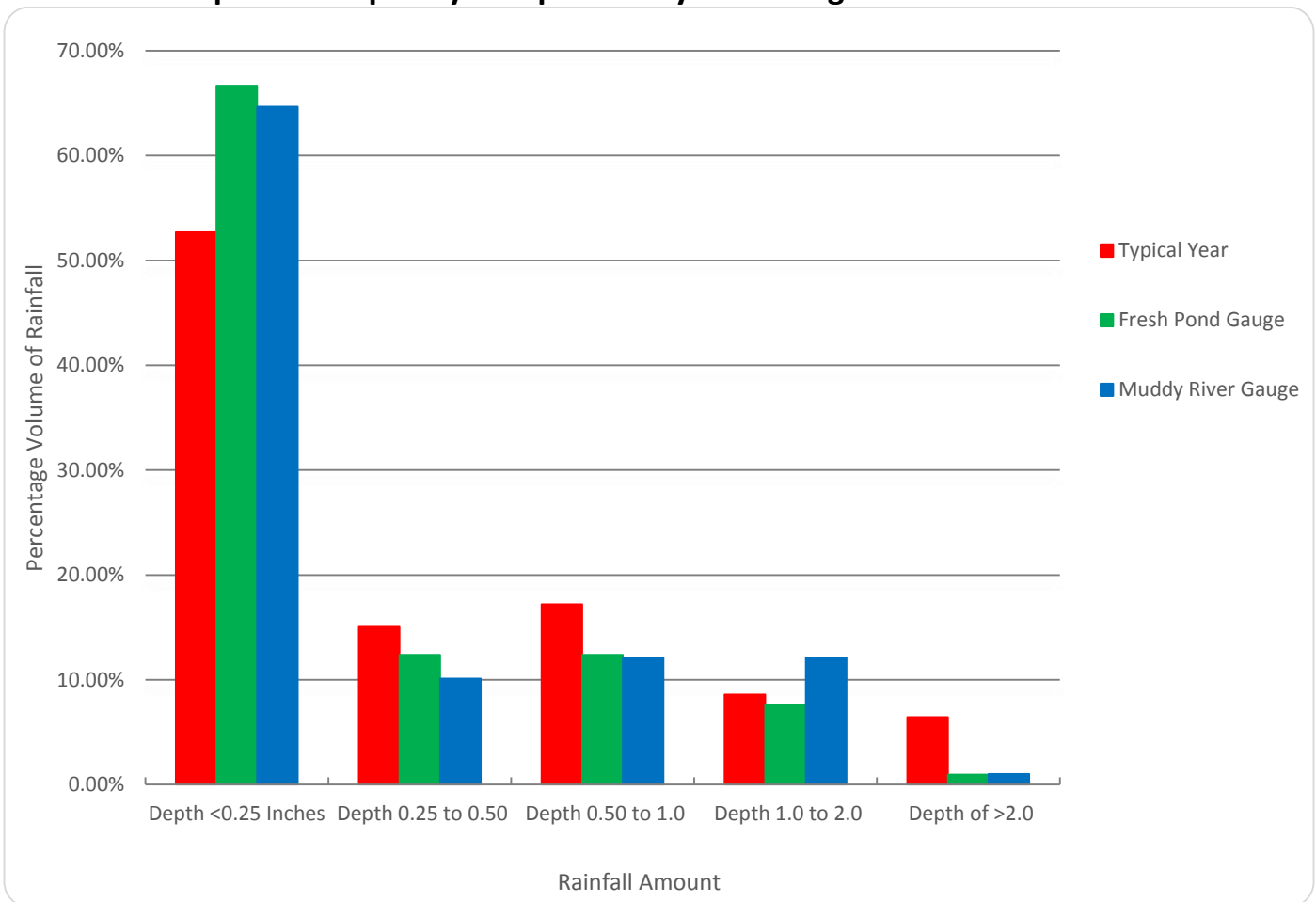
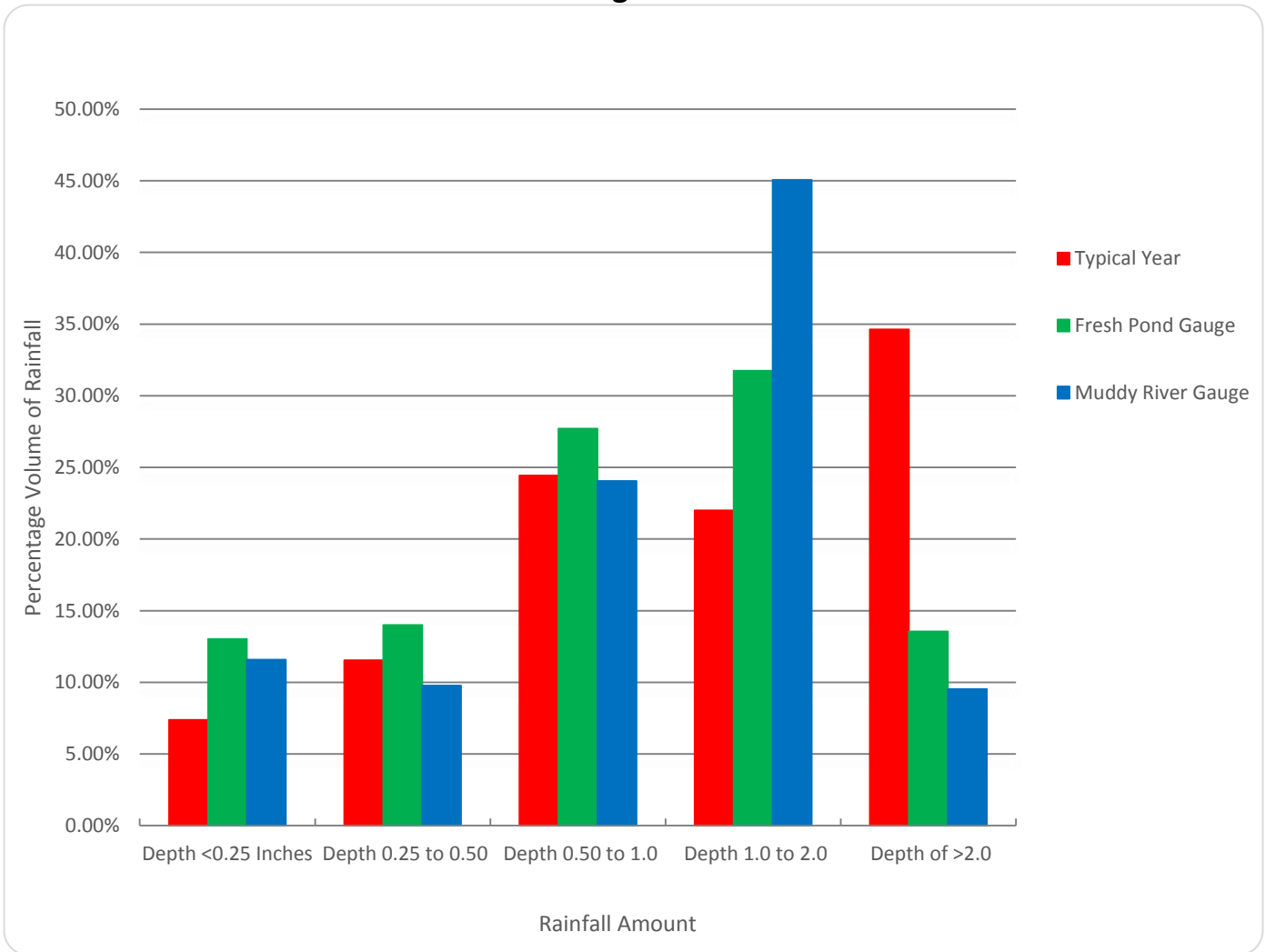


Table 2.7 Frequency Comparison of Total Rainfall Depth Distribution by Percentage

Conditions	Total Rainfall (inches)	Total Number of Storms	Depth of Storms by Percentage				
			Depth < 0.25 inches	Depth 0.25 to 0.50 inches	Depth 0.5 to 1.0 inches	Depth 1.0 to 2.0 inches	Depth >= 2.0 inches
Typical Year	46.8	93	7.37%	11.54%	24.42%	21.99%	34.64%
Fresh Pond	33.58	105	13.01%	14.00%	27.70%	31.75%	13.55%
Muddy River	33.26	99	11.58%	9.77%	24.05%	45.07%	9.53%

Graph 2.6 Frequency Comparison of Total Rainfall Depth Distribution by Percentage



When looking at the rainfall number and depth distribution percentages, as shown on graph 2.5 and graph 2.6, the typical year, USGS Gauge and Muddy River Gauge all have the same general shape and distribution pattern for the number of storms however for depth distribution the amounts deviate at the rainfall from 0.50-inches to 1.0 inches and above. At this point, the Muddy River and USGS gauges continue to increase, the Muddy River much higher than the USGS, while the typical year decreases slightly. The typical year continues an upward trend for the storms above 2.0 inches, while both the USGS and Muddy River gauges decreases significantly.

In conclusion, it is difficult to categorize and compare yearly rainfall due to the variety of storms and atmospheric conditions. The past year the USGS and Muddy River gauge were below average for total rainfall for the year but yet had a larger number of storms when compared to the typical year. When looking at the average rainfall per storm in each of the rainfall categories, all three gauges are very similar and follow a common distribution pattern as shown in graph 2.4.

Table 2.8 presents storms that produce rainfall amounts above 2.0 inches for the USGS and Muddy River gauge as well as the typical year.

TABLE 2.8 COMPARISON OF STORMS GREATER THAN 2 INCHES OF TOTAL RAINFALL, TYPICAL YEAR VERSUS 2015

RAIN GUAGE	STORM NO.	DATE	DURATION	TOTAL RAINFALL	AVERAGE INTENSITY	PEAK INTENSITY	STORM RECURRENCE INTERVAL
			(hours)	(inches)	(in/hr)	(in/hr)	(24-hour)
TYPICAL YEAR	87	12/11/1992	50.00	3.89	0.08	0.2	1Y
	59	8/15/1992	72.00	2.91	0.04	0.66	3M
	67	9/22/1992	23.00	2.76	0.12	0.65	1Y
	83	11/21/1992	84.00	2.39	0.03	0.31	3M
	41	5/31/1992	30.00	2.22	0.07	0.37	3M-6M
	69	10/9/1992	65.00	2.04	0.03	0.42	<3M
USGS GUAGE AT FRESH POND	76	9/29/2015	29.50	4.55	0.45	1.05	10-25YR
MUDDY RIVER	78	9/29/2015	22.25	3.17	0.24	0.86	2-5YR

TABLE 2.9 COMPARISON OF STORMS WITH PEAK INTENSITIES GREATER THAN 0.40 INCHES/HOUR, TYPICAL YEAR VERSUS 2015

RAIN GAUGE	STORM NO.	DATE	DURATION	TOTAL RAINFALL	AVERAGE INTENSITY	PEAK INTENSITY	STORM RECURRENCE INTERVAL
			(hours)	(inches)	(in/hr)	(in/hr)	(24-hour)
TYPICAL YEAR	74	10/23/1992	4	1.18	0.29	1.08	1-2Y
	57	8/11/1992	11	0.87	0.08	0.75	6M-1Y
	59	8/15/1992	72	2.91	0.04	0.66	3M-6M
	67	9/22/1992	23	2.76	0.12	0.65	3M-6M
	35	5/2/1992	7	1.14	0.16	0.63	3M-6M
	63	9/9/1992	1	0.57	0.57	0.57	3M
	61	9/3/1992	13	1.19	0.09	0.51	<3M
	42	6/5/1992	18	1.34	0.07	0.44	<3M
	69	10/9/1992	65	2.04	0.03	0.42	<3M
USGS GAUGE AT FRESH POND	28	3/26/2015	19.50	0.85	0.02	0.56	<3M
	36	4/20/2015	17.00	1.42	0.03	0.53	<3M
	42	5/31/2015	18.00	1.00	0.14	0.41	<3M
	56	7/9/2015	6.75	1.15	0.20	0.54	1-2Y
	76	9/29/2015	29.50	4.55	0.45	1.05	10-25 YR
	86	10/26/2015	0.50	0.51	0.68	0.51	2-5YR
	87	10/28/2015	17.00	0.88	0.03	0.46	3M-6M
MUDDY RIVER GAUGE	54	6/20/2015	16.50	1.43	0.03	0.42	<3M
	59	7/9/2015	5.83	1.41	0.04	0.70	3M-6M
	68	8/4/2015	0.50	0.67	0.17	0.67	2-5Y
	78	9/29/2015	20.68	3.17	0.06	0.86	2-5Y
	85	10/28/2015	24.17	1.59	0.02	0.48	<3M
	98	12/29/2015	18.34	1.10	0.02	0.48	<3M

2.5 Combined Sewer Overflow Comparison

Under the City of Cambridge Combined Sewer Overflow Permit MA0101974, an analysis of the combined sewer overflows for the previous year against the typical year should be performed in the 2015 CSO NPDES Annual Report.

The City of Cambridge has a total of twelve (12) combined sewer overflows located in eleven (11) regulator structures, seven (7) are located on the Alewife Brook and five (5) are located on the Charles River. For the seven (7) overflows that are located on the Alewife Brook, all but one was active for the entire year and one was closed during the year. CAM 400 was permanently closed on March 31, 2011 and CAM 004 was closed on December 27, 2015. Of the five (5) Charles River CSO's, three (3) locations were active year round, while CAM 009 and CAM 011 are temporarily plugged.

