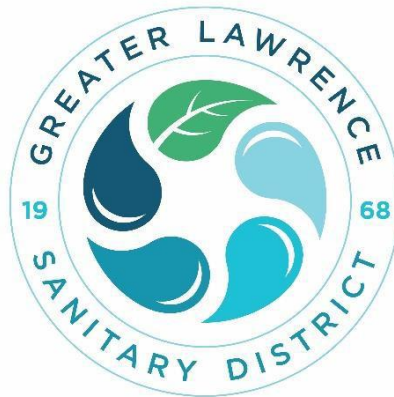


GREATER LAWRENCE SANITARY DISTRICT

COMBINED SEWER OVERFLOW (CSO) FINAL PUBLIC NOTIFICATION PLAN



LEADERS IN WASTEWATER
MANAGEMENT

Submitted January 11, 2023
Revised March 30, 2023

COMBINED SEWER OVERFLOW (CSO) FINAL PUBLIC NOTIFICATION PLAN



The Greater Lawrence Sanitary District (GLSD) was established by Chapter 750 of the Massachusetts Acts of 1968 for the purpose of building, maintaining, and operating a system of sewage collection and disposal for the cities of Lawrence and Methuen, and the towns of Andover, North Andover, and Salem New Hampshire. The District's facilities have been operational since April 1977. GLSD is currently designed for an average flow of 52 million gallons per day (mgd) with a peak flow capability of 165 mgd during high flow events due to rain and/or snowmelt. The average daily flow is currently measuring 30 mgd.

As required by NPDES Permit MA 0100447, Part I.F.3.g Public Notification Plan, and per 314 CMR 16.00, GLSD is providing the following information which details how requirements will be met for public notification.

1. FACILITY INFORMATION

Name of Permittee: Greater Lawrence Sanitary District

Permittee Contact Name: Brett Leavitt

Email address: bleavitt@glsd.org

Permittee Mailing Address: 240 Charles Street, North Andover, MA 01845

NPDES Permit #: MA 0100447

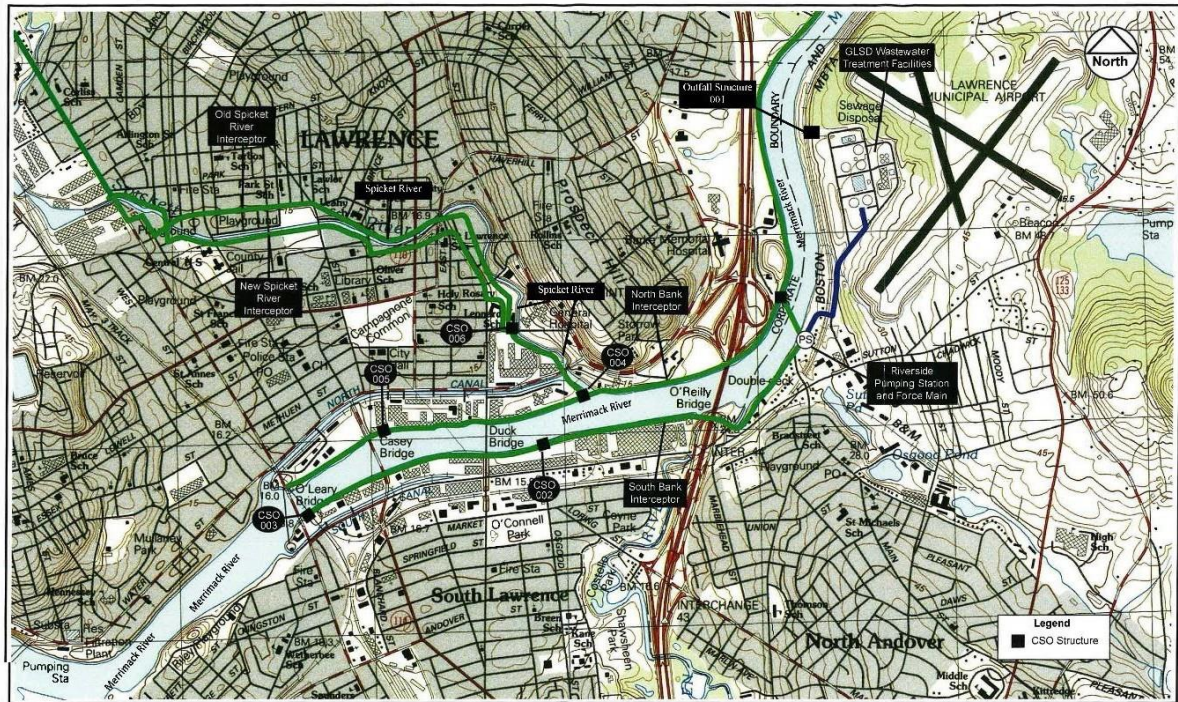
Phone Number: 978-685-1612

System Contains: Collection System, (1) Pump Station, and Wastewater Treatment Plant

Location of WWTP discharge: Merrimack River

Please see map and table below for locations of CSO discharges and affected waterbodies.

