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Annual Sewage Notification Report 2022

Prepared by: Bureau of Water Resources

Massachusetts Department of Environmental Protection

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I. Overview of the Sewage Notification regulations

A. Background

In January 2021, Chapter 322 of the Acts of 2020, *An Act promoting awareness of sewage in public wasters*, was signed into law. This law ensures that the public knows when untreated sewage flows into Massachusetts waters, including combined sewer overflows (CSOs). In January 2022, the Massachusetts Department of Environmental Protection (MassDEP) promulgated regulations to implement the provisions of the Act, titled Notification Requirements to Promote Public Awareness of Sewage Pollution (314 CMR 16.00). These sewage notification regulations require wastewater utilities and systems to notify the public of sewage discharges and overflows. The statute includes a requirement for MassDEP to issue a report providing a summary of all outfall discharge activity reported for the previous calendar year. This report fulfills MassDEP's annual reporting requirement for the period from July 6, 2022, when the Public Notification requirements of the Act took effect, until the end of calendar year 2022.

Sanitary sewer collection systems are made up of pipes and pumps that transport wastewater from homes and industries to wastewater treatment plants. CSOs occur in cities and towns where the sanitary sewer and stormwater systems are combined. Newer sewer systems were built with separate systems for sanitary and stormwater flows. However, older cities across the Commonwealth may still have combined sewer systems designed to carry both sanitary sewage and stormwater in the same pipes. Combined sewer systems have outfall pipes that allow overloaded systems to discharge into bodies of water. When there is not a lot of stormwater, this mix is transported to a wastewater treatment plant where it is treated before discharge. However, after heavy rainfall or snowmelt, stormwater and sewage overload the system, and a mixture of stormwater and wastewater is released through the CSO outfalls. Without CSOs, this mix would back up into homes, businesses, and public streets.

In addition to CSOs, there are other ways in which untreated or partially treated sewage can be released into the environment. At the wastewater treatment plant, wastewater which has been partially treated may be discharged if part of the treatment system is not operational. Additionally, some facilities connected to combined sewer systems practice "blending," where the facility intentionally diverts a portion of their flow around secondary treatment units during wet weather conditions. This allows more flow to enter the treatment plan and receive at least primary treatment, thereby minimizing water quality impacts of CSOs. Sanitary sewer overflows (SSOs) are any unauthorized release of wastewater from a sanitary sewer system. SSOs can be caused by issues such as high flow through the system and pump station failure.

CSO discharges are regulated by MassDEP and US EPA in accordance with the federal Clean Water Act, the state Clean Waters Act, state and federal CSO policies and the State Water Quality Standards. There are 19 CSO permittees with 195 remaining CSO outfalls. The CSO permittees are Boston Water & Sewer Commission, City of Cambridge, City of Chelsea, City of Chicopee, City of Fall River, City of Fitchburg, City of Gloucester, Greater Lawrence Sanitary District, City of Haverhill, City of Holyoke, Lowell Regional Wastewater Utility, Lynn Water & Sewer Commission, Massachusetts Water Resources Authority, Town of Montague, City of New Bedford, Somerville Department of Public Works, Springfield Water & Sewer

Commission, City of Taunton, and City of Worcester. Each of these CSO permittees must implement specified control measures and implement a Long-Term Control Plan to limit the duration and impact of CSO discharges. To learn more, visit MassDEP's Sanitary Sewer Systems & Combined Sewer Overflows webpage.

B. Overview of regulatory requirements

The sewage notification regulations were designed to better inform the public of CSOs and other discharges of raw or untreated sewage to promote awareness and protect public health. The regulations require multiple types of public notification for reportable events, including public advisory notifications via email or text, signage at public access points potentially affected by CSOs, updates to the discharger's website, and reporting into a centralized MassDEP sewage notification database. Reports into MassDEP's database are accessible by the public.

Events which require public notification and entry into the database are:

Combined Sewer Overflows (CSOs)
A sewer system designed to collect and convey storm water runoff and wastewater in shared piping is a combined sewer system. A CSO is any discharge of untreated or partially treated wastewater into a water body from an outfall connected to a combined sewer system.

Partially treated discharges
A partially treated discharge is defined in the regulations as a discharge through an outfall from a wastewater treatment facility where all or a portion of the flow is not conveyed through all treatment units, or where treatment units are bypassed due to a treatment unit failure. "Blended wastewater" is discharged when facilities connected to combined sewer systems intentionally divert a portion of their flow around secondary treatment units during wet weather conditions to allow more flow to enter the treatment plan and receive at least primary treatment, thereby minimizing water quality impacts of CSOs.

Sanitary Sewer Overflows (SSOs)
These regulations require reporting for SSO discharges that impact a body of water and result from three specific situations: discharge through a wastewater outfall, high flow conditions where peak flows cannot be conveyed to a wastewater treatment plant due to capacity constraints, or a wastewater pump station failure for a pump station designed for 1 million gallons per day (MGD) or greater.