A previously calibrated Infoworks model was used to compare all the data. The current 2015 infoworks model was used to calculate the typical rainfall activation volumes for comparison purposes. The activation volumes for the 2015 rainfall were based on actual recordings from the meters placed in the CSO regulatory structures, and in some cases, the Infoworks model was used for activation data.

As discussed under the Rainfall Characteristics, the rainfall that occurred during the 2015 year was less than the typical year. Table 2.10 shows a comparison of 2015 rainfall and the typical year rainfall on the current City of Cambridge combined sewer system and the Long Term Control Plan.

Comparison of 2015 Conditions to Long Term CSO Control Plan

As discussed in the Rainfall Comparison section of this report, the rainfall for 2015 was less than typical year rainfall. The 2015 rainfall had more events, less total rainfall and less intense events than the typical year. The 2015 rainfall also had a larger significant event than any event in the typical year, which produced over 50% of the releases with over 87% of the total volume of the CSO flow (refer to Appendix II). The typical year had multiple events with varying intensity that produced CSO's of varying sizes across the entire system.

When comparing the typical year to the 2015 rainfall, the individual storms' rainfall characteristics, system configuration and performance issues must be considered. Though storms may have the same intensity, the volume and timing needs to be considered as well. The evapo-transpiration index and ground wetness factor also needs to be considered when examining the CSO activations.

Table 2.10 SUMMARY OF 2015 AND TYPICAL YEAR MODEL SIMULATION RESULTS AND COMPARISON TO TYPICAL YEAR LONG TERM CSO CONTROL PLAN

OUTFALL	2015 RAINFALL UNDER 2015 SYSTEM CONDITIONS		TYPICAL-YEAR RAINFALL UNDER 2015 SYSTEM CONDITIONS		2015 RAINFALL W/ LONG TERM CONTROL PLAN		TYPICAL-YEAR RAINFALL W/ LONG TERM CSO CONTROL PLAN	
	ACTIVATION FREQUENCY	VOLUME (MG)	ACTIVATION FREQUENCY	VOLUME (MG)	ACTIVATION FREQUENCY	VOLUME (MG)	ACTIVATION FREQUENCY	VOLUME (MG)
ALEWIFE BROOK								
CAM 001	1	.001	4	0.07	1	0.26	5	0.19
CAM 002	3	2.26	7	1.82	1	0.41	4	0.69
CAM 004	6	14.60	10	16.52	CLOSED	N/A	CLOSED	N/A
CAM 400 ¹	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	N/A	CLOSED	N/A
CAM 401A	1	1.23	9	3.51	5	3.60	5	1.61
CAM 401B	1	0.34	7	1.84	1	3.60	7	2.15
TOTAL	12	18.43	37	23.76	8	7.87	21	4.64³
CHARLES RIVER								
CAM 005	1	0.19	3	0.44	1	1.39	3	0.84
CAM 007	1	0.03	0	0	1	2.97	1	0.03
CAM 009 ²	0	0	0	0	0	0	2	0.01
CAM 011 ²	0	0	0	0	0	0.00	0	0.00
CAM 017	1	1.83	1	0.43	1	1.83	1	0.45
TOTAL	3	2.05	10	0.87	3	6.19	7	1.33

¹CAM 400 CLOSED ON MARCH 31, 2011

²TEMPORARILY PLUGGED

³ THIS TOTAL DOES NOT INCLUDE MWRA 003 AND SOM 001, THE LTCP VOLUME OF CSO IS 7.29 MG PER YEAR

Alewife Brook

The total number of activations for the Alewife Brook was twelve (12) activations with 18.43 million gallons of combined sewer for the 2015 rainfall. Under the typical year rainfall there were thirty-seven (37) activations that produced 23.76 million gallons of combined sewer.

The overall hydraulic conditions for the Alewife Brook catchment area will change over the next several years with the separation of CAM 004 and other upstream and downstream separation, and mitigation efforts by the surrounding towns and the MWRA. The CSO flow into

the MWRA system will be reduced and storm water flow into the Alewife Brook will be cleaner than it is today.

CAM 001

The Long Term Control Plan (LTCP) has CAM 001 producing five (5) activations with an overflow volume of 0.19 MG. The 2015 rainfall produced one total activation with a volume of 1,222 Gallons. According to the Infoworks modeling software, the typical year rainfall on the 2015 system would produce a total of 1 activation that had a volume of 0.26 MG. CAM 001 pattern of activation occurs in conjunction with a high peak intensity driven storms.

CAM 002

The LTCP has CAM 002 producing four (4) activations and an overflow volume of 0.69 MG of combined sewer. The 2015 rainfall produced one (1) overflow that had a total volume of 0.41 MG on the LTCP. The typical year rainfall on the 2015 system produced seven (7) activations that had a total volume of 1.82 MG while the 2015 rainfall produced three (3) activations with a volume of 2.26 MG.

CAM 002 currently has one (1) outfall open. The LTCP has both CAM 002A and CAM 002B overflows open. The LTCP plan also has an overflow to the 60-inch MWRA pipe located in the Alewife Brook Parkway open, which is currently closed. The closure allows for more flow to enter the regulator structure and creates more activations at CAM 002A. The regulating structure has an 18-inch outlet leading the 29"x 33" MWRA relief pipe that conveys the combined sewer flow. Due to this added flow, the total volume entering the structure is greater than the 18-inch outlet can handle during larger rain events and overflows to the Alewife Brook occur. Once the overflow to the Alewife Brook Sewer is open, it will allow for more combined sewer to enter into the MWRA system and reduce overflow activations into the Alewife Brook.

CAM 002 is one of the most active combined sewer overflows in the alewife system. The City of Cambridge bases notifications of a CSO from the SCADA system on CAM 002. In January 2016 it was discovered that the meters in the CAM 002 vault were not working properly and upon further investigation of the system it was discovered that the meters were not calibrated correctly when installed in 2014. The Infoworks model was used in determining CSO overflows for the CAM 002 structure.

CAM 004

The LTCP has CAM 004 closed. The work on the CAM 004 structure was completed on December 27, 2015 and closed on that date.

When reviewing the data for 2015 drainage system, the 2015 rainfall had six (6) activations with 14.60 MG of flow. The typical year on the 2015 system conditions produced ten (10) overflows for a volume of 16.52 MG. The CAM 004 is a complex structure and is usually one of the most active structures, as it proved to be once again in 2015. The upstream and

downstream conditions, the rainfall volume and intensity, and many other factors can lead to activations at this structure.

CAM 401A

The 2015 rainfall produced one (1) activation that had a total release volume of 1.23 MG, and the typical year rainfall on the 2015 system produced nine (9) activations for a total of 3.51 MG. The LTCP has CAM 401A activating five (5) times with total overflow volume of 1.61 MG. The 2015 rainfall on the LTCP produced five (5) activations with a flow of 3.60 MG. CAM 401A is influenced greatly by the peak intensity of a storm. CAM 401A is also influenced by downstream conditions that will be changing once CAM 004 is separated. The hydraulic conditions today do not accurately reflect the LTCP conditions.

CAM 401B

CAM 401B will have seven (7) releases with a total volume of 2.15 MG according to the LTCP. The 2015 rainfall on the LTCP will have 3.60 MG of combined sewer overflow through one (1) activation. The 2015 rainfall produced one (1) activations that had a total volume of 0.34 MG. The typical year rainfall on the 2015 system had a total volume of 1.84 MG through 7 releases. The 10-inch orifice on the relief pipe to the MWRA system for CAM 401B was removed on January 5, 2015. The full 18-inch pipe is now being used as the relief pipe for CAM 401B. The LTCP has this orifice being removed, which will allow more flow into the 18-inch pipe and in turn reduces the amount of CSO activation in the LTCP.

Charles River

For the CSO's that are located on the Charles River the 2015 rainfall produced a total of three (3) releases. All three active CSO's had a release for a total volume of 2.05 MG. The LTCP allows for seven (7) releases with a total volume of 1.33 MG.

CAM 005

The 2015 rainfall produced one (1) activations with a volume of 0.19 MG, while the typical year rainfall produces five (3) activations for a total of 0.44 MG. The LTCP has CAM 005 activating three (3) times with a volume of 0.84 MG.

CAM 007

The Long Term Control Plan has CAM 007 activating once with a CSO release of 0.03 MG. The 2015 rainfall produce one (1) activation for a volume of 0.03 MG, while the typical year rainfall on the 2015 system had no releases. CAM 007, like many of the City's CSO regulating structures, will overflow from a storm with a high hourly peak. The volumes of overflow will also increase when this peak coincides with a storm that has a large volume of rainfall.

CAM 009 and CAM 011

Currently CAM 009 and CAM 011 are temporarily plugged. The LTCP has both of these outfalls open. The City of Cambridge plans to keep these outfalls closed until a more comprehensive study can be completed in this area on the effects of climate change and upstream conditions. This report assumes that these outfalls shall remain closed beyond the LTCP closing date of December 31, 2015.

CAM 017

The LTCP has CAM 017 producing one (1) activation with an overflow of 0.45 MG. The typical year rainfall on the 2015 system produced five (1) activations for a total of 0.43 MG. The 2015 rainfall did produced one (1) activation for the 2015 system for a volume of 1.83 MG. The history of CAM 017 is that the large peak events produce overflows and will remain this way with the bending weir structures.

It is important to note that CAM 017 regulator structure has undergone a major construction project that reconfigured the weir structure. Previously the overflows at CAM 017 were regulated by a 10-ft wide static weir at an elevation of 14.39-ft. There will be three weirs installed in different chambers the two weirs will be set at an elevation of 15.19-ft and will be 7.5-ft wide and the other bending weir will be set at 15.08-ft and will be 9.5-ft wide. The new weirs will have a variable release elevation based on the hydraulic conditions in the system. The implementation of the bending weirs will lower the overall hydraulic grade line and reduce flooding concerns upstream from the bending weirs.

3.0 Status of CSO Abatement Projects`

3.1 Project Updates

The City of Cambridge continues to implement abatement projects in accordance with the Massachusetts Water Resources Authority (MWRA) Final CSO Facilities Plan, the Federal Court Order (US v. MDC., et al., No. 85-0489 (D. Mass)), as amended by the Second Stipulation of the United States and the Massachusetts Water Resources Authority on Responsibility and Legal Liability for Combined Sewer Overflow Control. The information provided in this Annual Report conforms to information and data submitted to the MWRA for inclusion in their court-ordered annual report on CSO abatement project progress.

As described in more detail in the MWRA 2015 CSO Annual Progress Report (available at <http://www.mwra.com/cso/csoannualreports.htm>), the CSO Control Plan for Alewife Brook includes four (4) project components for which the City of Cambridge is responsible, including:

- CAM004 Stormwater Outfall and Wetland Basin (Contract 12)
- CAM004 Sewer Separation (Contracts 8A, 8B, and 9)
- CAM400 Common Manhole Separation (Contract 13)
- Interceptor Connection Relief and Floatables Control (Contract 4)

Contracts 8A, 8B and 9

For a copy of plans visit:

Concord Ave.:

<http://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2013%2falewifese sewerseparationconcordavenueneighborhood>

Huron 8A:

<http://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2010%2falewifese sewerseparationproject>

Huron 8B:

<http://www.cambridgema.gov/theworks/cityprojects/detail.aspx?path=%2fsitecore%2fcontent%2fhome%2ftheworks%2fcityprojects%2f2012%2falewifese sewerseparationprojecthuronb>

3.2 Project Schedule

Design and construction milestones for the Alewife Brook projects were added to Schedule Seven (7) in 2006 when EPA and DEP approved the regional long-term CSO control plan. However, the wetland appeals process continued through 2007 and into 2008. As a result of the delays associated with the wetlands appeals, the City has developed new project schedules and time estimates to complete major design, permitting and construction tasks.

Project	Benefit	Implementation Status	Scheduled Completion
Contract 4: Interceptor Connection Relief and Floatables Control	Upgrades connections between Cambridge and MWRA systems to provide greater capacity; provides floatables control.	Project completed in October 2010.	2010
Contract 13: CAM400 Manhole Separation	Removes stormwater from the sewer system; eliminate CSO at Outfall CAM400.	Project completed in March 2012.	2012
Contract 12: CAM004 Stormwater Outfall and Wetland Basin	Conveys separated stormwater flows to wetland system for treatment and flow attenuation.	Commence construction in Spring 2012.	2014
Contracts 8A, 8B and 9: CAM004 Sewer Separation	Removes stormwater from the sewer system; eliminate CSO at Outfall CAM004.	Early work along Fresh Pond Parkway was completed in 2000-02. Sewer Separation construction has begun in Contract 8A and Contract 8B. Contract 9 is estimated to start in March 2014	2015

Table 3.1 – City of Cambridge CSO Abatement Projects and Status, December 2015

CSO Outfall	Required Project Type Under 2 nd Stipulation	Receiving Water	Contract / Project Name	Completion Date or Proposed Completion Date	Notes
CAM001	Floatables Control	Alewife	Contract 4 - Floatables	October 2010	Baffles installed.
CAM002	Floatables control; interceptor relief	Alewife	Contract 4 - Floatables	October 2010	Baffles installed 2010 and blocked underflow.
CAM004	Sewer Separation	Alewife	2A/2B Fresh Pond Parkway	2001	CSO is now controlled by Drain Vault 5
CAM004	Sewer Separation	Alewife	Contract 8A/8B/9	December 27 th 2015	At completion, CSO at CAM004 will be eliminated; removal of blocked underflow in CAM002 and orifice plate in CAM401B
CAM004	Sewer Separation	Alewife	Contract 12- Stormwater Outfall	April 2013	Stormwater outfall and treatment wetland
CAM400	Sewer Separation / common manholes	Alewife	Contract 13	March 2011	CSO regulator eliminated; convert to stormwater outfall.
CAM401A	Floatables Control	Alewife	Bellis Circle	2005	Installed brush screen
CAM401B	Floatables control; interceptor relief	Alewife	Contract 4- Floatables	October 2010	Baffles installed in 2010 and underflow throttled.
CAM005	Hydraulic Relief	Charles	MWRA CAM005 Hydraulic Relief	2000	For full project description see: http://www.mwra.com/annual/cs_oar/2009/csoar2009.pdf
CAM007	Floatables Control	Charles	Contract 5	2009	Baffle installed
CAM009	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM011	Floatables Control	Charles	Contract 5	2009	Outfall temporarily plugged
CAM017	Floatables Control	Charles	Contract 5	2009	Baffles were installed in 2009.
CAM017	Hydraulic Relief	Charles	CAM 017 Hydraulic Relief	2013	Bending weirs and baffles installed in 2014

4.0 Modifications to Nine Minimum Controls Plan

The Nine Minimum Controls Plan (NMCP) was updated in its entirety and submitted together with the first annual report (April 2009). The plan provides a summary of the evaluations undertaken to address each control measure since the original plan was developed in 1997. Enhancements were made to the NMCP to meet the minimum implementation levels stipulated in the permit.