GREATER LAWRENCE SANITARY DISTRICT – CSO Structures and Map

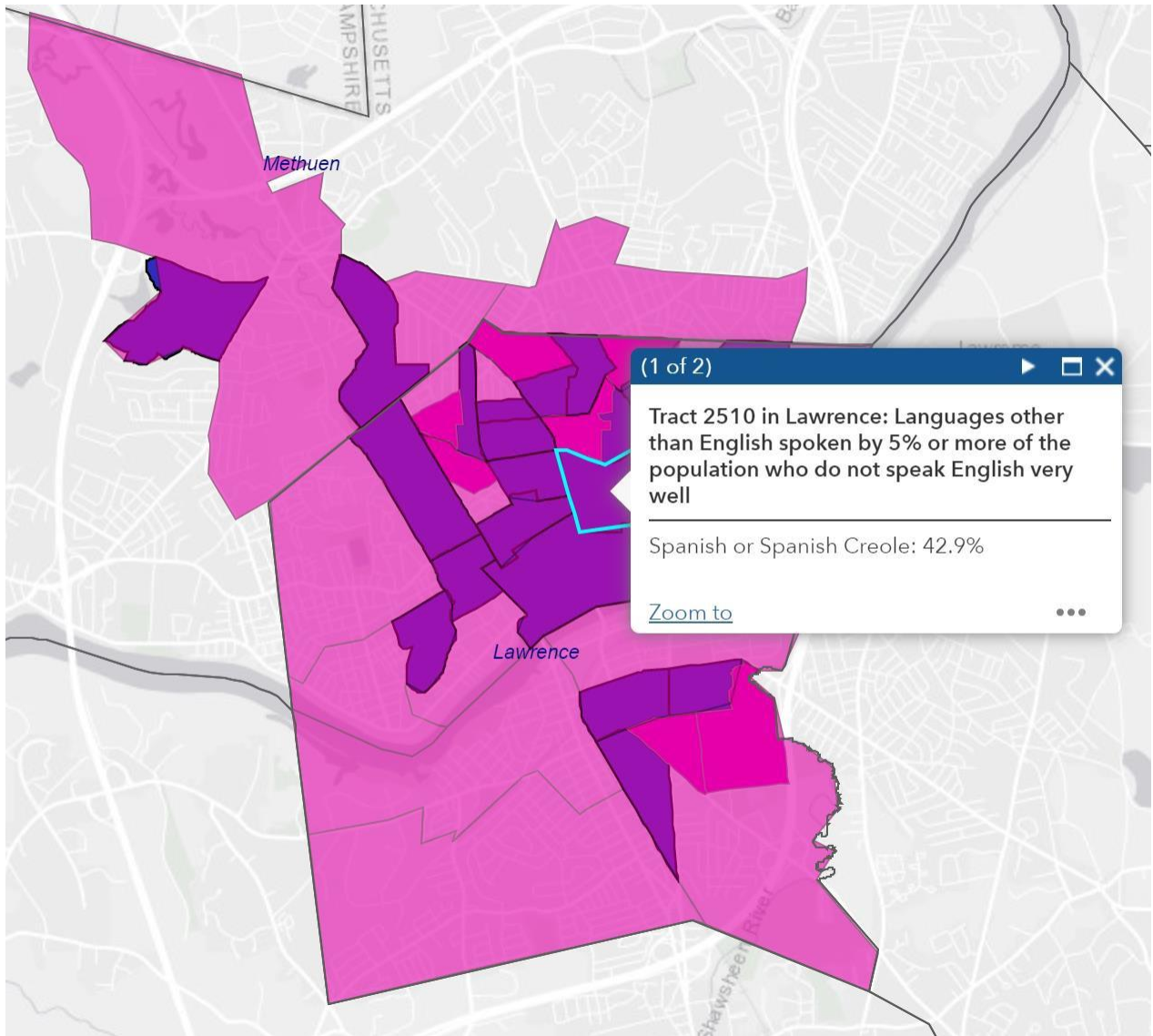


Source: USGS Lawrence Quadrangle Scanned Tiles
 Greater Lawrence Sanitary District Final ITC/PEIR
 Figure ES-1
 Greater Lawrence Sanitary District Major Interceptors and Facilities

Outfall #	Latitude	Longitude	Receiving Water
001 – WWTP Effluent	42° 43' 5"	71° 7' 58"	Merrimack River
002 - CSO	42° 42' 11"	71° 08' 59"	Merrimack River
003 - CSO	42° 42' 02"	71° 09' 19"	Merrimack River
004 - CSO	42° 42' 21"	71° 08' 31"	Merrimack River
005 - CSO	42° 42' 15"	71° 09' 03"	Merrimack River
006 - CSO	42° 42' 33"	71° 08' 42"	Spicket River

2. IDENTIFICATION OF ENVIRONMENTAL JUSTICE POPULATIONS

GLSD identified Environmental Justice (EJ) populations in Methuen and Lawrence that have 25% or more households that lack English Language Proficiency and at least 5% have speakers that identify as do not speak English very well. Please see information for the city of Lawrence below.



Public Advisory Notification Translation: GLSD uses both internal (employees) and external sources, our communications specialist, Mayo Designs, to translate into Spanish, if needed.

The District provides all notifications in both English and Spanish based on the Environmental Justice (EJ) designation of the affected areas. Both English and Spanish notifications are sent simultaneously. CSO, SSO, and High Flow Treatment (HFT) Notifications are being submitted for approval as part of this Final Notification Plan in **Appendix A**. Initial, supplemental, and cessation emails are provided within this appendix.

The list of required recipients is in **Appendix B**. Please note, anyone from the public already subscribed to GLSD's CSO alert emails are not included in this list.

Signage and Website Translation: In accordance with 314 CMR 16.05 (2) and GLSD's NPDES Permit, each CSO outfall has signs at each location that are easily readable by the public from the land and water. These signs are 12 x 18 inches in size, with white lettering against a green background and contain the following information as outlined below in English and Spanish: GREATER LAWRENCE SANITARY DISTRICT, WET WEATHER, SEWAGE DISCHARGE, OUTFALL 005, for example.



GLSD is requesting to replace the signs noted above with signs that align with GLSD's new logo and color scheme. The updated sign will help the reader identify who is responsible for the outfall more easily.



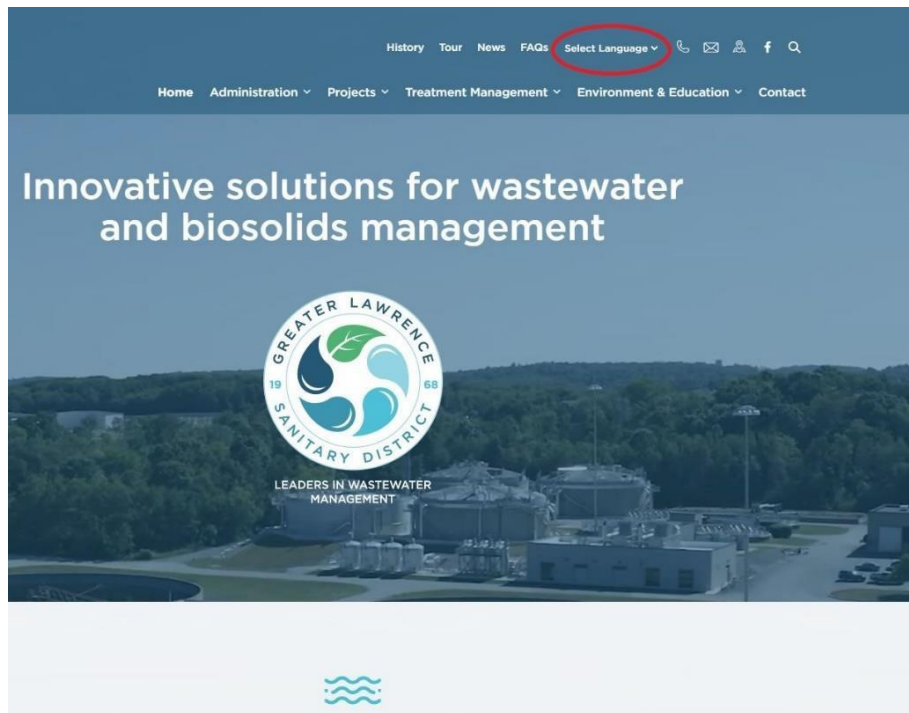
LEADERS IN WASTEWATER
MANAGEMENT

GREATER LAWRENCE SANITARY DISTRICT

Wet Weather

Sewage Discharge *Outfall #004*

GLSD’s website includes functionality to translate easily into Spanish as shown below.



Updates to the website, including posting notifications, will be done by GLSD employees as soon as possible, but no later than the next business day.

Signage at downstream locations will be posted in English and will include universal symbols, QR code, and the email address to GLSD’s website. GLSD has worked with local Boards of Health and/or Health Agents to determine locations for these signs. Please refer to **Appendix C** for potential layouts of this sign at public access points. GLSD’s has reached out to Health Officials and/or Boards of Health in Lawrence, Methuen, Haverhill, and Groveland. In addition, GLSD is coordinating with other WWTPs to determine if one sign may be placed with information from each facility.

An initial email was sent to Boards of Health and/or Health Agents on April 7, 2022 and again on January 8, 2023 to Lawrence, Methuen, Haverhill, and Groveland Health Officials from GLSD’s affected area. Both emails can be found in **Appendix D**. As of the date of this report, West Newbury and Haverhill provided locations for signs. The locations for Haverhill are outlined in **Appendix E** since these locations are within GLSD’s affected area:

1. Public launch next to Washington’s Landing Park at the foot of Ferry Street
2. The public docks behind the Tap
3. Next to the Water Street Fire Station
4. Abbots Marina Service, Boat Launch
5. River Rest Park, Boat Launch
6. Riverside Park, Canoe Launch, Fishing, Picnicking, Sport Facilities

7. Rivers Edge Park, Picnicking, Fishing, Sport facilities
8. Lighthouse Landing Marina, Boat Launch
9. Kazmiera Marina, Boat Launch
10. Crescent Yacht Club, Boat Launch
11. City Landing at Rock's Village, Canoe Launch, Fishing

GLSD is coordinating the logistics of installing signs at the above locations with the City of Haverhill by September 1, 2023.