> *"The Sewage Notification Regulations streamlined the message to the public by making it uniform from all permittees. In addition, GLSD now has 259 subscribers to its notification system, up by 15% since the regulations were adopted."*
>
> - Cheri Cousens, Executive Director, Greater Lawrence Sanitary District

"The Sewage Notification Bill and the reporting tool have been a game-changer in transparency. For the first time, the public can access data on the frequencies and volumes of sewage discharges that impact river systems and public health throughout the Commonwealth of Massachusetts. The dataset highlights the disproportionate burden on some communities, and the desperate need for investment in public infrastructure. We're proud to have partnered with the legislators, treatment plant operators, Massachusetts Department of Environmental Protection (MADEP), and other environmental advocates on this bill, regulations, and tool. DEP deserves kudos for getting this over the finish line and making the reporting system a reality."

– Patrick Herron, Executive Director, Mystic River Watershed Association

C. Environmental Justice communities

The sewage notification regulations include special requirements to ensure that Environmental Justice (EJ) populations can access important information about possible sewage pollution. This is especially relevant as communities with CSOs tend to also have high prevalence of EJ populations. All CSO outfalls for the 19 CSO permit holders are in municipalities with EJ populations. (See the MassDEP EJ map.) In the municipalities with a CSO outfall, 85% of the total population lives within an EJ block group. Public notifications are required to be translated for EJ groups with English language isolation. These notifications are required to be sent to a news organization that serves the EJ population. Signs at public access points potentially affected by CSOs are also required to provide access to translations for EJ groups with English language isolation.

II. Current program status

MassDEP has led multiple trainings for permittees, municipalities, and Boards of Health/Health Departments on the program's regulatory requirements and database, and has published documentation to promote compliance. The notification requirements in the sewage notification regulations (314 CMR 16.00) took effect on July 6, 2022. Starting on this date, dischargers were required to send public advisory notifications to all required contacts and subscribers, and to report events into the MassDEP database. Sewer authorities have submitted plans for issuing public notification and adhering to the regulatory requirements. MassDEP has reviewed these plans and is working with the sewer authorities to make updates as needed.

"MWRA UNDERSTANDS AND VALUES THE IMPORTANCE OF PROVIDING REAL-TIME INFORMATION ON COMBINED SEWER OVERFLOWS TO PROTECT PUBLIC HEALTH, AND IMPLEMENTED OUR RAPID NOTIFICATION PROGRAM IN 2016. MASS DEP'S SEWAGE NOTIFICATION PROGRAM FURTHER REINFORCES OUR GOALS FOR TRANSPARENCY."

Dr. Betsy Reilley, MWRA

III. Data overview – 2022

A. Database background

This section includes a review of the data in the MassDEP database for 2022. Reporting into the MassDEP database was required beginning on July 6, 2022, so the data displayed is for the months of July through December 2022.

The database contains two Report Classes which differ in the timing of their submittal. Public Notification Reports are submitted soon after the event. Verified Data Reports are submitted by the 15th of the month following the event and contain any updated information available at that time. Any report corrections are required to be submitted by permit holders before February 1 of each year as a correction to the Verified Data Report. To avoid double-counting events, the data presented in this annual report are from the Verified Data Reports. If a Public Notification Report is submitted but the permittee later learns that the event did not occur (i.e., a meter gave a false positive indication of activation) the permittee can report a retraction by submitting a Verified Data Report with a volume of 0 gallons. Retractions have been excluded from the data presented in this report.

The database categorizes events by Event Type, including CSO events, Partially Treated events, and SSO events. There are two types of CSO events: CSO – Treated, and CSO – Untreated. CSOs categorized as CSO – Treated include screening and disinfection before the overflow reaches a body of water. There are two types of Partially Treated events: Partially Treated – Blended and Partially Treated – Other. Both types of Partially Treated events discharge from the treatment plant outfall. Partially Treated – Blended events occur when a treatment plant that receives wastewater from a combined sewer system intentionally diverts a portion of the wastewater stream around secondary treatment during wet weather events to maximize flow to the plant. These events are reported as Partially Treated – Blended even if the discharge is at or below the same pollutant concentrations as numerical permit limits. Partially Treated – Other events occur when a portion of the waste stream is diverted around part of the treatment process due to equipment failure, or when necessary to conduct plant maintenance activities. There are three specific types of SSO events that are required to be reported under 314 CMR 16.00 for sanitary sewer overflows that reach a body of water: SSO – Discharge Through Wastewater Outfall, SSO – System Surcharging Under High Flow Conditions, and SSO – Failure of Pump Station or Associated Force Main.