APPENDIX I

**USGS RAIN GAUGE
AT
FRESH POND**

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
1/1/2015	0.00	0.00	0.00
1/2/2015	0.00	0.00	0.00
1/3/2015	0.64	0.19	0.03
1/4/2015	0.53	0.11	0.02
1/5/2015	0.00	0.00	0.00
1/6/2015	0.00	0.00	0.00
1/7/2015	0.00	0.00	0.00
1/8/2015	0.00	0.00	0.00
1/9/2015	0.04	0.02	0.01
1/10/2015	0.00	0.00	0.00
1/11/2015	0.00	0.00	0.00
1/12/2015	0.15	0.04	0.01
1/13/2015	0.00	0.00	0.00
1/14/2015	0.00	0.00	0.00
1/15/2015	0.01	0.01	0.01
1/16/2015	0.00	0.00	0.00
1/17/2015	0.00	0.00	0.00
1/18/2015	0.16	0.10	0.02
1/19/2015	0.00	0.01	0.00
1/20/2015	0.00	0.00	0.00
1/21/2015	0.00	0.00	0.00
1/22/2015	0.00	0.00	0.00
1/23/2015	0.00	0.00	0.00
1/24/2015	0.64	0.09	0.01
1/25/2015	0.00	0.00	0.00
1/26/2015	0.04	0.01	0.01
1/27/2015	0.43	0.09	0.01
1/28/2015	0.01	0.01	0.01
1/29/2015	0.01	0.01	0.01
1/30/2015	0.03	0.02	0.01
1/31/2015	0.00	0.00	0.00
TOTAL	2.69		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
2/1/2015	0.00	0.00	0.00
2/2/2015	0.82	0.15	0.02
2/3/2015	0.01	0.01	0.01
2/4/2015	0.09	0.09	0.03
2/5/2015	0.08	0.03	0.01
2/6/2015	0.00	0.00	0.00
2/7/2015	0.04	0.03	0.01
2/8/2015	0.28	0.05	0.01
2/9/2015	0.26	0.03	0.01
2/10/2015	0.08	0.03	0.01
2/11/2015	0.00	0.00	0.00
2/12/2015	0.01	0.01	0.01
2/13/2015	0.00	0.00	0.00
2/14/2015	0.24	0.07	0.01
2/15/2015	0.20	0.05	0.01
2/16/2015	0.00	0.00	0.00
2/17/2015	0.00	0.00	0.00
2/18/2015	0.05	0.03	0.01
2/19/2015	0.03	0.03	0.01
2/20/2015	0.00	0.00	0.00
2/21/2015	0.15	0.04	0.01
2/22/2015	0.08	0.06	0.01
2/23/2015	0.00	0.00	0.00
2/24/2015	0.00	0.00	0.00
2/25/2015	0.02	0.01	0.01
2/26/2015	0.00	0.00	0.00
2/27/2015	0.00	0.00	0.00
2/28/2015	0.00	0.00	0.00
TOTAL	2.44		

Notes:

Rainfall was measured in fifteen minute intervals
 Shaded Data denotes CSO discharge.

CSO NPDES Annual Report | 2015

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
3/1/2015	0.00	0.00	0.00
3/2/2015	0.00	0.00	0.00
3/3/2015	0.05	0.04	0.01
3/4/2015	0.26	0.08	0.02
3/5/2015	0.00	0.00	0.00
3/6/2015	0.00	0.00	0.00
3/7/2015	0.00	0.00	0.00
3/8/2015	0.00	0.00	0.00
3/9/2015	0.00	0.00	0.00
3/10/2015	0.00	0.00	0.00
3/11/2015	0.05	0.02	0.01
3/12/2015	0.00	0.00	0.00
3/13/2015	0.00	0.00	0.00
3/14/2015	0.75	0.15	0.02
3/15/2015	0.08	0.04	0.01
3/16/2015	0.00	0.00	0.00
3/17/2015	0.16	0.04	0.01
3/18/2015	0.00	0.00	0.00
3/19/2015	0.00	0.00	0.00
3/20/2015	0.03	0.02	0.01
3/21/2015	0.08	0.03	0.01
3/22/2015	0.00	0.00	0.00
3/23/2015	0.00	0.00	0.00
3/24/2015	0.00	0.00	0.00
3/25/2015	0.04	0.04	0.01
3/26/2015	0.62	0.26	0.03
3/27/2015	0.24	0.07	0.01
3/28/2015	0.08	0.02	0.01
3/29/2015	0.00	0.00	0.00
3/30/2015	0.00	0.00	0.00
3/31/2015	0.00	0.00	0.00
TOTAL	2.44		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

CSO NPDES Annual Report | 2015

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
4/1/2015	0.00	0.00	0.00
4/2/2015	0.00	0.00	0.00
4/3/2015	0.01	0.01	0.01
4/4/2015	0.27	0.21	0.03
4/5/2015	0.00	0.00	0.00
4/6/2015	0.00	0.00	0.00
4/7/2015	0.02	0.02	0.01
4/8/2015	0.21	0.09	0.01
4/9/2015	0.08	0.03	0.01
4/10/2015	0.10	0.05	0.01
4/11/2015	0.00	0.00	0.00
4/12/2015	0.00	0.00	0.00
4/13/2015	0.00	0.00	0.00
4/14/2015	0.00	0.00	0.00
4/15/2015	0.00	0.00	0.00
4/16/2015	0.00	0.00	0.00
4/17/2015	0.05	0.02	0.01
4/18/2015	0.00	0.00	0.00
4/19/2015	0.00	0.00	0.00
4/20/2015	0.81	0.15	0.02
4/21/2015	0.61	0.53	0.06
4/22/2015	0.01	0.01	0.01
4/23/2015	0.01	0.01	0.01
4/24/2015	0.00	0.00	0.00
4/25/2015	0.00	0.00	0.00
4/26/2015	0.00	0.00	0.00
4/27/2015	0.05	0.05	0.02
4/28/2015	0.10	0.07	0.02
4/29/2015	0.00	0.00	0.00
4/30/2015	0.00	0.00	0.00
TOTAL	2.33		

Rainfall was measured in fifteen minute intervals
 Shaded Data denotes CSO discharge.

CSO NPDES Annual Report | 2015

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
5/1/2015	0.00	0.00	0.00
5/2/2015	0.00	0.00	0.00
5/3/2015	0.00	0.00	0.00
5/4/2015	0.00	0.00	0.00
5/5/2015	0.04	0.04	0.01
5/6/2015	0.00	0.00	0.00
5/7/2015	0.00	0.00	0.00
5/8/2015	0.00	0.00	0.00
5/9/2015	0.00	0.00	0.00
5/10/2015	0.00	0.00	0.00
5/11/2015	0.00	0.00	0.00
5/12/2015	0.02	0.01	0.01
5/13/2015	0.00	0.00	0.00
5/14/2015	0.00	0.00	0.00
5/15/2015	0.00	0.00	0.00
5/16/2015	0.00	0.00	0.00
5/17/2015	0.00	0.00	0.00
5/18/2015	0.00	0.00	0.00
5/19/2015	0.23	0.11	0.02
5/20/2015	0.00	0.01	0.00
5/21/2015	0.00	0.00	0.00
5/22/2015	0.00	0.00	0.00
5/23/2015	0.00	0.00	0.00
5/24/2015	0.00	0.00	0.00
5/25/2015	0.00	0.00	0.00
5/26/2015	0.00	0.00	0.00
5/27/2015	0.00	0.00	0.00
5/28/2015	0.00	0.00	0.00
5/29/2015	0.00	0.00	0.00
5/30/2015	0.00	0.00	0.00
5/31/2015	1.00	0.41	0.04
TOTAL	1.29		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

CSO NPDES Annual Report | 2015

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
6/1/2015	0.59	0.18	0.02
6/2/2015	0.88	0.24	0.03
6/3/2015	0.00	0.00	0.00
6/4/2015	0.00	0.00	0.00
6/5/2015	0.00	0.00	0.00
6/6/2015	0.06	0.06	0.06
6/7/2015	0.00	0.00	0.00
6/8/2015	0.00	0.00	0.00
6/9/2015	0.23	0.21	0.08
6/10/2015	0.01	0.01	0.01
6/11/2015	0.00	0.00	0.00
6/12/2015	0.00	0.00	0.00
6/13/2015	0.00	0.00	0.00
6/14/2015	0.00	0.00	0.00
6/15/2015	0.43	0.09	0.01
6/16/2015	0.01	0.01	0.01
6/17/2015	0.00	0.00	0.00
6/18/2015	0.00	0.00	0.00
6/19/2015	0.00	0.00	0.00
6/20/2015	0.00	0.00	0.00
6/21/2015	1.38	0.26	0.04
6/22/2015	0.00	0.00	0.00
6/23/2015	0.05	0.02	0.01
6/24/2015	0.00	0.01	0.00
6/25/2015	0.00	0.00	0.00
6/26/2015	0.00	0.00	0.00
6/27/2015	0.06	0.03	0.02
6/28/2015	1.17	0.26	0.03
6/29/2015	0.00	0.00	0.00
6/30/2015	0.00	0.00	0.00
TOTAL	4.87		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
7/1/2015	0.41	0.27	0.05
7/2/2015	0.00	0.00	0.00
7/3/2015	0.00	0.00	0.00
7/4/2015	0.01	0.01	0.01
7/5/2015	0.01	0.01	0.01
7/6/2015	0.01	0.01	0.01
7/7/2015	0.00	0.00	0.00
7/8/2015	0.01	0.01	0.01
7/9/2015	0.04	0.03	0.01
7/10/2015	1.11	0.54	0.06
7/11/2015	0.00	0.00	0.00
7/12/2015	0.00	0.00	0.00
7/13/2015	0.00	0.00	0.00
7/14/2015	0.00	0.00	0.00
7/15/2015	0.03	0.02	0.01
7/16/2015	0.00	0.00	0.00
7/17/2015	0.00	0.00	0.00
7/18/2015	0.24	0.18	0.03
7/19/2015	0.01	0.01	0.01
7/20/2015	0.00	0.00	0.00
7/21/2015	0.00	0.00	0.00
7/22/2015	0.00	0.00	0.00
7/23/2015	0.00	0.00	0.00
7/24/2015	0.00	0.00	0.00
7/25/2015	0.00	0.00	0.00
7/26/2015	0.00	0.00	0.00
7/27/2015	0.05	0.03	0.01
7/28/2015	0.00	0.00	0.00
7/29/2015	0.00	0.00	0.00
7/30/2015	0.03	0.02	0.01
7/31/2015	0.01	0.01	0.01
TOTAL	1.97		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
8/1/2015	0.01	0.01	0.01
8/2/2015	0.00	0.00	0.00
8/3/2015	0.00	0.00	0.00
8/4/2015	0.36	0.36	0.18
8/5/2015	0.00	0.00	0.00
8/6/2015	0.00	0.00	0.00
8/7/2015	0.00	0.00	0.00
8/8/2015	0.00	0.00	0.00
8/9/2015	0.00	0.00	0.00
8/10/2015	0.00	0.00	0.00
8/11/2015	0.66	0.31	0.03
8/12/2015	0.00	0.00	0.00
8/13/2015	0.00	0.00	0.00
8/14/2015	0.00	0.00	0.00
8/15/2015	0.08	0.08	0.02
8/16/2015	0.01	0.06	0.01
8/17/2015	0.00	0.00	0.00
8/18/2015	0.00	0.00	0.00
8/19/2015	0.00	0.00	0.00
8/20/2015	0.00	0.00	0.00
8/21/2015	0.44	0.21	0.05
8/22/2015	0.00	0.00	0.00
8/23/2015	0.02	0.01	0.01
8/24/2015	0.00	0.00	0.00
8/25/2015	0.00	0.00	0.00
8/26/2015	0.00	0.00	0.00
8/27/2015	0.00	0.00	0.00
8/28/2015	0.00	0.00	0.00
8/29/2015	0.00	0.00	0.00
8/30/2015	0.00	0.00	0.00
8/31/2015	0.00	0.00	0.00
TOTAL	1.58		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
9/1/2015	0.00	0.00	0.00
9/2/2015	0.00	0.00	0.00
9/3/2015	0.00	0.00	0.00
9/4/2015	0.01	0.01	0.01
9/5/2015	0.00	0.00	0.00
9/6/2015	0.00	0.00	0.00
9/7/2015	0.00	0.00	0.00
9/8/2015	0.00	0.00	0.00
9/9/2015	0.00	0.00	0.00
9/10/2015	0.20	0.11	0.02
9/11/2015	0.40	0.18	0.03
9/12/2015	0.00	0.00	0.00
9/13/2015	0.06	0.02	0.01
9/14/2015	0.00	0.00	0.00
9/15/2015	0.00	0.00	0.00
9/16/2015	0.00	0.00	0.00
9/17/2015	0.00	0.00	0.00
9/18/2015	0.00	0.00	0.00
9/19/2015	0.00	0.00	0.00
9/20/2015	0.00	0.00	0.00
9/21/2015	0.00	0.00	0.00
9/22/2015	0.00	0.00	0.00
9/23/2015	0.00	0.00	0.00
9/24/2015	0.00	0.00	0.00
9/25/2015	0.00	0.00	0.00
9/26/2015	0.00	0.00	0.00
9/27/2015	0.00	0.00	0.00
9/28/2015	0.00	0.00	0.00
9/29/2015	0.66	0.37	0.08
9/30/2015	3.89	1.05	0.12
TOTAL	5.22		