GLSD requested Kleinfelder Engineers to calculate the affected areas of combined sewer overflows, sewer system overflows, and high flow treatment activity. Affected areas due to SSO's will be based on site specific information at the time of the event. Blending only events do not have an affected area since GLSD has historical data to support that the final effluent follows its NPDES Permit. Regardless, GLSD will send emails for blending events to the same distribution list as a CSO event.

Affected areas for CSO's was determined by an analysis of river flow during wet weather, CSO discharge and pathogen concentrations. Historical USGS gauge station flow data and rainfall data will be used to determine the typical river flow conditions during CSO activation. The affected area was determined to reach the town of Groveland. Therefore, the affected communities are Lawrence, Methuen (both below the Great Stone Dam) and Haverhill and Groveland. Please find memorandum in Appendix F for more detailed information.

3. DISCHARGES, OVERFLOWS, AND PUBLIC NOTIFICATION CONTENT

GLSD is aware that all events covered under 314 CMR 16.03 (1) (a-e) require a public notification and the information that is required as outlined in 314 CMR 16.04 (10).

The Greater Lawrence Sanitary District has developed and utilizes a Public Notification Plan for the District's five (5) combined sewer overflow outfall locations (CSO's) located along the Merrimack and Spicket Rivers in Lawrence, Massachusetts. This plan has been developed in accordance with NPDES Permit #MA0100447, 314 CMR 16.00 and to fulfill its requirement to meet Part I. F 2 a 8, Public Notification to ensure that the public receives adequate notification of CSO occurrences and impacts.

The District has contracted with a Critical Event Management Specialist, Everbridge, located in Boston, MA to provide their platform. The system currently provides support for notifications for essential downstream users that include but are not limited to public health departments, water departments and self-subscribers in addition to others.

A self-subscriber-based notification portal is accessible from a link located on the District's website, www.glsd.org for the public to subscribe to CSO, SSO and High Flow Treatment Activation notifications. The notification emails also contain information on self-subscribing as well.

The District provides all notifications in both English and Spanish based on the Environmental Justice (EJ) designation of the affected areas. Both English and Spanish notifications are sent in the same email.

Two GLSD employees are permitted to conduct reporting on the MassDEP online data system, Cheri Cousens, P.E., Executive Director, and Brett Leavitt, Operations Manager.

The District has calculated the mean flow over the last three full calendar years for each CSO outfall as outlined below. This information will be provided in each initial CSO Notification.

	Station 2	Station 4	Station 3	Station 5	Station 6
3 Year Mean Flow	49+40	44+85	93+15	79+30	17+60
2020-2022	Volume MG	Volume MG	Volume MG	Volume MG	Volume MG
Million Gallons	1.84	6.85	0.0868	0.17	0.70

Required Content of Public Notification 314 CMR 16.04 (10): An Initial Notification (**Example 1,3,5 attached in Appendix A**) of a probable activation is provided to all essential and subscribed individuals using the Everbridge Event Management System within two (2) hours of the discovery of an event. The initial notification is delivered via email if instrumentation indicates a probable or known CSO/SSO/High Flow Treatment (HFT) event has occurred, or it is determined by another vehicle. The on-shift supervisor performs this task within 2 hours of becoming aware of activation but will strive to disseminate this information sooner, if possible, per 314 CMR 16.04 (10).

The Initial Notification will include:

- Date and time of probable CSO/SSO/ HFT Initiation.
- CSO number or SSO location.
- Whether the discharge is ongoing or has ceased at the time of notification.
- Mean CSO discharge volumes based on last three full calendar years.
- Identity the NPDES Permit number of the District
- Water and land area affected by the CSO discharge
- Precautionary measures to be taken by the public

4. DISCOVERY AND REQUIRED TIMELINE FOR NOTIFICATION

DISCOVERY OF DISCHARGE OR OVERFLOW 314 CMR 16.04 (5) (A)(B)(C):

The Discovery and Metering of CSO volume are determined by the District using the Interceptor level and CSO velocity instrumentation. CSO Structures (002) 49+40 Southside interceptor and CSO Structure (004) 44+85 Northside interceptor contains said instrumentation. When the interceptor liquid level reaches a predetermined level (21ft.) and the velocity meter senses outward flow movement it will indicate that the District is experiencing a CSO event and the Initial CSO notification will be sent to all individuals and organizations in the system within two hours of this indication. Notifications will be posted on the District’s website by the end of the next business day when staff are available to make edits and additions.

The method to discover and determine total flow from each outfall is outlined below:

CSO Discovery:

- Throughout a rainfall or snowmelt event, Operations Personnel shall watch the liquid levels in both the north and south interceptors.
- When the liquids levels reach the following elevations, a CSO event is probable.
 - South Interceptor – greater or equal to 21.0 feet
 - North Interceptor – greater or equal to 21.0 feet

Flow measurement for reporting purposes:

Two Main Overflow Structures – 49 + 40 Outfall No. 002 and 44 + 85 Outfall No. 004 have the following instrumentation available in addition to interceptor level:

- ISCO Flow meter, model 4210, utilizing Flow Link software
- The use of Flow Link software allows for direct measurement of all volumes discharged through each structure.
- Hach Model FL1500 with velocity sensor detects outgoing flow.
- The liquid levels in the interceptors are monitored utilizing ultrasonic telemetry.

Three Relief Structures – 93 + 15 Outfall No. 003, 79 + 30 Outfall No. 005, and 17 + 60 Outfall No. 006

- The level needed to activate each Relief Structure is:
 - 93 + 15 Outfall No. 003 – South Interceptor – 24.1 feet
 - 79 + 30 Outfall No. 005 – North Interceptor – 24.3 feet
 - 17 + 60 Outfall No. 006 – North Interceptor – 23.5 Feet
- Each structure has a known gate opening width:
 - 93 + 15 Outfall No. 003 – one flapper gate 8’ by 4’
 - 79 + 30 Outfall No. 005 – one flapper gate 8’ by 4’
 - 17 + 60 Outfall No. 006 – one flapper gate 8’ by 4’
- With a known depth and gate width, the flow discharged at outfalls 003, 005, and 006 can be calculated utilizing the following equation for a suppressed rectangular sharp crested weir:

$$Q = 3.33 B H^{(3/2)}$$

Where:

- Q = Flow Rate in cubic feet per second (cfs)
- B = width of channel in feet (ft)
- H = measurement of head over the invert in feet (ft)

Finally, the time of overflow at the structure is multiplied by the flow rate to determine the total volume of CSO discharge.

Discovery and Notification of SSO Discharge: Sanitary Sewer Overflows (SSOs) seldomly occur from GLSD's collection system. Discovery may be made by our staff while on routine inspections. When discovery is made, the on-shift supervisor will initiate an SSO notification with the information specified by 314 CMR 16.03(1)(c) through (e). The public advisory notification shall be issued within four hours of discovery. Notifications will be posted on the District's website by the end of the next business day when staff are available to make edits and additions.

Initiation of High Flow Treatment System (blended): During extreme wet weather events the District will initiate its high flow treatment system based on daily lab data inputted into a State Point Chart program that was designed to calculate the maximum flow that can be treated effectively through the secondary treatment system. When it is determined by the on-shift supervisor, based on the results of the State Point Chart, that secondary treatment capabilities will be exceeded, High Flow Treatment (HFT) may be initiated. The on-duty shift supervisor will then send a HFT "blended" notification within the required 2 hour requirement. Notifications will be posted on the District's website by the end of the next business day when staff are available to make edits and additions.