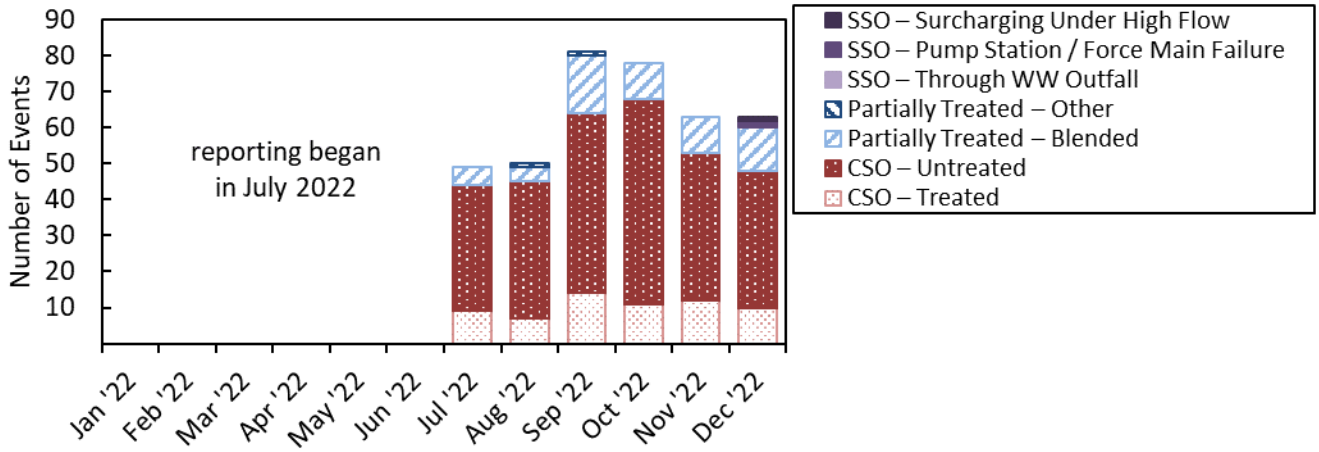
The data in the sections that follow are summarized by event. To display the data by event, reports from the database are grouped by the following fields: Permittee, Event Type, and Incident Date. Multiple reports may be associated with the same event. For example, if a CSO permit holder has an event in which multiple outfalls activate during the same day, a separate report is submitted for each outfall. In the sections that follow, reports with the same Permittee, Event Type, and Incident Date are summarized as one event.

From July through December of 2022, a total of 322 CSO treated and untreated events, 59 Partially Treated events, and 3 SSO events were reported. These events reported a total of 958,000,000 gallons of CSO discharge, 477,000,000 gallons of partially treated discharge from wastewater treatment facilities, and 439,000 gallons of SSO discharge into waterbodies of the Commonwealth. More detail regarding these discharges can be found below.

B. Frequency and volume by month

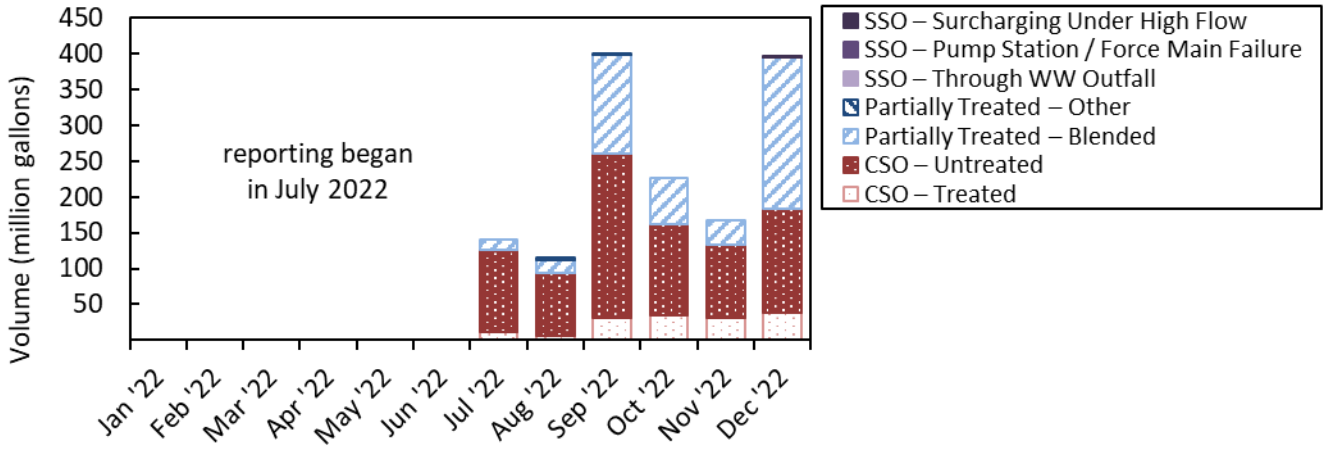
This section summarizes frequency and volume of sewage notification discharge events by month. The frequency of sewage notification events was lowest in July (49 total events) and August (50 total events) and highest in September (81 total events) and October (78 total events). This likely reflects the drought conditions that occurred throughout Massachusetts, particularly during the summer. See Figure 1 in which the frequency of reportable events is displayed by month. An event is determined by grouping reports from the same Permittee, Event Type, and Incident Date as one event. Multiple reports may be associated with the same event. See Tables A1 and A2 of Appendix A for more information.

Figure 1. Frequency of sewage notification events reported by month. Events are determined by grouping reports in the database by Permittee, Event Type, and Incident Date.



The lowest discharge volumes were reported in July and August. The highest discharge volumes were reported in September, which was dominated by CSO discharges (red dots), and December, which was dominated by both CSO discharges (red dots) and Partially Treated discharges (blue stripes). Both the frequency and volume of SSO discharges (solid purple) were lower than the frequency and volume of CSO and Partially Treated discharges for all months. See Figure 2 in which the total volume of the discharge or overflow is displayed by month and Table A3 of Appendix A for more information. When comparing number of events and volume, a month may have a relatively high number of events and a relatively low volume if the volume of each event was low. A month may have a relatively low number of events and a relatively high volume if the volume of some events was high.