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
10/1/2015	0.03	0.02	0.01
10/2/2015	0.12	0.04	0.01
10/3/2015	0.02	0.01	0.01
10/4/2015	0.00	0.00	0.00
10/5/2015	0.00	0.00	0.00
10/6/2015	0.00	0.00	0.00
10/7/2015	0.00	0.00	0.00
10/8/2015	0.04	0.04	0.04
10/9/2015	0.36	0.15	0.02
10/10/2015	0.00	0.00	0.00
10/11/2015	0.00	0.00	0.00
10/12/2015	0.00	0.00	0.00
10/13/2015	0.13	0.07	0.02
10/14/2015	0.00	0.00	0.00
10/15/2015	0.00	0.00	0.00
10/16/2015	0.00	0.00	0.00
10/17/2015	0.00	0.00	0.00
10/18/2015	0.00	0.00	0.00
10/19/2015	0.00	0.00	0.00
10/20/2015	0.01	0.01	0.01
10/21/2015	0.07	0.06	0.01
10/22/2015	0.00	0.00	0.00
10/23/2015	0.00	0.00	0.00
10/24/2015	0.00	0.00	0.00
10/25/2015	0.03	0.02	0.01
10/26/2015	0.51	0.51	0.17
10/27/2015	0.00	0.00	0.00
10/28/2015	0.49	0.14	0.02
10/29/2015	1.22	0.46	0.06
10/30/2015	0.00	0.00	0.00
10/31/2015	0.00	0.00	0.00
TOTAL	3.03		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
11/1/2015	0.00	0.00	0.00
11/2/2015	0.00	0.00	0.00
11/3/2015	0.00	0.00	0.00
11/4/2015	0.00	0.00	0.00
11/5/2015	0.00	0.00	0.00
11/6/2015	0.00	0.00	0.00
11/7/2015	0.00	0.00	0.00
11/8/2015	0.00	0.00	0.00
11/9/2015	0.00	0.00	0.00
11/10/2015	0.01	0.01	0.01
11/11/2015	0.34	0.06	0.01
11/12/2015	0.08	0.03	0.01
11/13/2015	0.02	0.01	0.01
11/14/2015	0.00	0.00	0.00
11/15/2015	0.00	0.00	0.00
11/16/2015	0.00	0.00	0.00
11/17/2015	0.00	0.00	0.00
11/18/2015	0.00	0.00	0.00
11/19/2015	0.00	0.00	0.00
11/20/2015	0.88	0.36	0.03
11/21/2015	0.00	0.00	0.00
11/22/2015	0.18	0.05	0.01
11/23/2015	0.00	0.04	0.00
11/24/2015	0.00	0.00	0.00
11/25/2015	0.00	0.00	0.00
11/26/2015	0.00	0.00	0.00
11/27/2015	0.00	0.00	0.00
11/28/2015	0.22	0.06	0.01
11/29/2015	0.00	0.00	0.00
11/30/2015	0.00	0.00	0.00
TOTAL	1.73		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT FRESH POND, CAMBRIDGE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
12/1/2015	0.09	0.05	0.01
12/2/2015	0.16	0.05	0.01
12/3/2015	0.00	0.00	0.00
12/4/2015	0.00	0.00	0.00
12/5/2015	0.00	0.00	0.00
12/6/2015	0.00	0.00	0.00
12/7/2015	0.00	0.00	0.00
12/8/2015	0.00	0.00	0.00
12/9/2015	0.00	0.00	0.00
12/10/2015	0.00	0.00	0.00
12/11/2015	0.00	0.00	0.00
12/12/2015	0.00	0.00	0.00
12/13/2015	0.00	0.00	0.00
12/14/2015	0.36	0.17	0.04
12/15/2015	0.15	0.10	0.02
12/16/2015	0.00	0.00	0.00
12/17/2015	0.55	0.13	0.02
12/18/2015	0.01	0.02	0.01
12/19/2015	0.00	0.00	0.00
12/20/2015	0.00	0.00	0.00
12/21/2015	0.00	0.00	0.00
12/22/2015	0.30	0.10	0.02
12/23/2015	0.62	0.21	0.03
12/24/2015	0.25	0.19	0.03
12/25/2015	0.01	0.01	0.01
12/26/2015	0.00	0.00	0.00
12/27/2015	0.28	0.07	0.01
12/28/2015	0.00	0.00	0.00
12/29/2015	1.13	0.16	0.02
12/30/2015	0.02	0.02	0.01
12/31/2015	0.06	0.03	0.01
TOTAL	3.99		

Notes:

Rainfall was measured in fifteen minute intervals

Shaded Data denotes CSO discharge.

**USGS RAIN GAUGE
AT
MUDDY RIVER**

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
1/1/2015	0.00	0.00	0.00
1/2/2015	0.00	0.00	0.00
1/3/2015	0.56	0.21	0.03
1/4/2015	0.57	0.14	0.02
1/5/2015	0.00	0.01	0.00
1/6/2015	0.00	0.00	0.00
1/7/2015	0.00	0.00	0.00
1/8/2015	0.00	0.00	0.00
1/9/2015	0.02	0.01	0.01
1/10/2015	0.00	0.00	0.00
1/11/2015	0.00	0.00	0.00
1/12/2015	0.16	0.05	0.01
1/13/2015	0.00	0.00	0.00
1/14/2015	0.00	0.00	0.00
1/15/2015	0.02	0.01	0.01
1/16/2015	0.00	0.00	0.00
1/17/2015	0.00	0.00	0.00
1/18/2015	0.15	0.11	0.02
1/19/2015	0.00	0.00	0.00
1/20/2015	0.00	0.00	0.00
1/21/2015	0.00	0.00	0.00
1/22/2015	0.00	0.00	0.00
1/23/2015	0.00	0.00	0.00
1/24/2015	0.71	0.11	0.01
1/25/2015	0.01	0.01	0.01
1/26/2015	0.12	0.03	0.01
1/27/2015	0.15	0.03	0.01
1/28/2015	0.00	0.00	0.00
1/29/2015	0.09	0.06	0.01
1/30/2015	0.09	0.02	0.01
1/31/2015	0.00	0.00	0.00
TOTAL	2.65		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
2/1/2015	0.00	0.00	0.00
2/2/2015	0.58	0.09	0.01
2/3/2015	0.27	0.04	0.01
2/4/2015	0.15	0.05	0.01
2/5/2015	0.10	0.04	0.01
2/6/2015	0.00	0.00	0.00
2/7/2015	0.04	0.03	0.01
2/8/2015	0.26	0.03	0.01
2/9/2015	0.22	0.02	0.01
2/10/2015	0.36	0.13	0.01
2/11/2015	0.00	0.00	0.00
2/12/2015	0.00	0.00	0.00
2/13/2015	0.00	0.00	0.00
2/14/2015	0.19	0.04	0.01
2/15/2015	0.13	0.03	0.01
2/16/2015	0.02	0.01	0.01
2/17/2015	0.01	0.01	0.01
2/18/2015	0.01	0.01	0.01
2/19/2015	0.03	0.02	0.01
2/20/2015	0.00	0.00	0.00
2/21/2015	0.13	0.04	0.01
2/22/2015	0.08	0.05	0.01
2/23/2015	0.00	0.00	0.00
2/24/2015	0.00	0.00	0.00
2/25/2015	0.02	0.01	0.01
2/26/2015	0.00	0.00	0.00
2/27/2015	0.00	0.00	0.00
2/28/2015	0.00	0.00	0.00
TOTAL	2.60		

Notes:

Rainfall was measured in ten minute intervals
 Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
3/1/2015	0.12	0.03	0.01
3/2/2015	0.03	0.02	0.01
3/3/2015	0.16	0.06	0.01
3/4/2015	0.11	0.06	0.01
3/5/2015	0.00	0.00	0.00
3/6/2015	0.00	0.00	0.00
3/7/2015	0.00	0.00	0.00
3/8/2015	0.00	0.00	0.00
3/9/2015	0.00	0.00	0.00
3/10/2015	0.04	0.02	0.01
3/11/2015	0.02	0.02	0.01
3/12/2015	0.00	0.00	0.00
3/13/2015	0.00	0.00	0.00
3/14/2015	0.00	0.00	0.00
3/15/2015	0.00	0.00	0.00
3/16/2015	0.00	0.00	0.00
3/17/2015	0.00	0.00	0.00
3/18/2015	0.01	0.01	0.01
3/19/2015	0.00	0.00	0.00
3/20/2015	0.02	0.02	0.01
3/21/2015	0.09	0.04	0.01
3/22/2015	0.00	0.00	0.00
3/23/2015	0.00	0.00	0.00
3/24/2015	0.00	0.00	0.00
3/25/2015	0.05	0.05	0.01
3/26/2015	0.79	0.36	0.02
3/27/2015	0.22	0.06	0.01
3/28/2015	0.14	0.04	0.01
3/29/2015	0.00	0.00	0.00
3/30/2015	0.01	0.01	0.01
3/31/2015	0.00	0.00	0.00
TOTAL	1.81		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2015 DAILY RAINFALL DATA
USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
4/1/2015	0.00	0.00	0.00
4/2/2015	0.00	0.00	0.00
4/3/2015	0.06	0.05	0.02
4/4/2015	0.34	0.28	0.03
4/5/2015	0.01	0.01	0.01
4/6/2015	0.00	0.00	0.00
4/7/2015	0.05	0.02	0.01
4/8/2015	0.27	0.09	0.01
4/9/2015	0.19	0.08	0.01
4/10/2015	0.08	0.05	0.01
4/11/2015	0.00	0.00	0.00
4/12/2015	0.00	0.00	0.00
4/13/2015	0.00	0.00	0.00
4/14/2015	0.01	0.01	0.01
4/15/2015	0.01	0.01	0.01
4/16/2015	0.00	0.00	0.00
4/17/2015	0.06	0.03	0.01
4/18/2015	0.01	0.01	0.01
4/19/2015	0.00	0.00	0.00
4/20/2015	0.77	0.16	0.02
4/21/2015	0.51	0.45	0.05
4/22/2015	0.01	0.01	0.01
4/23/2015	0.01	0.01	0.01
4/24/2015	0.00	0.00	0.00
4/25/2015	0.00	0.00	0.00
4/26/2015	0.00	0.00	0.00
4/27/2015	0.06	0.05	0.02
4/28/2015	0.08	0.06	0.01
4/29/2015	0.01	0.01	0.01
4/30/2015	0.00	0.00	0.00
TOTAL	2.54		

Notes:

Rainfall was measured in ten minute intervals
Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
5/1/2015	0.00	0.00	0.00
5/2/2015	0.00	0.00	0.00
5/3/2015	0.00	0.00	0.00
5/4/2015	0.00	0.00	0.00
5/5/2015	0.02	0.02	0.01
5/6/2015	0.00	0.00	0.00
5/7/2015	0.01	0.01	0.01
5/8/2015	0.01	0.01	0.01
5/9/2015	0.00	0.00	0.00
5/10/2015	0.00	0.00	0.00
5/11/2015	0.00	0.00	0.00
5/12/2015	0.02	0.01	0.01
5/13/2015	0.00	0.00	0.00
5/14/2015	0.00	0.00	0.00
5/15/2015	0.00	0.00	0.00
5/16/2015	0.00	0.00	0.00
5/17/2015	0.00	0.00	0.00
5/18/2015	0.00	0.00	0.00
5/19/2015	0.26	0.14	0.01
5/20/2015	0.01	0.01	0.01
5/21/2015	0.00	0.00	0.00
5/22/2015	0.00	0.00	0.00
5/23/2015	0.00	0.00	0.00
5/24/2015	0.00	0.00	0.00
5/25/2015	0.00	0.00	0.00
5/26/2015	0.00	0.00	0.00
5/27/2015	0.00	0.00	0.00
5/28/2015	0.04	0.04	0.02
5/29/2015	0.00	0.00	0.00
5/30/2015	0.00	0.00	0.00
5/31/2015	1.05	0.32	0.02
TOTAL	1.42		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
6/1/2015	0.42	0.07	0.01
6/2/2015	0.81	0.23	0.02
6/3/2015	0.00	0.00	0.00
6/4/2015	0.00	0.00	0.00
6/5/2015	0.00	0.00	0.00
6/6/2015	0.06	0.06	0.02
6/7/2015	0.00	0.00	0.00
6/8/2015	0.00	0.00	0.00
6/9/2015	0.01	0.01	0.01
6/10/2015	0.00	0.00	0.00
6/11/2015	0.00	0.00	0.00
6/12/2015	0.00	0.00	0.00
6/13/2015	0.00	0.00	0.00
6/14/2015	0.00	0.00	0.00
6/15/2015	0.48	0.12	0.01
6/16/2015	0.00	0.00	0.00
6/17/2015	0.00	0.00	0.00
6/18/2015	0.01	0.01	0.01
6/19/2015	0.00	0.00	0.00
6/20/2015	0.01	0.01	0.01
6/21/2015	1.42	0.42	0.03
6/22/2015	0.00	0.00	0.00
6/23/2015	0.02	0.01	0.01
6/24/2015	0.00	0.00	0.00
6/25/2015	0.00	0.00	0.00
6/26/2015	0.01	0.01	0.01
6/27/2015	0.06	0.04	0.01
6/28/2015	1.51	0.39	0.02
6/29/2015	0.00	0.00	0.00
6/30/2015	0.00	0.00	0.00
TOTAL	4.82		