Continuation of Public Notification 314 CMR 16.04 (7): Supplemental Notifications of the end of CSO/SSO/HFT activation will be provided as soon as practicable, but no later than 8 hours after the initial notification of the CSO/SSO/HFT event. Once the CSO monitoring equipment provides confirmation of the termination of the discharge or status of an ongoing one at the eighth hour, a Supplemental Notification will be disseminated. Notifications will be posted on the District's website by the end of the next business day when staff are available to make edits and additions.

The District will also submit any corrections or updates to data submitted for the previous calendar year via the Departments electronic system by February 1st of each year.

Retractions may be difficult to determine within 48 hours if an event has occurred after hours, on a weekend or holiday. In these circumstances, retractions can be produced after an event's data is reviewed and by the end of the business day following the event. Most events occurring during normal business hours can be reviewed in a shorter timeframe as required by these regulations. It is GLSD's intention to provide retractions withing forty-eight (48) hours.

5. CSO PERMITTEE WEBSITE

GLSD includes the following information on its website (www.glsd.org);

- a) A map showing the locations of the permittee's outfalls including the corresponding outfall numbers in a NPDES or surface water discharge permit

- b) A summary of the permittee's Long-term CSO Control Plan, and status of its implementation
- c) Instructions on how an interested person can subscribe to receive public advisory notifications
- d) Links to any CSO Reports required to be developed in a NPDES or surface water discharge permit, or as part of any enforcement order, for at least the preceding three calendar years, if applicable; and
- e) A compilation of discharge data for each public advisory notification event, updated so that data for each month is posted within 15 days of the last day of the month. Data posted shall include updated information on the estimated duration, frequency and volume of the discharge, rainfall data, and treatment provided for any CSO discharges. The website shall include data for at least the preceding three calendar years, if applicable.

In addition, GLSD has established and maintains a public website to post public advisory notifications when issued. Also, the following has been added to the website as outlined in 314 CMR 16.04(10); information on its website about any treatment to disinfect pathogens and remove solids and other pollutants from the discharge or overflow, and links to websites providing information on the closure or advisory status of shellfish growing areas, bathing beaches, or other water resource areas potentially affected by the discharge or overflow.

A link to CSO information is on the main page of the GLSD's website that allows any interested party to subscribe to email notifications. The link brings you to EverBridge's site so the user can subscribe to email alerts from GLSD.



Welcome to our CSO Alerts Service!

9 Help & Answers Sign In Sign Up

Our priority is to keep all residents and employees safe, and to keep you informed!

Combined Sewer Systems were designed to collect rainwater runoff, domestic sewage, and industrial wastewater in one pipe that, under normal or "dry" conditions, transports the water to a treatment facility. The volume of wastewater can sometimes exceed the system's capacity, which occurs under "wet" conditions including heavy rainfall and snow melt.

Click on the "Sign Up" link at the bottom of the page to receive an alert when there is a CSO event.

You can also update your profile at any time.

Thank You. Please remember. We can't alert you, if we can't reach you!

Sign in to your account

Username

Password

[Sign In](#)

[Forgot Username or Forgot Password](#)

[Don't have an account? Sign Up](#)

Powered by [Everbridge](#) [Terms of Use](#) [Privacy Policy](#)

Please be advised that our Privacy Policy has changed effective May 22, 2019.

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6. SIGNAGE

GLSD will continue to maintain a warning sign at each of its CSO outfalls in accordance with requirements of its NPDES Permit and surface water discharge permits.

GLSD will install and maintain signage at public access points to waters affected by a potential discharge from a permittee's outfall. The locations for the signage have been provided to date by the town of West Newbury and Haverhill. The three locations identified by Haverhill are within GLSD's affected area. Each sign will identify:

- a) The existence of outfalls;
- b) The permittee;
- c) Information about weather events that may cause a discharge;
- d) A warning of the potential threat to public health by recreating in, or using waters and shores affected by a discharge; and
- e) Information for the public to subscribe to notifications about discharges in the local area waters.

GLSD has several options for these signs but will refer to MassDEP's template for guidance as well (see Appendix C). The signs in Haverhill will be in English and include universal symbols and QR codes to direct the reader to additional information.

7. PUBLIC NOTIFICATION RECIPIENTS

Two largest News Organizations and an Additional One that Serves the Environmental Justice Population:

Lawrence Eagle-Tribune, Will Broaddus, wbroadus@eagletribune.com

Boston Herald, Meghan Ottolini, meghan.ottolini@bostonherald.com

Rumbo News, The Bi-lingual Newspaper of the Merrimack Valley, Dalia Diaz, daliadiaz@rumbonews.com

Rumbo News serves the City of Lawrence and is a bi-lingual publication in English and Spanish.

8. List of discharge events for which public notifications were provided between July 6, 2022 and December 31, 2022.

Greater Lawrence Sanitary District Combined Sewer Overflow Summary July 6, 2022 -- December 31, 2022					
DATE	INCHES RAIN	SITE	DURATION (Hrs.)	VOLUME (MG)	CSO Cause
July 19, 2022		49+40	0.00	0.00	No Discharge
Precipitation Inches		44+85	0.43	0.51	Heavy Rain/High Flows
18th	0.23	93+15	0.00	0.00	No Discharge
19th	0.55	79+30	0.00	0.00	No Discharge
Storm Total	0.78	17+60	0.00	0.00	No Discharge
October 17-18, 2022	1.04	49+40	1.15	2.37	Heavy Rain/High Flows
		44+85	2.22	12.80	Heavy Rain/High Flows
		93+15	0.00	0.00	No Discharge
		79+30	0.92	0.05	Heavy Rain/High Flows
		17+60	1.17	0.48	Heavy Rain/High Flows
Totals	2.60		5.89	16.21	

Greater Lawrence Sanitary District High Flow Treatment Summary July 6, 2022 -- December 31, 2022					
DATE	INCHES RAIN	SITE	DURATION (Hrs.)	VOLUME (MG)	CSO Cause
September 23, 2022	0.42	High Flow Treatment	1.12	0.49	Heavy Rain/High Flows
December 23, 2022	1.92	High Flow Treatment	2.93	2.08	Heavy Rain/High Flows
Totals	2.34		4.05	2.57	

**Please refer to Appendix G for the MassDEP Combined Sewer Overflow Final
Public Notification Plan**

APPENDIX A

Initial Notification: CSO Example 1

GREATER LAWRENCE SANITARY DISTRICT Initial CSO Notification NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that a probable discharge of Combined Sewer Overflow (CSO) **began** at approximately MM-DD-YYYY at HH:MM:SS from the Greater Lawrence Sanitary District's CSO Structure(s).

At the time of this notification, the CSO event was still active. Additional information regarding this event will be emailed within 8 hours. Additionally, within five (5) business days information will be posted on the GLSD website and will include the total flow and duration of the CSO event as well as rainfall information.

CSO discharges are a mixture of stormwater and diluted sewage that flows through netting material for large debris removal and discharges directly into nearby receiving waters when the capacity of the treatment and transport systems are exceeded as a result of heavy rain and/or snowmelt. These overflows occur only when necessary to protect public health and safety.

Public health officials recommend avoiding contact with water bodies during rainstorms and for 48 hours afterwards, as there may be increased health risks due to bacteria or other pollutants associated with urban stormwater runoff and CSO discharges.

Additional information regarding CSOs and GLSD's Abatement Program is available on the District's website at www.GLSD.org. The link to subscribe to future CSO Notifications is available on this website as well.