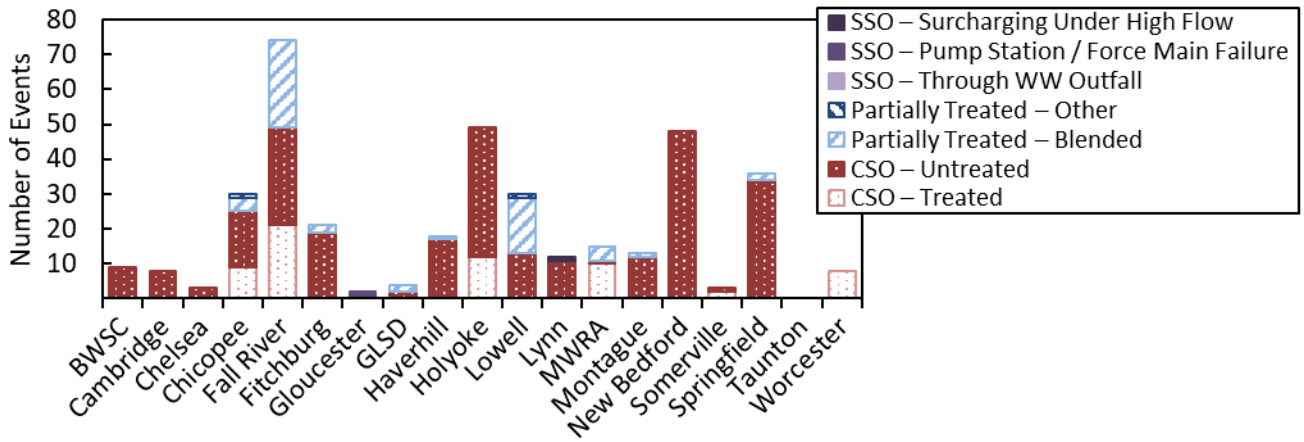
Figure 2. Discharge volumes reported by month.



C. Frequency and volume by CSO permit holder

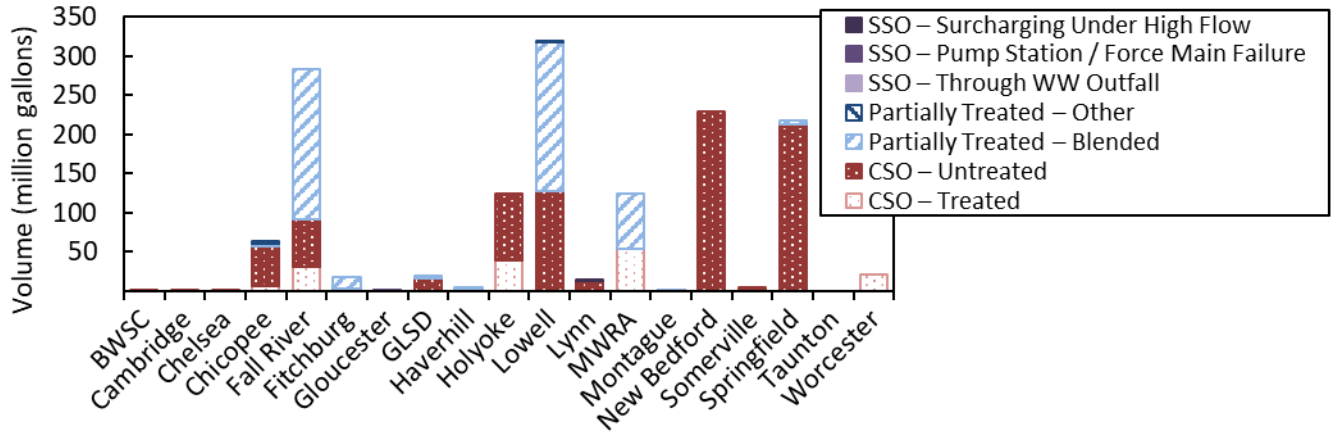
This section summarizes frequency and volume of sewage notification discharge events by CSO Permit holder. Sewage notification events by CSO permit holder are presented in Figure 3, in which reports from the same Permittee, Event Type, and Incident Date summarized as one event. Multiple reports may be associated with the same event. See Table A4 and A5 of Appendix A for more information.

Figure 3. Frequency of sewage notification events reported by CSO permit holder. Events are determined by grouping reports in the database by Permittee, Event Type, and Incident Date.



See Figure 4 in which the total volume of the discharge or overflow is displayed by CSO permit holder. When comparing number of events and volume, a discharger may have a relatively high number of events (Figure 3) and a relatively low volume (Figure 4) if the volume of each event was low. Conversely, permit holders with a relatively fewer number of events, but relatively higher volumes discharged more per event than other permit holders. Some permit holders reported events, but the total volume of the discharge is not visible in Figure 4; this is because the volume discharged for these permit holders was much smaller than the other permit holders. See Table A6 of Appendix A for more information.