Notes:

Rainfall was measured in ten minute intervals
 Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
7/1/2015	0.51	0.29	0.03
7/2/2015	0.00	0.00	0.00
7/3/2015	0.00	0.00	0.00
7/4/2015	0.00	0.00	0.00
7/5/2015	0.00	0.00	0.00
7/6/2015	0.00	0.00	0.00
7/7/2015	0.00	0.00	0.00
7/8/2015	0.00	0.00	0.00
7/9/2015	0.03	0.02	0.01
7/10/2015	1.38	0.70	0.05
7/11/2015	0.00	0.00	0.00
7/12/2015	0.00	0.00	0.00
7/13/2015	0.01	0.01	0.01
7/14/2015	0.06	0.06	0.06
7/15/2015	0.02	0.02	0.01
7/16/2015	0.00	0.00	0.00
7/17/2015	0.00	0.00	0.00
7/18/2015	0.24	0.22	0.03
7/19/2015	0.01	0.01	0.01
7/20/2015	0.00	0.00	0.00
7/21/2015	0.00	0.00	0.00
7/22/2015	0.00	0.00	0.00
7/23/2015	0.00	0.00	0.00
7/24/2015	0.00	0.00	0.00
7/25/2015	0.00	0.00	0.00
7/26/2015	0.00	0.00	0.00
7/27/2015	0.01	0.01	0.01
7/28/2015	0.00	0.00	0.00
7/29/2015	0.00	0.00	0.00
7/30/2015	0.03	0.02	0.01
7/31/2015	0.00	0.00	0.00
TOTAL	2.30		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
8/1/2015	0.01	0.01	0.01
8/2/2015	0.00	0.00	0.00
8/3/2015	0.00	0.00	0.00
8/4/2015	0.67	0.67	0.17
8/5/2015	0.00	0.00	0.00
8/6/2015	0.00	0.00	0.00
8/7/2015	0.00	0.00	0.00
8/8/2015	0.00	0.00	0.00
8/9/2015	0.00	0.00	0.00
8/10/2015	0.00	0.00	0.00
8/11/2015	0.64	0.22	0.02
8/12/2015	0.00	0.00	0.00
8/13/2015	0.00	0.00	0.00
8/14/2015	0.00	0.00	0.00
8/15/2015	0.15	0.07	0.02
8/16/2015	0.02	0.07	0.01
8/17/2015	0.00	0.00	0.00
8/18/2015	0.02	0.02	0.01
8/19/2015	0.00	0.00	0.00
8/20/2015	0.00	0.00	0.00
8/21/2015	0.19	0.11	0.02
8/22/2015	0.00	0.00	0.00
8/23/2015	0.07	0.03	0.01
8/24/2015	0.00	0.00	0.00
8/25/2015	0.00	0.00	0.00
8/26/2015	0.01	0.01	0.01
8/27/2015	0.00	0.00	0.00
8/28/2015	0.00	0.00	0.00
8/29/2015	0.00	0.00	0.00
8/30/2015	0.00	0.00	0.00
8/31/2015	0.00	0.00	0.00
TOTAL	1.78		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
2015 DAILY RAINFALL DATA
USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
9/1/2015	0.00	0.00	0.00
9/2/2015	0.00	0.00	0.00
9/3/2015	0.00	0.00	0.00
9/4/2015	0.00	0.00	0.00
9/5/2015	0.00	0.00	0.00
9/6/2015	0.00	0.00	0.00
9/7/2015	0.00	0.00	0.00
9/8/2015	0.00	0.00	0.00
9/9/2015	0.00	0.00	0.00
9/10/2015	0.20	0.12	0.02
9/11/2015	0.48	0.16	0.02
9/12/2015	0.00	0.00	0.00
9/13/2015	0.15	0.07	0.01
9/14/2015	0.00	0.00	0.00
9/15/2015	0.00	0.00	0.00
9/16/2015	0.00	0.00	0.00
9/17/2015	0.00	0.00	0.00
9/18/2015	0.00	0.00	0.00
9/19/2015	0.00	0.00	0.00
9/20/2015	0.00	0.00	0.00
9/21/2015	0.32	0.32	0.32
9/22/2015	0.00	0.00	0.00
9/23/2015	0.00	0.00	0.00
9/24/2015	0.00	0.00	0.00
9/25/2015	0.00	0.00	0.00
9/26/2015	0.00	0.00	0.00
9/27/2015	0.00	0.00	0.00
9/28/2015	0.00	0.00	0.00
9/29/2015	0.11	0.10	0.02
9/30/2015	3.06	0.86	0.07
TOTAL	4.32		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
10/1/2015	0.02	0.01	0.01
10/2/2015	0.14	0.05	0.01
10/3/2015	0.02	0.01	0.01
10/4/2015	0.00	0.00	0.00
10/5/2015	0.00	0.00	0.00
10/6/2015	0.00	0.00	0.00
10/7/2015	0.00	0.00	0.00
10/8/2015	0.00	0.00	0.00
10/9/2015	0.82	0.48	0.04
10/10/2015	0.00	0.00	0.00
10/11/2015	0.00	0.00	0.00
10/12/2015	0.00	0.00	0.00
10/13/2015	0.13	0.06	0.02
10/14/2015	0.00	0.00	0.00
10/15/2015	0.00	0.00	0.00
10/16/2015	0.00	0.00	0.00
10/17/2015	0.00	0.00	0.00
10/18/2015	0.00	0.00	0.00
10/19/2015	0.00	0.00	0.00
10/20/2015	0.00	0.00	0.00
10/21/2015	0.05	0.05	0.01
10/22/2015	0.00	0.00	0.00
10/23/2015	0.00	0.00	0.00
10/24/2015	0.00	0.00	0.00
10/25/2015	0.04	0.03	0.01
10/26/2015	0.00	0.00	0.00
10/27/2015	0.00	0.00	0.00
10/28/2015	0.49	0.12	0.02
10/29/2015	1.10	0.48	0.04
10/30/2015	0.00	0.00	0.00
10/31/2015	0.00	0.00	0.00
TOTAL	2.81		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS

2015 DAILY RAINFALL DATA

USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
11/1/2015	0.00	0.00	0.00
11/2/2015	0.00	0.00	0.00
11/3/2015	0.00	0.00	0.00
11/4/2015	0.00	0.00	0.00
11/5/2015	0.01	0.01	0.01
11/6/2015	0.00	0.00	0.00
11/7/2015	0.00	0.00	0.00
11/8/2015	0.00	0.00	0.00
11/9/2015	0.00	0.00	0.00
11/10/2015	0.04	0.02	0.01
11/11/2015	0.56	0.09	0.01
11/12/2015	0.06	0.03	0.01
11/13/2015	0.03	0.02	0.01
11/14/2015	0.00	0.00	0.00
11/15/2015	0.00	0.00	0.00
11/16/2015	0.00	0.00	0.00
11/17/2015	0.00	0.00	0.00
11/18/2015	0.00	0.00	0.00
11/19/2015	0.00	0.00	0.00
11/20/2015	0.83	0.29	0.02
11/21/2015	0.00	0.00	0.00
11/22/2015	0.20	0.04	0.01
11/23/2015	0.11	0.08	0.01
11/24/2015	0.00	0.00	0.00
11/25/2015	0.00	0.00	0.00
11/26/2015	0.00	0.00	0.00
11/27/2015	0.00	0.00	0.00
11/28/2015	0.23	0.10	0.01
11/29/2015	0.00	0.00	0.00
11/30/2015	0.00	0.00	0.00
TOTAL	2.07		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

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CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS
 2015 DAILY RAINFALL DATA
 USGS METER AT MUDDY RIVER, BROOKLINE, MA

Date	Daily Rainfall (in.)	Maximum Intensity (in./hr)	Average Intensity (in./hr)
12/1/2015	0.13	0.07	0.02
12/2/2015	0.28	0.10	0.02
12/3/2015	0.01	0.01	0.01
12/4/2015	0.00	0.00	0.00
12/5/2015	0.00	0.00	0.00
12/6/2015	0.00	0.00	0.00
12/7/2015	0.00	0.00	0.00
12/8/2015	0.00	0.00	0.00
12/9/2015	0.00	0.00	0.00
12/10/2015	0.00	0.00	0.00
12/11/2015	0.00	0.00	0.00
12/12/2015	0.00	0.00	0.00
12/13/2015	0.00	0.00	0.00
12/14/2015	0.39	0.20	0.02
12/15/2015	0.20	0.11	0.02
12/16/2015	0.00	0.00	0.00
12/17/2015	0.49	0.10	0.01
12/18/2015	0.04	0.01	0.01
12/19/2015	0.00	0.00	0.00
12/20/2015	0.00	0.00	0.00
12/21/2015	0.00	0.00	0.00
12/22/2015	0.24	0.07	0.01
12/23/2015	0.64	0.21	0.02
12/24/2015	0.21	0.15	0.02
12/25/2015	0.01	0.01	0.01
12/26/2015	0.00	0.00	0.00
12/27/2015	0.26	0.08	0.01
12/28/2015	0.00	0.00	0.00
12/29/2015	1.10	0.48	0.02
12/30/2015	0.05	0.02	0.01
12/31/2015	0.09	0.04	0.01
TOTAL	4.14		

Notes:

Rainfall was measured in ten minute intervals

Shaded Data denotes CSO discharge.

APPENDIX II

January 2015 Daily Rainfall and Combined Sewer Overflows

January	Rain Gauges			Alewife Brook					Charles River			Total	
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017		
	(in)	(in)	(in)	Foch St. @ Alewife Brook	Mass Ave. @ Alewife Brook	Columbus @ Mass Ave. Alewife Brook	Concord Ave @ Rotary Alewife Brook	Sherman St. Alewife Brook	Lowell St. @ Mt. Auburn St Charles River	Hawthorne St. @ Memorial Dr. Charles River	Edwin Land Blvd. @ Binney St. Charles River		(GPD)
1	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	N/A	0.64	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	N/A	0.53	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	N/A	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	N/A	0.15	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	N/A	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	N/A	0.16	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	N/A	0.64	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	N/A	0	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	N/A	0.04	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	N/A	0.43	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	N/A	0.01	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	N/A	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	N/A	0.03	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	N/A	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	N/A	2.69	2.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

March 2015 Daily Rainfall and Combined Sewer Overflows

March	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Alewife Brook	Mass Ave. @ Alewife Alewife Brook	Columbus @ Mass Ave. Alewife Brook	Concord Ave @ Rotary Alewife Brook	Sherman St. Alewife Brook	Lowell St. @ Mt. Auburn St Charles River	Hawthorne St. @ Memorial Dr. Charles River	Edwin Land Blvd. @ Binney St. Charles River	
1	N/A	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	N/A	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	N/A	0.05	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	N/A	0.26	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	N/A	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	N/A	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	N/A	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	N/A	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	N/A	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	N/A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	N/A	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	N/A	0.08	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	N/A	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.98	0.62	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.23	0.24	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.18	0.08	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.39	2.44	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

April 2015 Daily Rainfall and Combined Sewer Overflows

April	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001 Foch St. @ Alewife Alewife Brook	CAM 002 Mass Ave. @ Alewife Alewife Brook	CAM 401B Columbus @ Mass Ave. Alewife Brook	CAM 004 Concord Ave @ Rotary Alewife Brook	401A Sherman St. Alewife Brook	CAM 005 Lowell St. @ Mt. Auburn St Charles River	CAM 007 Hawthorne St. @ Memorial Dr. Charles River	CAM 017 Edwin Land Blvd. @ Binney St. Charles River	
	(in)	(in)	(in)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.35	0.27	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.03	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.27	0.21	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.22	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.11	0.10	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.05	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.82	0.81	0.77	0.00	129,800.00	0.00	370,580.00	0.00	0.00	0.00	0.00	500,380.00
21	0.63	0.61	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.07	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.07	0.10	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		2.33	2.54	0.00	129,800.00	0.00	370,580.00	0.00	0.00	0.00	0.00	500,380.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

May 2015 Daily Rainfall and Combined Sewer Overflows

May	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Brook (GPD)	Mass Ave. @ Alewife Brook (GPD)	Columbus @ Mass Ave. Alewife Brook (GPD)	Concord Ave @ Rotary Alewife Brook (GPD)	Sherman St. Alewife Brook (GPD)	Lowell St. @ Mt. Auburn St Charles River (GPD)	Hawthorne St. @ Memorial Dr. Charles River (GPD)	Edwin Land Blvd. @ Binney St. Charles River (GPD)	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.03	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.28	0.23	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	1.40	1.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.73	1.29	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
 Charles River outfalls CAM009 and CAM011 are temporarily plugged
 CAM 400 Permanently closed on March 31, 2011