	Station 2	Station 4	Station 3	Station 5	Station 6
3 Year Mean Flow	49+40	44+85	93+15	79+30	17+60
2020-2022	Volume MG	Volume MG	Volume MG	Volume MG	Volume MG
Million Gallons	1.84	6.85	0.0868	0.17	0.70

End Notification: CSO Example 2

GREATER LAWRENCE SANITARY DISTRICT
Supplemental CSO Notification end of Discharge
NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that a probable discharge of Combined Sewer Overflow (CSO) **ended** at approximately MM-DD-YYYY at HH:MM:SS from the Greater Lawrence Sanitary District's CSO Structure(s).

At the time of this notification, the CSO event was inactive. Additional information regarding this event will be posted within five (5) business days on the GLSD website and will include the total flow and duration of the CSO event as well as rainfall information.

CSO discharges are a mixture of stormwater and diluted sewage that flows through netting material for large debris removal and discharges directly into nearby receiving waters when the capacity of the treatment and transport systems are exceeded as a result of heavy rain and/or snowmelt. These overflows occur only when necessary to protect public health and safety.

Public health officials recommend avoiding contact with water bodies during rainstorms and for 48 hours afterwards, as there may be increased health risks due to bacteria or other pollutants associated with urban stormwater runoff and CSO discharges.

Additional information regarding CSOs and GLSD's Abatement Program is available on the District's website at www.GLSD.org. The link to subscribe to future CSO Notifications is available on this website as well.

DISTRITO SANITARIO DEL GRAN LAWRENCE

Notificación inicial de CSO

Permiso NPDES No.MA0100447

Fecha del Evento:
MM-DD-YYYY

Estimados interesados:

Esta es una notificación pública de que una descarga probable de desbordamiento de alcantarillado combinado (CSO) comenzó aproximadamente el DD-MM-AAAA a las HH:MM:SS de la(s) estructura(s) CSO del Greater Lawrence Sanitary District.

En el momento de esta notificación, el evento CSO todavía estaba activo. La información adicional sobre este evento se enviará por correo electrónico dentro de las 24 horas. Además, dentro de los cinco (5) días hábiles, la información se publicará en el sitio web de GLSD e incluirá el flujo total y la duración del evento CSO, así como información sobre las precipitaciones.

Las descargas de CSO son una mezcla de aguas pluviales y aguas residuales diluidas que fluyen a través del material de la red para la remoción de grandes escombros y se descargan directamente en las aguas receptoras cercanas cuando se excede la capacidad de los sistemas de tratamiento y transporte como resultado de fuertes lluvias y/o deshielo. Estos desbordamientos ocurren solo cuando es necesario para proteger la salud y la seguridad públicas.

Los funcionarios de salud pública recomiendan evitar el contacto con los cuerpos de agua durante las tormentas y durante las 48 horas posteriores, ya que puede haber mayores riesgos para la salud debido a las bacterias u otros contaminantes asociados con la escorrentía de aguas pluviales urbanas y las descargas de CSO.

Información adicional sobre las CSO y el Programa de reducción de GLSD está disponible en el sitio web del Distrito en www.GLSD.org. El enlace para suscribirse a futuras notificaciones de OSC también está disponible en este sitio web.

	Station 2	Station 4	Station 3	Station 5	Station 6
3 Year Mean Flow	49+40	44+85	93+15	79+30	17+60
2020-2022	Volume MG	Volume MG	Volume MG	Volume MG	Volume MG
Million Gallons	1.84	6.85	0.0868	0.17	0.70

End Notification: CSO Example 2 (Spanish)

DISTRITO SANITARIO DEL GRAN LAWRENCE
Notificación suplementaria de CSO al final de la descarga
Permiso NPDES No.MA0100447

Fecha del Evento:
MM-DD-AAAA

Estimados interesados:

Esta es una notificación pública de que una descarga probable de desbordamiento de alcantarillado combinado (CSO) finalizó aproximadamente el MM-DD-AAAA a las HH:MM:SS de la(s) estructura(s) CSO del Greater Lawrence Sanitary District.

En el momento de esta notificación, el evento CSO estaba inactivo. Se publicará información adicional sobre este evento dentro de los cinco (5) días hábiles en el sitio web de GLSD e incluirá el flujo total y la duración del evento CSO, así como información sobre las precipitaciones.

Las descargas de CSO son una mezcla de aguas pluviales y aguas residuales diluidas que fluyen a través del material de la red para la remoción de grandes escombros y se descargan directamente en las aguas receptoras cercanas cuando se excede la capacidad de los sistemas de tratamiento y transporte como resultado de fuertes lluvias y/o deshielo. Estos desbordamientos ocurren solo cuando es necesario para proteger la salud y la seguridad públicas.

Los funcionarios de salud pública recomiendan evitar el contacto con los cuerpos de agua durante las tormentas y durante las 48 horas posteriores, ya que puede haber mayores riesgos para la salud debido a las bacterias u otros contaminantes asociados con la escorrentía de aguas pluviales urbanas y las descargas de CSO.

Información adicional sobre las CSO y el Programa de reducción de GLSD está disponible en el sitio web del Distrito en www.GLSD.org. El enlace para suscribirse a futuras notificaciones de OSC también está disponible en este sitio web.

GREATER LAWRENCE SANITARY DISTRICT

Initiation of High Flow Treatment Notification

NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that Due to heavy precipitation the District initiated the High Flow Treatment System **began** at approximately MM-DD-YYYY at HH:MM:SS.

Blending is an operational strategy for managing high treatment plant flows that occur during major storm events due to infiltration and inflow (I & I) of rainwater into the combined sewer system. During extreme wet weather events, wastewater becomes a small portion of the total treatment plant flow. Blending protects the treatment plant's biological treatment process from flows that would damage the process and/or exceed its design capacity. During a blending event, all treatment plant flows undergo preliminary and primary treatment, which consists of screening, grit removal, and settling of heavy solids. Most of the flow then continues to the secondary treatment process, where dissolved organic material is removed by bacteria and other microorganisms. A portion of the flow is routed around (i.e. bypasses) secondary treatment, and then recombines with the main flow after receiving chlorination for disinfection and dechlorination to remove the chlorine before being discharged to the Merrimack River. When blending, the treatment plant is still required to meet all applicable regulatory limits in its discharge permit.

Blending is used at the Greater Lawrence Sanitary District when plant flows which are typically in the range of 25-28 million gallons per day exceed 130-135 million gallons per day. Blending usually lasts for between 2 and 8 hours but can persist for a day or more during extreme storm events.

Blending events regularly meet permit requirements but still may consist of untreated or partially treated sewage or waste. In the rare instance it does not, public health officials recommend avoiding contact with water bodies for 48 hours after the discharge due to increased health risks from bacteria and other pollutants.

Additional information regarding the High Flow Treatment System and GLSD's Abatement Program is available on the District's website at www.glsd.org. The link to subscribe to future notifications is available on this website as well.

GREATER LAWRENCE SANITARY DISTRICT
Cessation of High Flow Treatment Notification
NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that Due to heavy precipitation the District initiated the High Flow Treatment System **ended** at approximately MM-DD-YYYY at HH:MM:SS.

Blending is an operational strategy for managing high treatment plant flows that occur during major storm events due to infiltration and inflow (I & I) of rainwater into the combined sewer system. During extreme wet weather events, wastewater becomes a small portion of the total treatment plant flow. Blending protects the treatment plant's biological treatment process from flows that would damage the process and/or exceed its design capacity. During a blending event, all treatment plant flows undergo preliminary and primary treatment, which consists of screening, grit removal, and settling of heavy solids. Most of the flow then continues on to the secondary treatment process, where dissolved organic material is removed by bacteria and other microorganisms. A portion of the flow is routed around (i.e. bypasses) secondary treatment, and then recombines with the main flow after receiving chlorination for disinfection and dechlorination to remove the chlorine before being discharged to the Merrimack River. When blending, the treatment plant is still required to meet all applicable regulatory limits in its discharge permit.