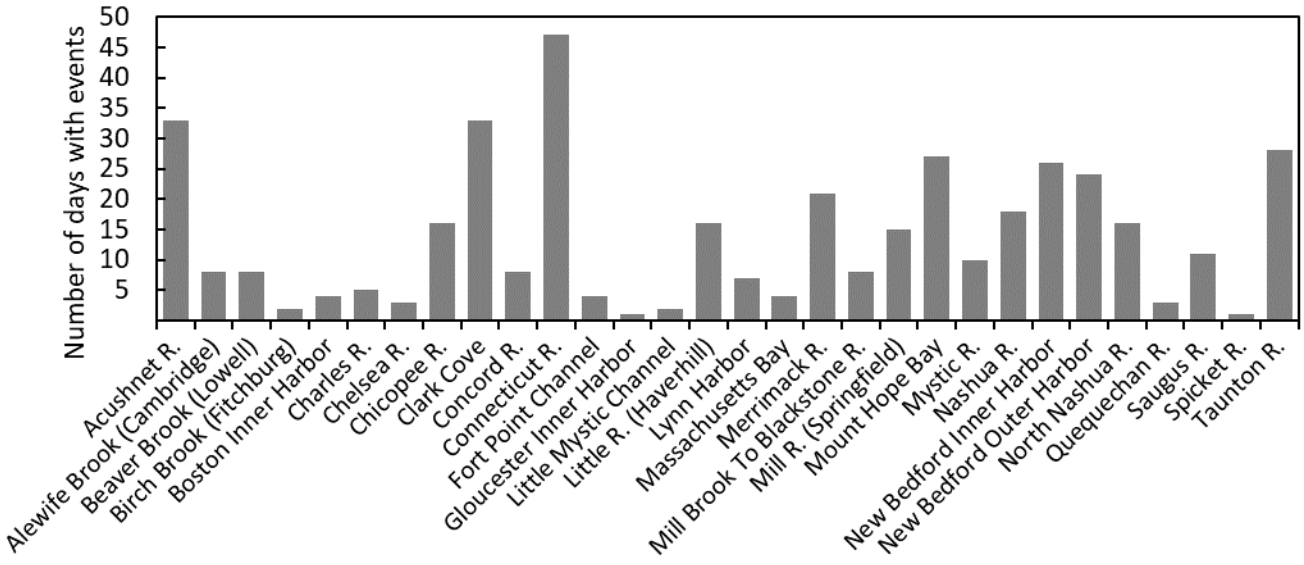
Figure 4. Discharge volumes reported by CSO permit holder in millions of gallon



D. Frequency and volume by waterbody

This section summarizes events by body of water. For a map of CSO outfalls, including waterbody, permit holder ("System Name"), and municipality, see the MassDEP CSO discharge map. The total number of days with sewage notification discharge events (Figure 5) does not necessarily correspond directly to the degree of impact to a waterbody. An event may impact water quality through only a portion of the body of water, depending on factors such as the volume of the discharge or overflow and size of the body of water. In contrast, an event may affect other bodies of water downstream of where the discharge or overflow occurred if, for example, the body of water is small or connects into another body of water after the discharge. Some bodies of water contain outfalls for multiple CSO permit holders. See Table A7 of Appendix for more information.

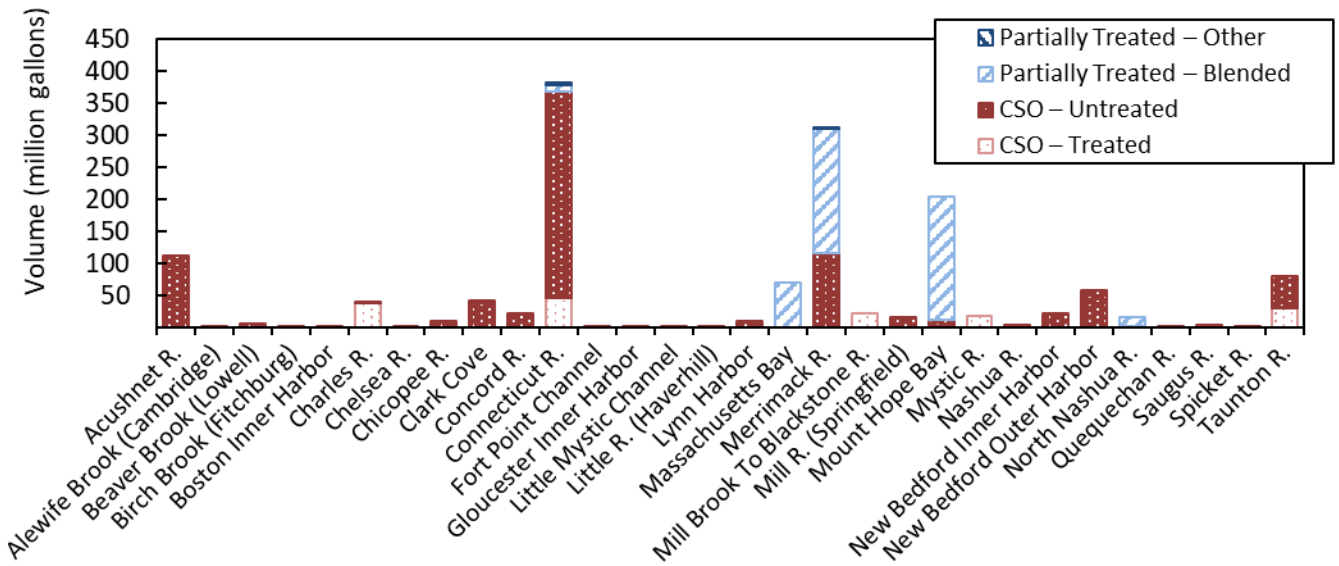
Figure 5. Number of days when one or more CSO or Partially Treated events were reported by body of water. The time period shown is the 118 days in 2022 after the reporting requirement began.