June 2015 Daily Rainfall and Combined Sewer Overflows

June	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Brook (GPD)	Mass Ave. @ Alewife Brook (GPD)	Columbus @ Mass Ave. Alewife Brook (GPD)	Concord Ave @ Rotary Alewife Brook (GPD)	Sherman St. Alewife Brook (GPD)	Lowell St. @ Mt. Auburn St Charles River (GPD)	Hawthorne St. @ Memorial Dr. Charles River (GPD)	Edwin Land Blvd. @ Binney St. Charles River (GPD)	
1	0.66	0.59	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.85	0.88	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.13	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.03	0.23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.51	0.43	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	1.84	1.38	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	1.81	1.17	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.92	4.87	4.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

July 2015 Daily Rainfall and Combined Sewer Overflows

July	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Brook	Mass Ave. @ Alewife Brook	Columbus @ Mass Ave. Alewife Brook	Concord Ave @ Rotary Alewife Brook	Sherman St. Alewife Brook	Lowell St. @ Mt. Auburn St Charles River	Hawthorne St. @ Memorial Dr. Charles River	Edwin Land Blvd. @ Binney St. Charles River	
1	0.52	0.41	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.03	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.41	1.11	1.38	0.00	145,590.00	0.00	1,647,020.00	0.00	0.00	0.00	0.00	1,792,610.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.03	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.20	0.24	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.25	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		1.97	2.30	0.00	145,590.00	0.00	1,647,020.00	0.00	0.00	0.00	0.00	1,792,610.00

Alewife Brook outfall CAM002B is temporarily plugged
 Charles River outfalls CAM009 and CAM011 are temporarily plugged
 CAM 400 Permanently closed on March 31, 2011

August 2015 Daily Rainfall and Combined Sewer Overflows

August	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001 Foch St. @ Alewife Brook	CAM 002 Mass Ave. @ Alewife Brook	CAM 401B Columbus @ Mass Ave. Alewife Brook	CAM 004 Concord Ave @ Rotary Alewife Brook	401A Sherman St. Alewife Brook	CAM 005 Lowell St. @ Mt. Auburn St Charles River	CAM 007 Hawthorne St. @ Memorial Dr. Charles River	CAM 017 Edwin Land Blvd. @ Binney St. Charles River	
	(in)	(in)	(in)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	
1	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.70	0.36	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.67	0.66	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.08	0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.25	0.44	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.06	0.02	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.82	1.58	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

September 2015 Daily Rainfall and Combined Sewer Overflows

September	Rain Gauges			Alewife Brook					Charles River			Total (GPD)
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001 Foch St. @ Alewife Brook	CAM 002 Mass Ave. @ Alewife Brook	CAM 401B Columbus @ Mass Ave. Alewife Brook	CAM 004 Concord Ave @ Rotary Alewife Brook	401A Sherman St. Alewife Brook	CAM 005 Lowell St. @ Mt. Auburn St Charles River	CAM 007 Hawthorne St. @ Memorial Dr. Charles River	CAM 017 Edwin Land Blvd. @ Binney St. Charles River	
	(in)	(in)	(in)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.25	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.42	0.40	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.15	0.06	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.08	0.66	0.11	0.00	0.00	0.00	128,670.00	0.00	0.00	0.00	0.00	128,670.00
30	4.01	3.89	3.06	1,222.84	1,983,420.00	340,980.40	11,753,170.00	1,226,400.00	192,014.00	31,896.44	1,830,000.00	17,359,103.68
Total	4.95	5.22	4.32	1,222.84	1,983,420.00	340,980.40	11,881,840.00	1,226,400.00	192,014.00	31,896.44	1,830,000.00	17,263,863.24

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

October 2015 Daily Rainfall and Combined Sewer Overflows

October	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001 Foch St. @ Alewife Brook	CAM 002 Mass Ave. @ Alewife Brook	CAM 401B Columbus @ Mass Ave. Alewife Brook	CAM 004 Concord Ave @ Rotary Alewife Brook	401A Sherman St. Alewife Brook	CAM 005 Lowell St. @ Mt. Auburn St Charles River	CAM 007 Hawthorne St. @ Memorial Dr. Charles River	CAM 017 Edwin Land Blvd. @ Binney St. Charles River	
	(in)	(in)	(in)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	
1	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.10	0.12	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.01	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.33	0.36	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.05	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.08	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.03	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.51	0.00	0.00	0.00	0.00	441,450.00	0.00	0.00	0.00	0.00	441,450.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.63	0.49	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	1.36	1.22	1.10	0.00	0.00	0.00	633,170.00	0.00	0.00	0.00	0.00	633,170.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.59	3.03	2.81	0.00	0.00	0.00	1,074,620.00	0.00	0.00	0.00	0.00	1,074,620.00

Alewife Brook outfall CAM002B is temporarily plugged
 Charles River outfalls CAM009 and CAM011 are temporarily plugged
 CAM 400 Permanently closed on March 31, 2011

November 2015 Daily Rainfall and Combined Sewer Overflows

November	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Brook (GPD)	Mass Ave. @ Alewife Brook (GPD)	Columbus @ Mass Ave. Alewife Brook (GPD)	Concord Ave @ Rotary Alewife Brook (GPD)	Sherman St. Alewife Brook (GPD)	Lowell St. @ Mt. Auburn St Charles River (GPD)	Hawthorne St. @ Memorial Dr. Charles River (GPD)	Edwin Land Blvd. @ Binney St. Charles River (GPD)	
1	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.03	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.60	0.34	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.08	0.08	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.02	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	1.01	0.88	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.29	0.18	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.03	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.25	0.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.32	1.73	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

December 2015 Daily Rainfall and Combined Sewer Overflows

December	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001 Foch St. @ Alewife Brook	CAM 002 Mass Ave. @ Alewife Alewife Brook	CAM 401B Columbus @ Mass Ave. Alewife Brook	CAM 004 Concord Ave @ Rotary Alewife Brook	401A Sherman St. Alewife Brook	CAM 005 Lowell St. @ Mt. Auburn St Charles River	CAM 007 Hawthorne St. @ Memorial Dr. Charles River	CAM 017 Edwin Land Blvd. @ Binney St. Charles River	
	(in)	(in)	(in)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	(GPD)	
1	N/A	0.09	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	N/A	0.16	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	N/A	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	N/A	0.36	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	N/A	0.15	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	N/A	0.55	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	N/A	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	N/A	0.30	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	N/A	0.62	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	N/A	0.25	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	N/A	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	N/A	0.28	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	N/A	1.13	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	N/A	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	N/A	0.06	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	3.99	4.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Alewife Brook outfall CAM002B is temporarily plugged
Charles River outfalls CAM009 and CAM011 are temporarily plugged
CAM 400 Permanently closed on March 31, 2011

Month	Rain Gauges			Alewife Brook					Charles River			Total
	Cambridge DPW Cambridge, MA	USGS Fresh Pond	Muddy River Brookline, MA	CAM 001	CAM 002	CAM 401B	CAM 004	401A	CAM 005	CAM 007	CAM 017	
	(in)	(in)	(in)	Foch St. @ Alewife Alewife Brook	Mass Ave. @ Alewife Alewife Brook	Columbus @ Mass Ave. Alewife Brook	Concord Ave @ Rotary Alewife Brook	Sherman St. Alewife Brook	Lowell St. @ Mt. Auburn St Charles River	Hawthorne St. @ Memorial Dr. Charles River	Edwin Land Blvd. @ Binney St. Charles River	
January	N/A	2.69	2.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
February	N/A	2.44	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
March	1.39	2.44	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
April	2.62	2.33	2.54	0.00	129,800.00	0.00	0.00	0.00	0.00	0.00	0.00	129,800.00
May	1.73	1.29	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
June	5.92	4.87	4.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
July	2.48	1.97	2.30	0.00	145,590.00	0.00	1,647,020.00	0.00	0.00	0.00	0.00	1,792,610.00
August	1.82	1.58	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
September	4.95	5.22	4.32	1,222.840	1,983,420.00	340,980.40	11,881,840.00	1,226,400.00	192,014.00	31,896.44	1,830,000.00	17,455,877.24
October	2.59	3.03	2.81	0.00	0.00	0.00	1,074,620.00	0.00	0.00	0.00	0.00	1,074,620.00
November	2.32	1.73	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
December	N/A	3.99	4.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	25.82	33.58	33.26	1,222.84	2,258,810.00	340,980.40	14,603,480.00	1,226,400.00	192,014.00	31,896.44	1,830,000.00	20,452,907.24

APPENDIX III

Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Stefan Russakow, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery; Kelly Coughlin; David Parker; Wenley Jiang; Nadine Smoske
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Chris Neil, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

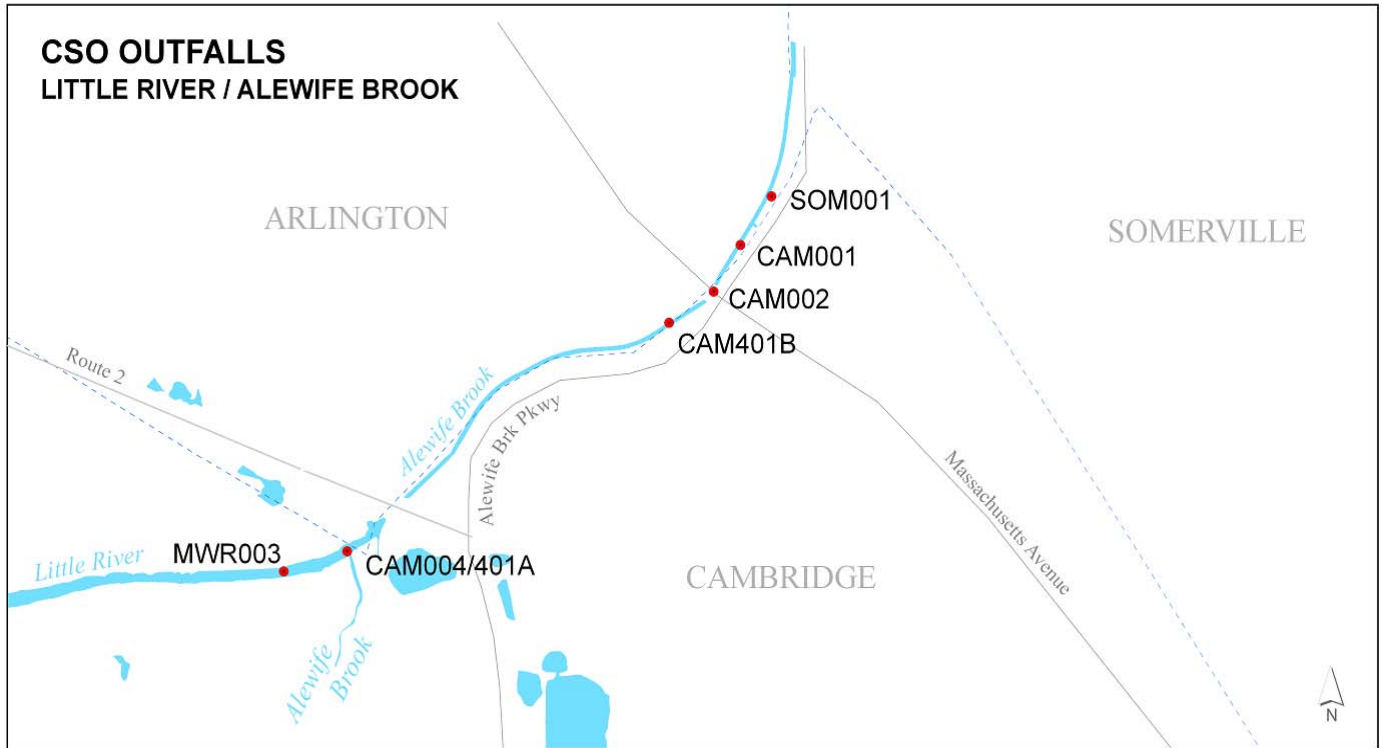
DATE: April 21, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM401B on April 21, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that 401B was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Stefan Russakow, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery; Kelly Coughlin; David Parker; Wenley Jiang; Nadine Smoske
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Chris Neil, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