Blending is used at the Greater Lawrence Sanitary District when plant flows which are typically in the range of 25-28 million gallons per day exceed 130-135 million gallons per day. Blending usually lasts for between 2 and 8 hours but can persist for a day or more during extreme storm events.

Blending events regularly meet permit requirements but still may consist of untreated or partially treated sewage or waste. In the rare instance it does not, public health officials recommend avoiding contact with water bodies for 48 hours after the discharge due to increased health risks from bacteria and other pollutants.

Additional information regarding the High Flow Treatment System and GLSD's Abatement Program is available on the District's website at www.glsd.org. The link to subscribe to future notifications is available on this website as well.

Initial Notification: SSO Example 5

GREATER LAWRENCE SANITARY DISTRICT
Initial Sanitary Sewer Overflow Notification
NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that due to an overflow of the sewer system that a probable discharge from a Sanitary Sewer Overflow (SSO) Occurred at the District it **began** at approximately MM-DD-YYYY at HH:MM:SS.

A Sanitary Sewer Overflow (SSO) is an unintentional discharge of wastewater from a sanitary sewer to the environment prior to reaching a treatment facility. SSOs occur on infrequent occasions and causes of sanitary sewer overflows include blockage of sewer lines, infiltration/Inflow of excessive stormwater into sewer lines during heavy rainfall or snowmelt, a malfunction of a pumping station, electrical power failure, or broken sewer line.

End Notification: SSO Example 6

GREATER LAWRENCE SANITARY DISTRICT
Cessation Sanitary Sewer Overflow Notification
NPDES Permit No.MA0100447

Date of the Event:
MM-DD-YYYY

Dear Interested Parties:

This is a public notification that due to an overflow of the sewer system that a probable discharge from a Sanitary Sewer Overflow (SSO) Occurred at the District that **ended** at approximately MM-DD-YYYY at HH:MM:SS.

A Sanitary Sewer Overflow (SSO) is an unintentional discharge of wastewater from a sanitary sewer to the environment prior to reaching a treatment facility. SSOs occur on infrequent occasions and causes of sanitary sewer overflows include blockage of sewer lines, infiltration/Inflow of excessive stormwater into sewer lines during heavy rainfall or snowmelt, a malfunction of a pumping station, electrical power failure, or broken sewer line.

APPENDIX B

List of Recipients per 314 CMR 16.04 (4)

Lawrence

Health marmano@cityoflawrence.com

Methuen

Health fzemel@ci.methuen.ma.us

Andover

Health health@andoverma.gov
tcarbone@andoverma.gov

North Andover

Health blagrasse@northandoverma.gov

Haverhill

Health rmacdonald@cityofhaverhill.com
Harbormaster vetsm@comcast.net

Newburyport

Health lvlasuk@cityofnewburyport.com
Harbormaster harbormaster@cityofnewburyport.com

Salisbury

Health jmorris@salisburyma.gov

Newbury

Health boardofhealth@townofnewbury.org

West Newbury

Health psevigny@wnewbury.org

Amesbury

Health ketchend@amesbury.gov
Water System Manager masonj@amesburyma.gov

Merrimac

Health

healthagent@townofmerrimac.com

Water

jclark@townofmerrimac.com**Groveland**

Health

health@grovelandma.comhealthagent@townofmerrimac.com

Harbormaster

vetsm@comcast.net**State and Federal**Shellfish.gloucester@mass.govMarine.fish@state.ma.usDoug.cameron@mass.govJeff.kennedy@mass.govMassdep.sewagenotification@mass.govR1.EPANotifications@epa.govDPHToxicology@mass.govMEMA.StateControl@mass.gov (DCR)Kevin.brander@state.ma.usJames.barsanti@state.ma.usKoopman.douglas@epa.govMelcher.john@epa.gov**Media**news@eagletribune.commeghan.ottolini@bostonherald.comrumbo@rumbonews.com

APPENDIX C

LAYOUTS FOR DOWNSTREAM SIGNAGE

PUBLIC ADVISORY



Heavy rains can cause pipe overflows and temporary pollution due to a mixture of stormwater and untreated sewage.

During and after rainstorms please avoid swimming, wading, boating and fishing since this waterway may contain bacteria that causes illness.



Combined Sewer System Structures that affect this location:

- » Lowell Duck Island
- » Greater Lawrence Sanitary District
- » Haverhill Wastewater Treatment Facility

Please visit glsd.org/csos to sign up for notifications or scan QR code for the most up to date information.



PUBLIC ADVISORY



NO SWIMMING



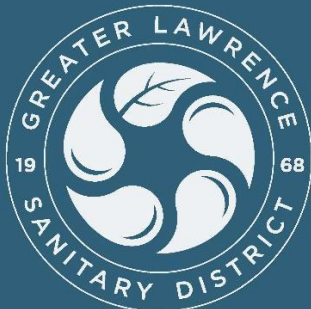
NO FISHING



NO BOATING

Heavy rains can cause pipe overflows and temporary pollution due to a mixture of stormwater and untreated sewage.

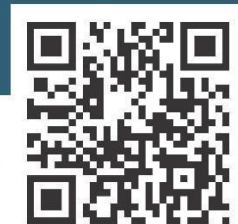
During and after rainstorms please avoid swimming, wading, boating and fishing since this waterway may contain bacteria that causes illness.



LEADERS IN WASTEWATER
MANAGEMENT

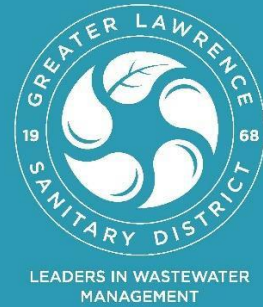
**Combined Sewer System Structures
that affect this location:**

- » *Lowell Duck Island*
- » *Greater Lawrence Sanitary District*
- » *Haverhill Wastewater Treatment Facility*



Please visit glsd.org/csos to sign up for notifications or scan **QR code** for the most up to date information.

PUBLIC ADVISORY



Heavy rains can cause pipe overflows and temporary pollution due to a mixture of stormwater and untreated sewage.

During and after rainstorms please avoid swimming, wading, boating and fishing since this waterway may contain bacteria that causes illness.



Combined Sewer System Structures that affect this location:

- » *Lowell Duck Island*
- » *Greater Lawrence Sanitary District*
- » *Haverhill Wastewater Treatment Facility*

Please visit glsd.org/csos to sign up for notifications or scan QR code for the most up to date information.



APPENDIX D

CORRESPONDENCE WITH BOARDS OF HEALTH AND HEALTH AGENTS

Cheri R. Cousens

From: Cheri R. Cousens
Sent: Thursday, April 7, 2022 11:52 AM
To: 'Michael Armano'; 'berkenbushk@amesbury.gov'; 'tcarbone@andoverma.gov'; 'mschenk@gloucester-ma.gov'; 'healthagent@townofmerrimac.com'; 'rmacdonald@cityofhaverhill.com'; 'colleenf@ipswich-ma.gov'; 'fzemel@ci.methuen.ma.us'; 'boardofhealth@townofnewbury.org'; 'fgiacalone@cityofnewburyport.com'; 'blagrasse@northandoverma.gov'; 'jmorris@salisburyma.gov'; 'psevigny@wnewbury.org'
Cc: Brett Leavitt - Greater Lawrence Sanitary District (BLEavitt@GLSD.org); Alex Katsoulakos
Subject: 314 CMR 16.00 Notification Requirements to Promote Public Awareness of Sewage Pollution

Dear Health Official,

I am reaching out to you regarding new requirements outlined in MassDEP's Regulations 314 CMR 16.00 Notification Requirements to Promote Public Awareness of Sewage Pollution. The document can be found on MassDEP's website at: <https://www.mass.gov/doc/314-cmr-1600-notification-requirements-to-promote-public-awareness-of-sewage-pollution-1/download>.