Total volume of CSO and Partially Treated discharges can be seen in Figure 6. It is more useful to consider both frequency and volume of discharge to a waterbody together. The size of the waterbody is

also important. For example, the impact of one million gallons discharged in a small waterbody may be higher than the same volume discharged into a larger waterbody. Some bodies of water have a visible number of days in Figure 5, but the volume is not visible in Figure 6; this is because the volume discharged for these bodies of water is much smaller than for the other bodies of water. See Table A7 of Appendix A for more information.

Figure 6. Discharge volumes for CSO and Partially Treated events by body of water.



"The sewage notification program is doing what we had hoped by highlighting and keeping the issue front and center of overflowing and failing wastewater infrastructure and the need to upgrade and fix it! In our own watershed it has focused attention on a long-standing failing treatment plant that is in dire need of upgrades and funding."

– Samantha Woods, Executive Director, North and South Rivers Watershed Association

E. Frequency and volume by municipality

This section summarizes events by the municipality in which they occurred. The municipality is not necessarily the owner of the outfall where the discharge occurred. Some municipalities contain outfalls for multiple CSO permit holders.

Some municipalities have a visible number of days (Figure 7) while the volume is not visible (Figure 8). This is because the volume discharged in these municipalities is much smaller than in the other municipalities. This is likely because the volume of each discharge event was low. Alternatively, a municipality may have a relatively low number of events and a relatively high volume if the volume of some events was high. See Table A8 of the Appendix for more information, including small discharge volumes.

Figure 7. Number of days when one or more events were reported by the municipality in which the discharge occurred. The municipality is not necessarily the owner of the discharge outfall. The time period shown is the 118 days in 2022 after the reporting requirement began.

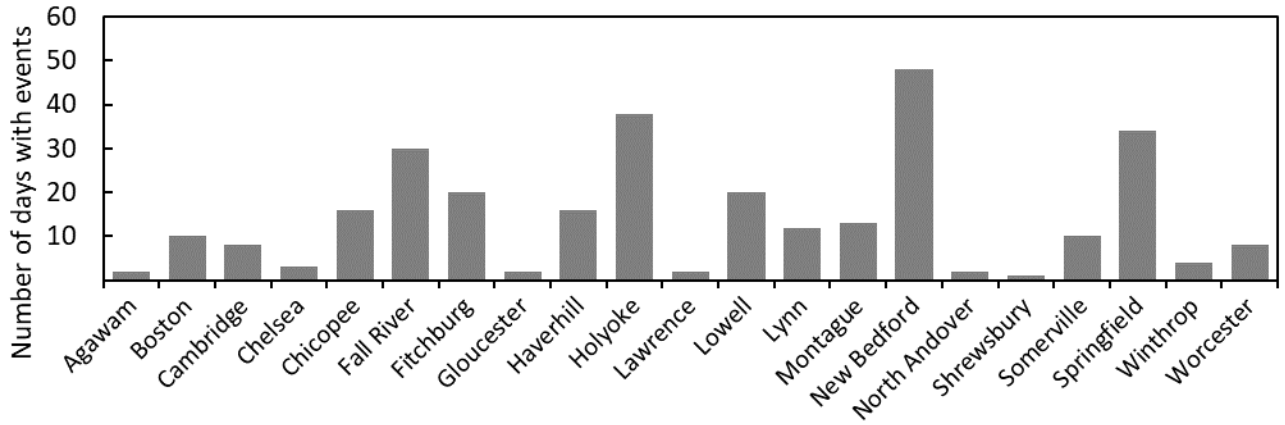
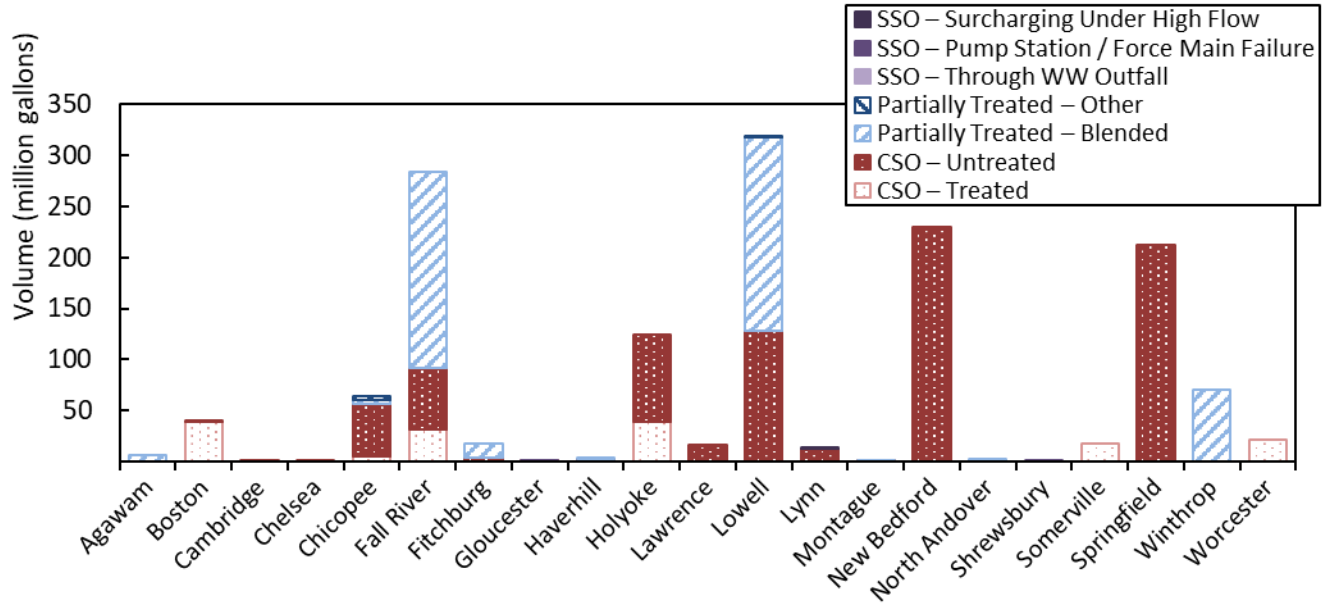