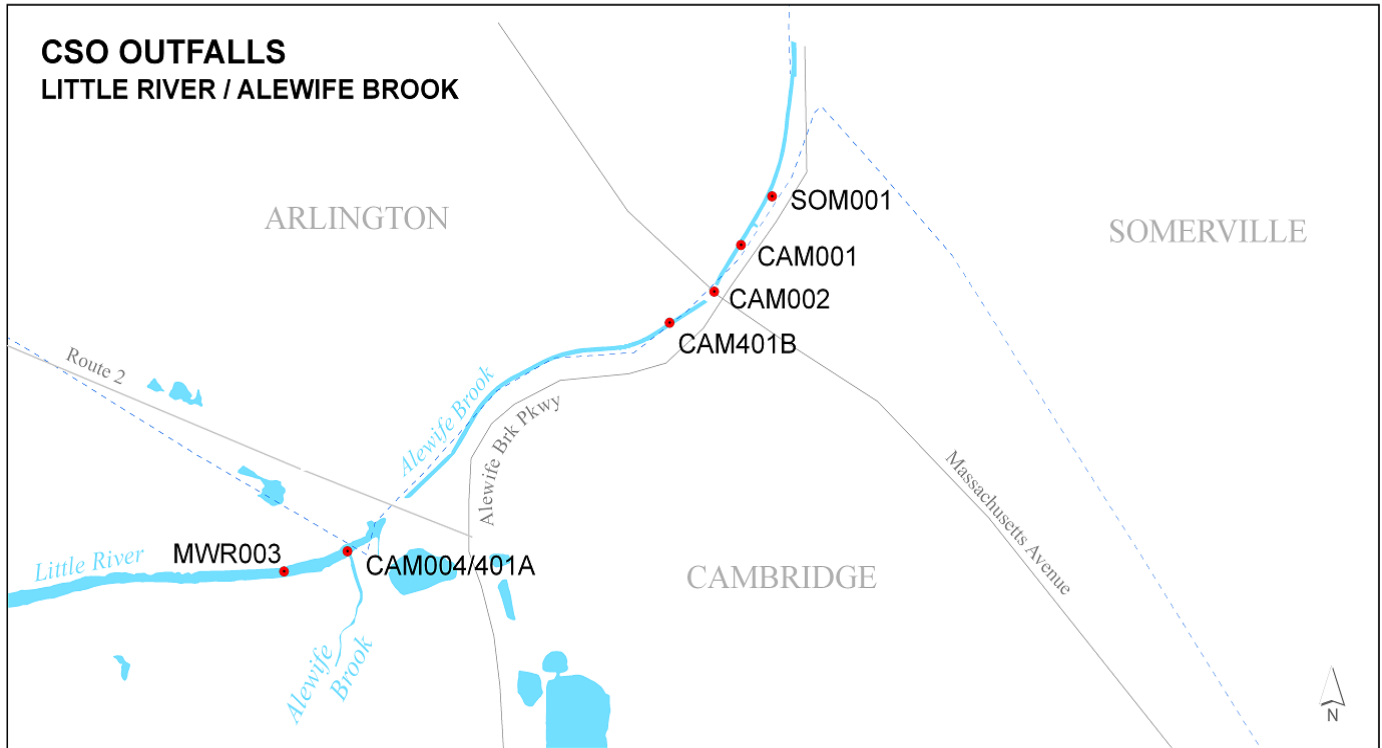
DATE: June 1, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM401B on May 31, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that 401B was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Stefan Russakow, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery; Kelly Coughlin; David Parker; Wenley Jiang; Nadine Smoske
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Chris Neil, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

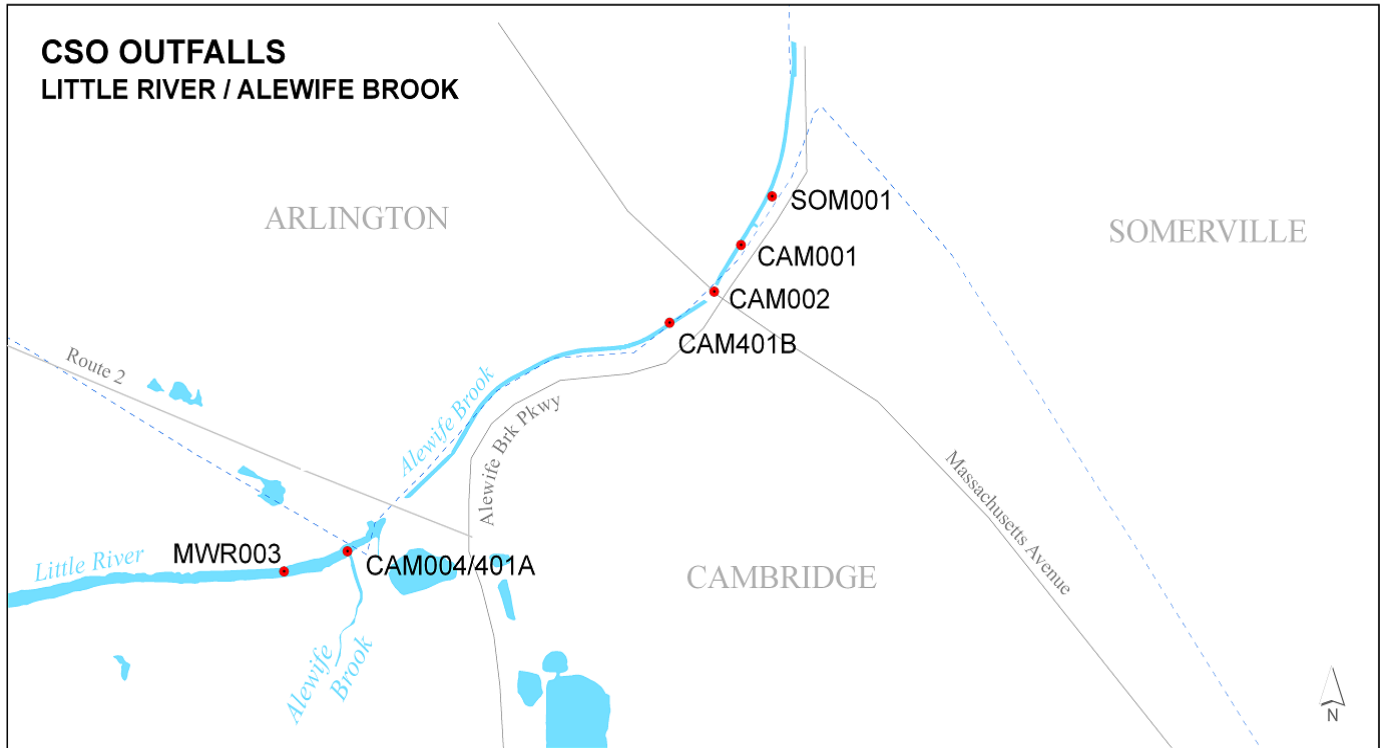
DATE: June 29, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM401B on June 28, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that 401B was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Angela Braun, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery; Kelly Coughlin; David Parker; Wenley Jiang; Nadine Smoske
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Chris Neil, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

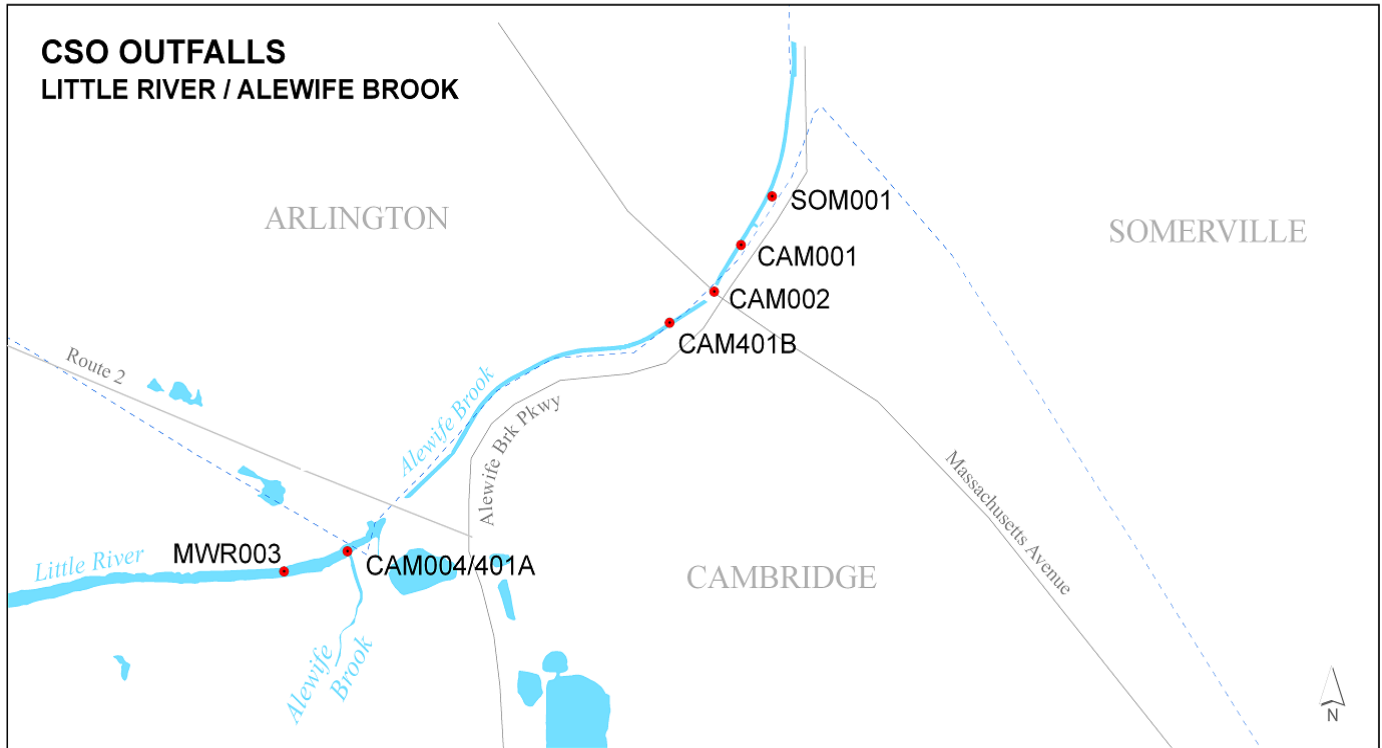
DATE: July 10, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM401B on July 10, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Angela Braun, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery; Kelly Coughlin; David Parker; Wenley Jiang; Nadine Smoske
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Chris Neil, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

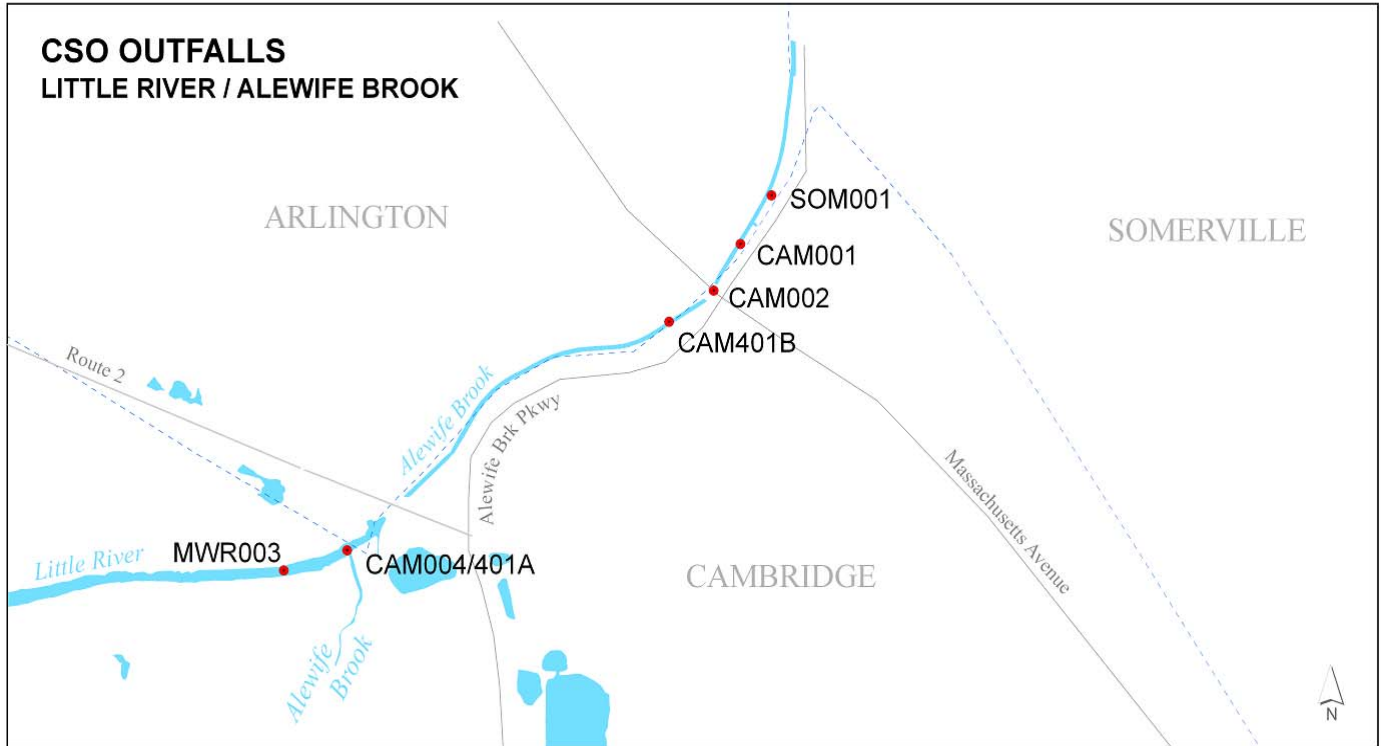
DATE: September 30, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 and CAM401B on September 30, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

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CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
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Angela Braun, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery, David Parker, David Wu, Nicole Johnson, Wenley Jiang, Wendy Leo, Nadine Smoske, Mark Sullivan
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox, Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson, Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