These regulations state that GLSD and other facilities that experience CSO's need to coordinate with representatives of Boards of Health and/or Health Agents on public signage. Specifically, Sections 16.05 CSO Permittee Website and Signage Requirements (3), and 16.09 Public Health Warnings will be of interest to you and our future discussions to accomplish these goals. Please see below for your ease of review.

16.05: CSO Permittee Website and Signage Requirements (1) A permittee with a combined sewer system shall include, at a minimum, the following information on its website: (a) A map showing the locations of the permittee's outfalls including the corresponding outfall numbers in a NPDES or surface water discharge permit, if applicable; (b) A summary of the permittee's Long-term CSO Control Plan, and status of its implementation, if applicable; (c) Instructions on how an interested person can subscribe to receive public advisory notifications; (d) Links to any CSO Reports required to be developed in a NPDES or surface water discharge permit, or as part of any enforcement order, for at least the preceding three calendar years, if applicable; and (e) A compilation of discharge data for each public advisory notification event, updated so that data for each month is posted within 15 days of the last day of the month. Data posted shall include updated information on the estimated duration, frequency and volume of the discharge, rainfall data, and treatment provided for any CSO discharges. The website shall include data for at least the preceding three calendar years, if applicable; (2) Each permittee shall install and maintain a warning sign at each of its CSO outfalls in accordance with requirements of its NPDES and surface water discharge permits. (3) Each permittee shall install and maintain signage at public access points to waters affected by a potential discharge from a permittee's outfall by the date established in their approved CSO Public Notification Plan. The locations for the signage shall be established in the permittee's approved CSO Public Notification Plan based on consultation with boards of health or health departments in the municipalities directly impacted by the discharge. Each sign shall identify: (a) The existence of the outfall; (b) The permittee; (c) Information about weather events that may cause a discharge; (d) A warning of the potential threat to public health by recreating in, or using waters and shores affected by a discharge; and (e) Information for the public to subscribe to notifications about discharges in local area waters. Signage shall be developed using a template provided by the Department and be able to provide timely information about ongoing discharges to allow municipal boards of health and health departments to meet the requirements of 314 CMR 16.09(5). For discharges directly affecting neighborhoods identified as environmental justice populations due to lacking English language proficiency, signage shall provide access to translations in the language(s) most appropriate for those neighborhoods and shall utilize universal symbols.

16.09: Public Health Warnings (1) Boards of health or health departments in municipalities directly impacted by the discharge or overflow shall issue a public health warning to impacted residents of the municipality upon receipt of a public advisory notification if any of the following circumstances applies: (a) For CSO, partially treated, and blended wastewater discharges, if the discharge has a duration longer than two hours; (b) For CSO, partially treated, and blended wastewater discharges, if the board of health or health department determines that a public health warning is necessary to protect public health, regardless of the duration of the discharge; or (c) For any SSO that requires notification pursuant to 314 CMR 16.03(1)(c) through (e). (2) Boards of health and health departments shall issue the public health warning using existing emergency notification systems, including if available, a reverse 911 emergency call system. (3) When more than one discharge or overflow can occur on a waterbody, the boards of health or health departments shall determine whether the first public health warning is sufficient or whether additional public health warnings are required. (4) At a minimum, the public health warning shall identify receiving waters affected and shall include: (a) The location, date, and time of the discharge or overflow; (b) A recommendation that the public avoid contact with affected water bodies for at least 48 hours after a sewage discharge or overflow, and during rainstorms and for 48 hours after rainstorms end, due to increased health risks from bacteria or other pollutants associated with urban stormwater runoff and discharges of untreated or partially treated wastewater; (c) Information on where to find the closure or advisory status of shellfish growing areas, beaches, or other water resource areas potentially affected by the discharge or overflow; and (d) Access to translations of the warning, as appropriate for neighborhoods identified as environmental justice populations due to lacking English language proficiency, in the language(s) most appropriate for those neighborhoods. (5) When boards of health or health departments issue a public health warning, they shall also post or cause to be posted a temporary sign or use a permanent sign, at conspicuous locations affording public access to the waterbody, as identified by the board of health or health department, in municipalities directly impacted by the discharge or overflow. Temporary signage is not required at permitted bathing beaches or shellfish growing areas that are monitored and posted pursuant to Department of Public Health or Division of Marine Fisheries requirements. Permanent signs installed and maintained by permittees in accordance with 314 CMR 16.05(3) may be used for this purpose.

After you have a chance to review the requirements, please provide locations along the Merrimack or Spicket River, within your municipality, that are considered public access points for swimming, bathing, boating, or fishing that you believe should have signage. We are working on a design for the signs and are communicating with other wastewater facilities along the Merrimack to streamline this process as best we can. GLSD's Preliminary CSO Notification Plan is due to MassDEP on May 1st. If possible, please provide the locations ahead of this date. Once this list is finalized, we can discuss the design and installation of the signs over the summer.

Feel free to reach out to me with any questions.

Regards,



Cheri R. Cousens, P.E.
Executive Director
240 Charles St, North Andover, MA 01845-1649
Phone (978) 685-1612
Fax (978) 685-7790
info@glsd.org

From: [Cheri R. Cousens](#)
To: [Zemel, Felix](#); rmacdonald@cityofhaverhill.com; healthagent@grovelandma.com
Cc: [Michael Armano](#); [Brett Leavitt](#)
Subject: Locations for (CSO) Signage at Public Access Points along the Merrimack River
Date: Sunday, January 8, 2023 12:03:00 PM
Attachments: [image001.png](#)

Dear Health Official,

I hope you are well. GLSD is working on the Final Combined Sewer Overflow (CSO) Notification Plan and needs your input. This plan is due on Thursday of this week.

The regulations related to this request can be found at: <https://www.mass.gov/doc/314-cmr-1600-notification-requirements-to-promote-public-awareness-of-sewage-pollution-1/download>.

These regulations state that GLSD and other facilities that experience CSO's need to coordinate with representatives of Boards of Health and/or Health Agents on public signage. Specifically, Sections 16.05 CSO Permittee Website and Signage Requirements (3).

GLSD has determined that affected areas include the Merrimack River not only in Lawrence and Methuen (downstream of Great Stone Dam) but Haverhill and Groveland too.

Could you please provide locations along the Merrimack River, within your municipality, that are considered public access points for swimming, bathing, boating, or fishing that you believe should have signage and are affected by GLSD's CSO activity?

Feel free to reach out to me with any questions and I look forward to your response.

Regards,



Cheri R. Cousens, P.E.
Executive Director

 240 Charles St, North Andover, MA 01845-1649
 Phone (978) 685-1612
 Fax (978) 685 7790
 info@glsl.org

From: [Cheri R. Cousens](#)
To: [Michael Armano](#)
Cc: [Brett Leavitt](#)
Subject: Locations for Signs at Public Access Points Downstream of Dam in Lawrence
Date: Sunday, January 8, 2023 11:38:00 AM
Attachments: [image001.png](#)

Hello Mr. Armano,

I am working on GLSD's Final Combined Sewer Overflow (CSO) Public Notification Plan that is due at the end of this week. I have one final data need where your input will be very helpful.