Figure 8. Discharge volumes for events by the municipality in which the discharge occurred. The municipality is not necessarily the owner of the discharge outfall.



IV. Summary

> *"Informing people when there is sewage in their local river helps keep them safe. We hope this program will also spur support for investments in desperately needed water infrastructure improvements to protect both public health and the environment. We appreciate MassDEP's hard work to get this new program up and running."*
>
> - Julia Blatt, Executive Director, Massachusetts Rivers Alliance

In 2022, the Sewage Notification regulations were promulgated and permit holders implemented the new public notification processes, including issuing notification emails and reporting into the MassDEP database. Other requirements, such as sign placement at public access points and final approval of public notification plans are still in progress. The program has already enabled greater public awareness of sewage pollution, as seen through the publication of news articles about CSO events in the Commonwealth. In future years, the reports collected in the database will enable easy tracking of efforts to reduce and eliminate CSO discharges.

Appendix A

The data shown in the Appendix is from Verified Data Reports submitted in 2022, starting from July 6, 2022 when the reporting requirement began.

Table A1. Number of reports by month.

	Jan '22	Feb '22	Mar '22	Apr '22	May '22	Jun '22	Jul '22	Aug '22	Sep '22	Oct '22	Nov '22	Dec '22	*Totals*
CSO – Treated							11	9	16	18	16	17	***87***
CSO – Untreated							187	171	252	221	166	155	***1152***
Partially Treated – Blended							5	4	16	10	10	15	***60***
Partially Treated – Other								1	1				***2***
SSO – Through WW Outfall													
SSO – Pump Station / Force Main Failure												2	***2***
SSO – Surcharging Under High Flow												1	***1***
Totals							***203***	***185***	***285***	***249***	***192***	***190***	***1304***

Table A2. Number of events by month. Events are determined by grouping reports in the database by Permittee, Event Type, and Incident Date.

	Jan '22	Feb '22	Mar '22	Apr '22	May '22	Jun '22	Jul '22	Aug '22	Sep '22	Oct '22	Nov '22	Dec '22	*Totals*
CSO – Treated							9	7	14	11	12	10	***63***
CSO – Untreated							35	38	50	57	41	38	***259***
Partially Treated – Blended							5	4	16	10	10	12	***57***
Partially Treated – Other								1	1				***2***
SSO – Through WW Outfall													
SSO – Pump Station / Force Main Failure												2	***2***
SSO – Surcharging Under High Flow												1	***1***
Totals							***49***	***50***	***81***	***78***	***63***	***63***	***384***

Table A3. Volume by month in millions of gallons. Volumes have been rounded for ease of display.

	Jan '22	Feb '22	Mar '22	Apr '22	May '22	Jun '22	Jul '22	Aug '22	Sep '22	Oct '22	Nov '22	Dec '22	*Totals*
CSO – Treated							11	7	31	35	31	39	***153***
CSO – Untreated							115	87	229	128	102	145	***805***
Partially Treated – Blended							15	18	138	63	34	212	***480***
Partially Treated – Other								4	0.4				***4***
SSO – Through WW Outfall													
SSO – Pump Station / Force Main Failure												0.03	***0.03***
SSO – Surcharging Under High Flow												0.4	***0.4***
Totals							***141***	***115***	***399***	***226***	***167***	***395***	***1443***

Table A4. Number of reports by CSO permit holder.

	BWSC	Cambridge	Chelsea	Chicopee	Fall River	Fitchburg	Gloucester	GLSD	Haverhill	Holyoke	Lowell	Lynn	MWRA	Montague	New Bedford	Somerville	Springfield	Taunton	Worcester	*Totals*
CSO – Treated				9	38				3	13			14			2			8	***87***
CSO – Untreated	15	10	5	109	159	60	1	4	41	198	63	22	1	26	228	1	209			***1152***
Partially Treated – Blended				4	26	2		2	1		16		6	1			2			***60***
Partially Treated – Other				1							1									***2***
SSO – Through WW Outfall																				
SSO – Pump Station / Force Main Failure							1													***1***
SSO – Surcharging Under High Flow												1								***1***
Totals	***15***	***10***	***5***	***123***	***223***	***62***	***2***	***6***	***45***	***211***	***80***	***23***	***21***	***27***	***228***	***3***	***211***		***8***	***1303***

Table A5. Number of events by CSO permit holder. Events are determined by grouping reports in the database by Permittee, Event Type, and Incident Date.