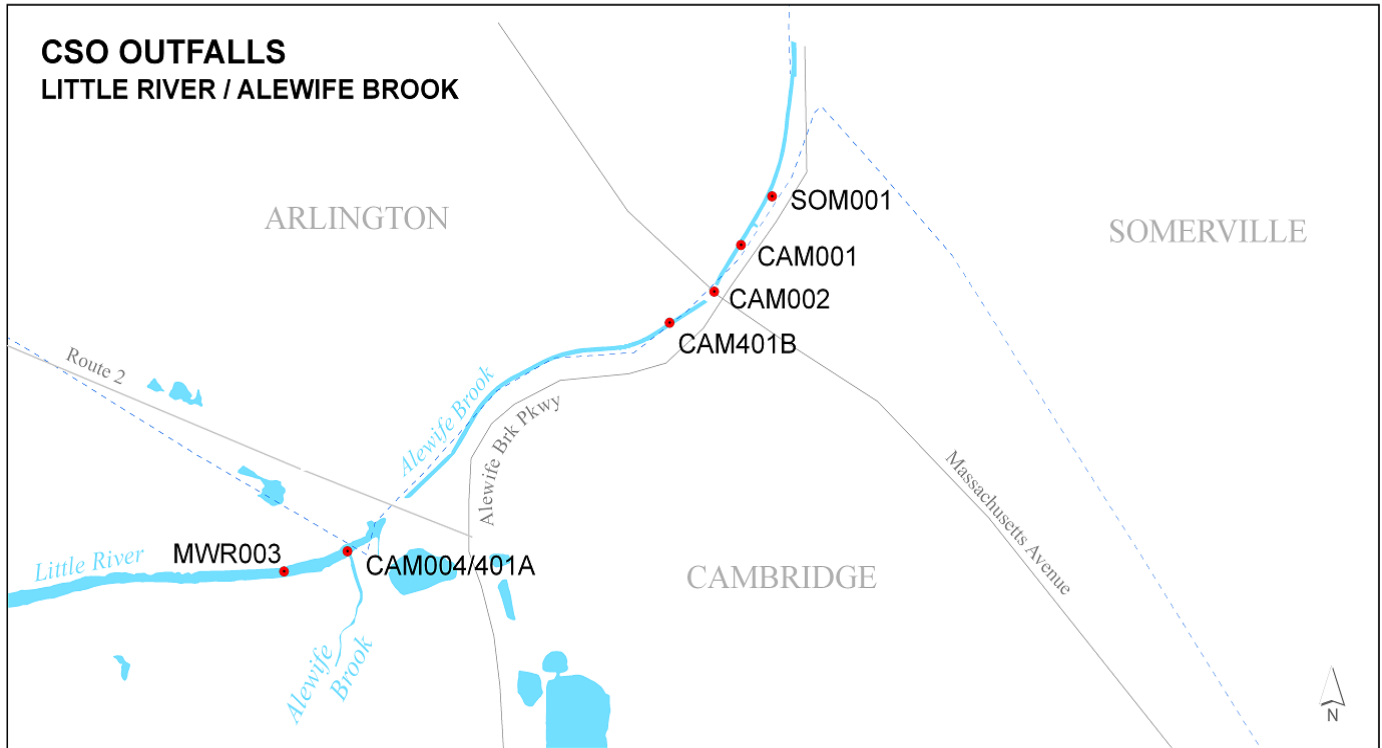
DATE: October 29, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on October 29, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook





Notice Alert: CSO Activation in Alewife Brook

**TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
Christine Connolly Bongiorno, Director, Arlington Department of Public Health
Angela Braun, Director, Belmont Department of Public Health
Kevin Brander, Department of Environmental Protection
Todd Borci, United States Environmental Protection Agency
William Walsh-Rogalski, United States Environmental Protection Agency**

FROM: James Wilcox, Cambridge DPW

**CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
MWRA – Ria Convery, David Parker, David Wu, Nicole Johnson, Wenley Jiang, Wendy Leo, Nadine Smoske, Mark Sullivan
Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox, Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson, Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano**

RE: Notice Alert: CSO Activation in Alewife Brook

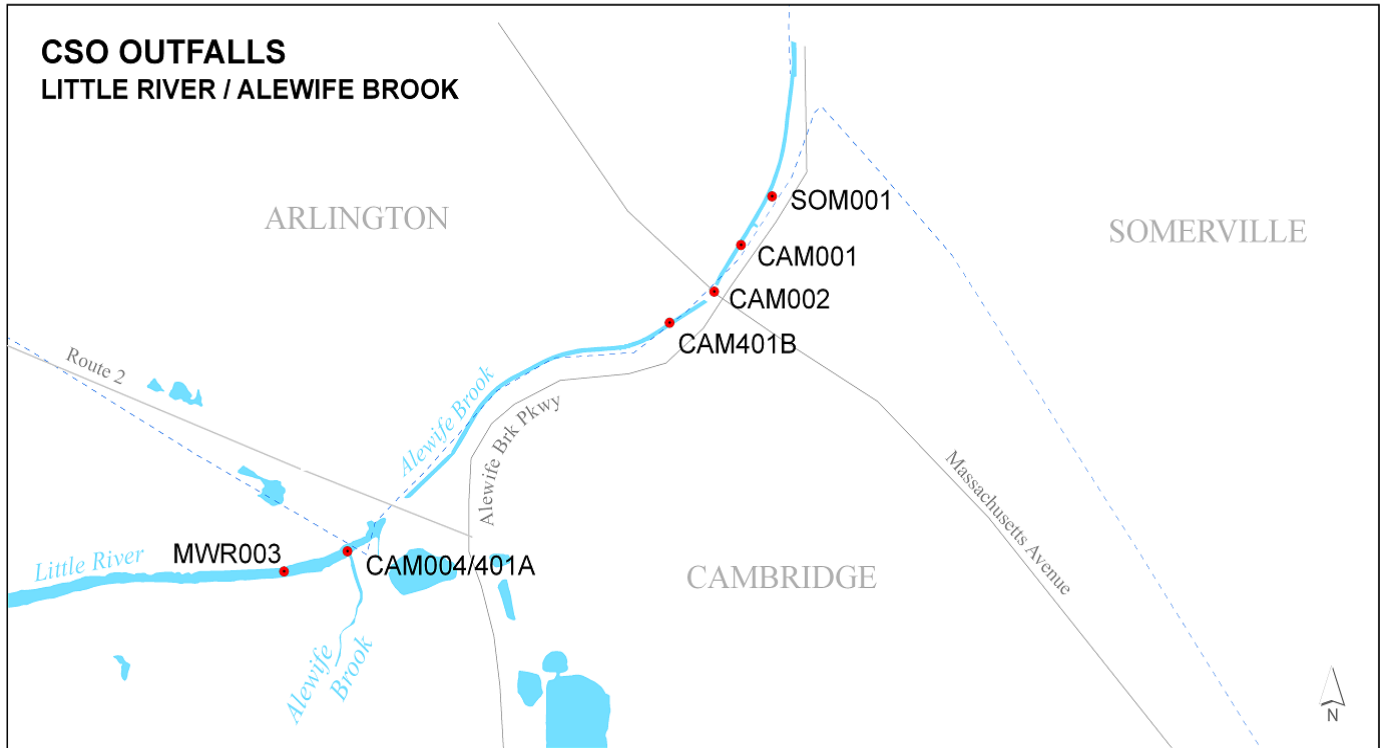
DATE: November 20, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on November 20, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

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Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
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William Walsh-Rogalski, United States Environmental Protection Agency

FROM: James Wilcox, Cambridge DPW

CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
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Town of Arlington – Michael Rademacher, DPW Director
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City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox, Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson, Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano

RE: **Notice Alert: CSO Activation in Alewife Brook**

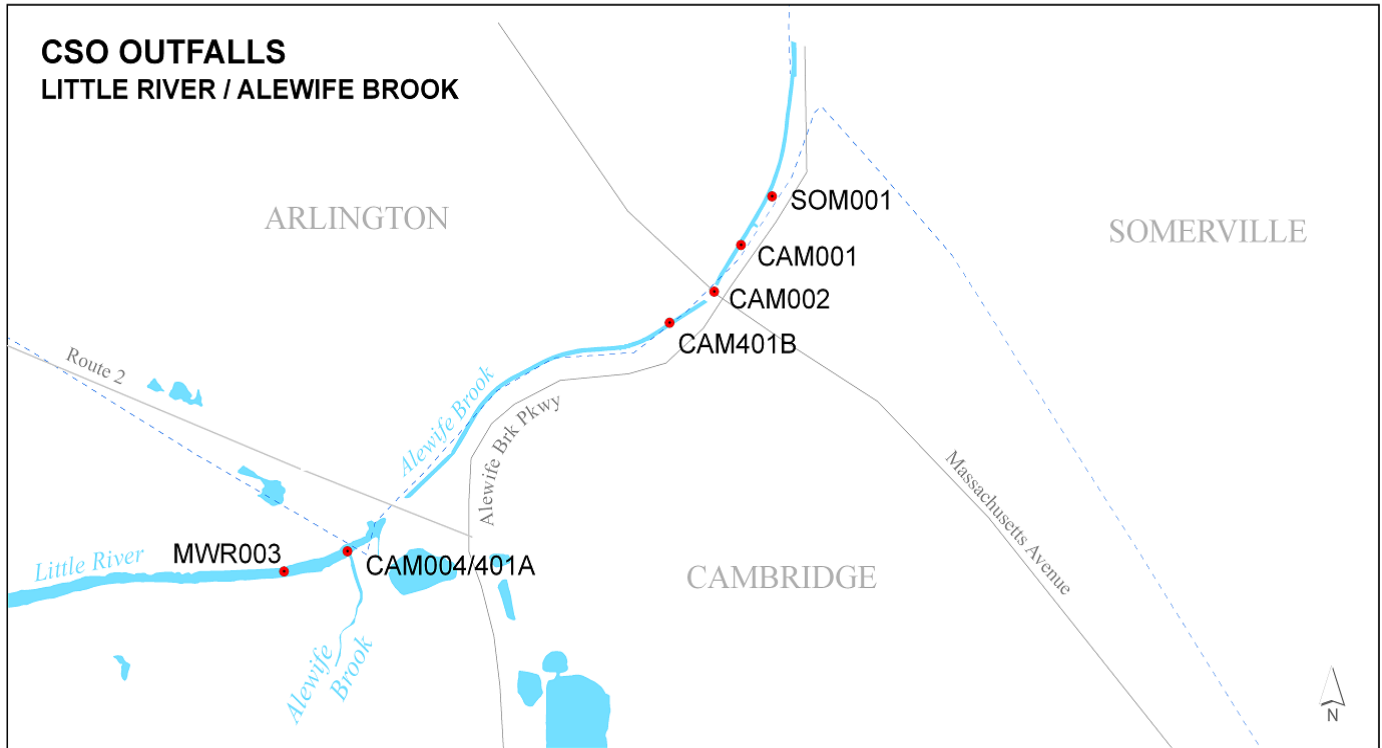
DATE: December 15, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on December 14 and 15, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

Portions of Cambridge and Somerville are served by combined stormwater and sanitary sewer systems, common in older cities. There are seven CSO outfalls on Alewife Brook (see the attached map for locations) which discharge untreated CSO (a mixture of wastewater and stormwater) during moderate and heavy rainfall to relieve the system and prevent sewer backups into homes, businesses, and streets. In addition, bordering communities also have separate drainage pipes that collect stormwater runoff and carry it to the brook. Discharges from CSOs and from separate stormwater pipes include bacteria and other pathogens, oxygen-demanding pollutants, solids and other contaminants. Public health officials recommend avoiding contact with the brook during and for 48 hours following rain storms, as there may be increased health risks during these periods. Contact with floodwaters should also be avoided as they may contain similar contaminants and pose associated health risks. Clean up information following a flood is available on the MA Department of Environmental Protection web site at: <http://www.mass.gov/dep/floodcleanup.htm> For real-time water data at Fresh Pond Reservoir, you can view the United States Geological Survey National Water System website at: <http://waterdata.usgs.gov/ma/nwis> Please contact Catherine Daly Woodbury at 617-349-4818 or James Wilcox at 617-349-6426 if you have any questions.

CSO Outfalls along the Little River/Alewife Brook



Notice Alert: CSO Activation in Alewife Brook

**TO: EkOngKar Singh Khalsa, Executive Director, Mystic River Watershed Association
Patrick Herron, Mystic Monitoring Network Director, Mystic River Watershed Association
Sam Lipson, Director, Environmental Health Unit, Cambridge Dept. of Public Health
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FROM: James Wilcox, Cambridge DPW

**CC: City of Somerville - Richard Willette, DPW Director of Operations; Vithal Deshpande, Env. Coord.
Friends of Alewife Reservation – Ellen Mass
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Representative Denise Provost
Mystic River Watershed Association – Patrick Herron, Beth MacBlane, Kim Provo
Town of Arlington – Michael Rademacher, DPW Director
Town of Belmont – Glenn Clancy, Director Department of Community Development
City of Cambridge Department of Public Works – Owen O’Riordan, Kathy Watkins, James Wilcox,
Catherine Daly Woodbury, Jeya Niranjana, Brian McLane, Rebecca Fuentes, Wendy Robinson,
Kelly Dunn, Dan Riviello, Mike Abcunas, Catherine Mitrano**

RE: Notice Alert: CSO Activation in Alewife Brook

DATE: December 18, 2015

In accordance with the conditions of the Department of Environmental Protection's (DEP) Alewife Brook/Upper Mystic River Variance we are hereby notifying you that a Combined Sewer Overflow (CSO) occurred at CAM002 on December 17, 2015 and discharged into the Alewife Brook. The Variance approved workplan requires the Cambridge Department of Public Works (DPW) to notify local health agents, DEP, EPA and MRWA within 24 hours of when a CSO event occurs. It was determined that CAM002 was the most active outfall and would be the most suitable indicator of CSO activity along the Alewife Brook. This notification does not reflect the absence of any activation at other sites. Rather, the notice is intended to be confirmation to users of the resource that untreated sewage discharges to the Brook/River have occurred.

The water quality in Alewife Brook is often impaired due to bacterial and other pollutants from a number of sources, including stormwater runoff, CSOs and cross connections between sanitary sewers and stormwater drains. Water quality in the brook during both wet and dry weather generally fails to meet state bacteria standards for fishing and swimming. Contaminant sources originate in the watershed communities of Belmont, Arlington, Cambridge and Somerville, all of which are undertaking programs to identify and control the sources of pollution to the brook.

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CSO Outfalls along the Little River/Alewife Brook