	BWSC	Cambridge	Chelsea	Chicopee	Fall River	Fitchburg	Gloucester	GLSD	Haverhill	Holyoke	Lowell	Lynn	MWRA	Montague	New Bedford	Somerville	Springfield	Taunton	Worcester	*Totals*
CSO – Treated				9	21				1	12			10			2			8	***63***
CSO – Untreated	9	8	3	16	28	19	1	2	16	37	13	11	1	12	48	1	34			***259***
Partially Treated – Blended				4	25	2		2	1		16		4	1			2			***57***
Partially Treated – Other				1							1									***2***
SSO – Through WW Outfall																				
SSO – Pump Station / Force Main Failure							1													***1***
SSO – Surcharging Under High Flow												1								***1***
Totals	***9***	***8***	***3***	***30***	***74***	***21***	***2***	***4***	***18***	***49***	***30***	***12***	***15***	***13***	***48***	***3***	***36***		***8***	***383***

Table A6. Volume by CSO permit holder in millions of gallons. Volumes have been rounded for ease of display.

	BWSC	Cambridge	Chelsea	Chicopee	Fall River	Fitchburg	Gloucester	GLSD	Haverhill	Holyoke	Lowell	Lynn	MWRA	Montague	New Bedford	Somerville	Springfield	Taunton	Worcester	*Totals*
CSO – Treated				6	31				0.05	39			54			3			21	***153***
CSO – Untreated	1	0.5	0.3	51	61	3	0.02	16	2	85	128	13	0.01	0.2	230	0.03	212			***805***
Partially Treated – Blended				3	192	14		3	2		190		70	0.03			6			***480***
Partially Treated – Other				4							0.4									***4***
SSO – Through WW Outfall																				
SSO – Pump Station / Force Main Failure							0.03													***0.03***
SSO – Surcharging Under High Flow												0.4								***0.4***
Totals	***1***	***0.5***	***0.3***	***64***	***284***	***18***	***0.05***	***19***	***4***	***124***	***318***	***13***	***124***	***0.3***	***230***	***3***	***218***		***21***	***1443***

Table A7. Events and volume by waterbody. Volumes have been rounded for ease of display.

		Acushnet R.	Alewife Brook (Cambridge)	Beaver Brook (Lowell)	Birch Brook (Fitchburg)	Boston Inner Harbor	Charles R.	Chelsea R.	Chicopee R.	Clark Cove	Concord R.	Connecticut R.	Fort Point Channel	Gloucester Inner Harbor	Little Mystic Channel	Little R. (Haverhill)	Lynn Harbor	Massachusetts Bay	Merrimack R.	Mill Brook To Blackstone R.	Mill R. (Springfield)	Mount Hope Bay	Mystic R.	Nashua R.	New Bedford Inner Harbor	New Bedford Outer Harbor	North Nashua R.	Quequechan R.	Saugus R.	Spicket R.	Taunton R.	
Number of days with events		***33***	***8***	***8***	***2***	***4***	***5***	***3***	***16***	***33***	***8***	***47***	***4***	***1***	***2***	***16***	***7***	***4***	***21***	***8***	***15***	***27***	***10***	***18***	***26***	***24***	***16***	***3***	***11***	***1***	***28***	
Volume (million gal.)	**CSO – Treated**						38					45				0.04			0.01	21		1	18								30	***153***
	CSO – Untreated	111	0.5	6	0.01	0.3	0.1	0.3	10	42	22	323	1	0.02	0.1	2	10		116		16	12		2	21	57	1	0.5	3	0.5	49	***805***
	Partially Treated – Blended											9						70	194			192					14					***480***
	Partially Treated – Other											4							0.4													***4***
	Total Volume (in million gallons)	***111***	***0.5***	***6***	***0.01***	***0.3***	***39***	***0.3***	***10***	***42***	***22***	***381***	***1***	***0.02***	***0.1***	***2***	***10***	***70***	***311***	***21***	***16***	***205***	***18***	***2***	***21***	***57***	***15***	***0.5***	***3***	***0.5***	***79***	***1442***

Table A8. Events and volume by the municipality in which the discharge occurred. Volumes have been rounded for ease of display.

		Agawam	Boston	Cambridge	Chelsea	Chicopee	Fall River	Fitchburg	Gloucester	Haverhill	Holyoke	Lawrence	Lowell	Lynn	Montague	New Bedford	North Andover	Shrewsbury	Somerville	Springfield	Winthrop	Worcester	***Totals***
Number of days with events		***2***	***10***	***8***	***3***	***16***	***30***	***20***	***2***	***16***	***38***	***2***	***20***	***12***	***13***	***48***	***2***	***1***	***10***	***34***	***4***	***8***	
Volume (million gal.)	**CSO – Treated**		38			6	31			0.05	39								18			21	***153***
	CSO – Untreated		1	1	0.3	51	61	3	0.02	2	85	16	128	13	0.2	230				212			***805***
	Partially Treated – Blended	6				3	192	14		2			190		0.03		3				70		***480***
	Partially Treated – Other					4							0.4										***4***
	SSO – Through WW Outfall																						
	SSO – Pump Station / Force Main Failure								0.03									0.002					***0.03***
	SSO – Surcharging Under High Flow													0.4									***0.4***
	Volume (in million gallons)	***6***	***40***	***1***	***0.3***	***64***	***284***	***18***	***0.05***	***4***	***124***	***16***	***318***	***13***	***0.3***	***230***	***3***	***0.002***	***18***	***212***	***70***	***21***	***1443***