As you are aware, GLSD has four CSO outfalls (four total – two on each bank below the dam) that discharge CSO into the Merrimack River during extreme precipitation events. Could you provide a list of public access points downstream of the Great Stone Dam that the public uses to access the Merrimack River for signage purposes?

GLSD also has one CSO outfall on the Spicket River adjacent to Lawrence General. Could you confirm whether there are any public access points downstream from that location?

GLSD will provide all signs in Lawrence in both English and Spanish. I was relying on MassDEP's map of access points but also want to make sure you provide input for the City. I greatly appreciate your assistance with this request and look forward to hearing from you.

Regards,



Cheri R. Cousens, P.E.
Executive Director
240 Charles St, North Andover, MA 01845-1649
Phone (978) 685-1612
Fax (978) 685 7790
info@glsd.org

APPENDIX E

INFORMATION ON SIGNAGE FROM BOARDS OF HEALTH WITHIN AFFECTED AREA

The City of Haverhill's Health Department provided the following locations that have public access to the Merrimack River within GLSD's affected area:

1. Public launch next to Washington's Landing Park at the foot of Ferry Street
2. The public docks behind the Tap
3. Next to the Water Street Fire Station
4. Abbots Marina Service, Boat Launch
5. River Rest Park, Boat Launch
6. Riverside Park, Canoe Launch, Fishing, Picnicking, Sport Facilities
7. Rivers Edge Park, Picnicking, Fishing, Sport facilities
8. Lighthouse Landing Marina, Boat Launch
9. Kazmiera Marina, Boat Launch
10. Crescent Yacht Club, Boat Launch
11. City Landing at Rock's Village, Canoe Launch, Fishing

APPENDIX F

**Memorandum by Kleinfelder Engineers dated March 28,
2023 regarding Affected Area Calculation**



MEMORANDUM

TO: Cheri Cousens, PE, Greater Lawrence Sanitary District
FROM: Dingfang Liu, PE, Kleinfelder
DATE : March 28, 2023
SUBJECT: GLSD Combined Sewer Overflow Affected Area Calculation Methodology
CC: Mark Thompson, PE, Kleinfelder; Brett Leavitt, GLSD

BACKGROUND

The Greater Lawrence Sanitation District (GLSD) has submitted a Preliminary Public Notification Plan pursuant to the requirements stated in Massachusetts Law 314 CMR 16.06(1). As part of that Plan, the intent of this memorandum is to describe the methodology applied to calculating the affected area caused by Combined Sewer Overflow (CSO) discharges from the combined sewer system to the receiving water bodies, including the Merrimack River. The affected area can be defined as the downstream extent of contamination in pathogen concentrations still above the State water quality limit. The CSO Public Notification Plan for the GLSD requires that populations within any affected area downstream of a CSO activation be notified of the risks associated with the contaminant release into the receiving waters. The Merrimack River is 117 miles long, has its headwaters in New Hampshire and flows southward into Massachusetts before traveling northeast, emptying into the Gulf of Maine at Newburyport, MA. Major communities that exist along the Merrimack River downstream of North Andover include Lawrence, Groveland, Haverhill, West Newbury, and Newburyport. Using the below methodology, estimates of affected area, particularly in reference to the communities along its length can be made.

DATA COLLECTION

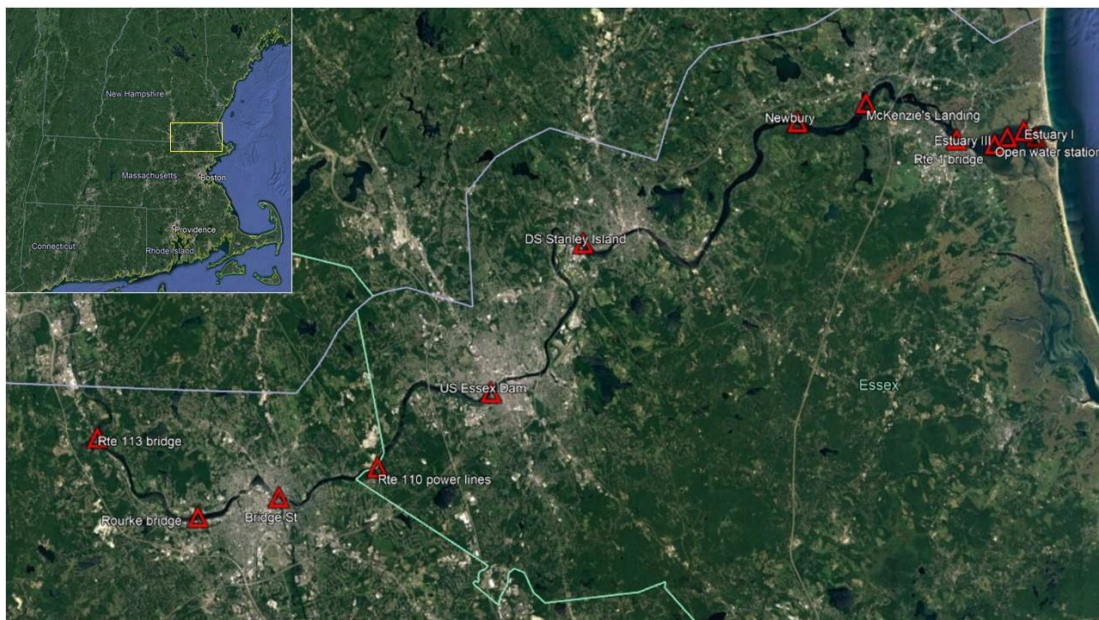
Grab Sampling. Grab sampling is used to characterize the pathogen concentration in the CSO discharge during overflow events. It is more representative than composite sampling for biological parameters because the holding time duration is much shorter. A grab sample is a discrete, individual sample collected over a maximum of 15 minutes. Grab samples represent the conditions at the time the sample is taken and do not account for variations in quality throughout a storm event. Grab sampling occurs as close as possible to the beginning of the discharge for more conservative results. Sampling is conducted using standard QA/QC protocols and procedures. Discharges from CSOs are sampled during several events and representative data is used to estimate concentrations in subsequent storm events by correlating the results.

EPA bacteria standard for Class B Water – Statistical Threshold Value (STV)

<i>E. Coli</i> STV	410	cfu/100mL
<i>Enterococcus</i> STV	130	cfu/100mL

Precipitation. Rainfall data are necessary to analyze the Combined Sewer System (CSS), calibrate and validate CSO models, and develop design conditions for predicting current and future CSOs. Rainfall data includes long-term rainfall records and data gathered at specific sites near the CSS. To ensure that data collection efforts are representative and conservative, events are selected for the affected area determination that displayed the highest ratio of CSO discharge volume to rainfall quantities.

Streamflow. Several USGS gaging stations exist along the Merrimack River. For determining the flow in the Merrimack River during the storm event, CSO release, and after the discharge, applicable published USGS gauging station data is used. Specifically stream gauges that are located at Lowell, Manchester, and Newburyport are used as part of the affected area calculations.



[Location map of the Massachusetts section of the Merrimack River | U.S. Geological Survey \(usgs.gov\)](https://www.usgs.gov)

CSO Discharge Data Collection. To measure discharge volumes, GLSD utilizes direct measurement/metering in which electronic instruments are installed at all CSO locations. The calculations are automated via GLSD’s SCADA system. The SCADA system provides real-time alerts for discharges which are continuously monitored by a Head Operator who confirms the overflow prior to initiating public notification. GLSD utilizes HACH WIMS programming as well as additional reporting technologies to aid in the creation of reports of recent high flow events.



List of Key Parameters:

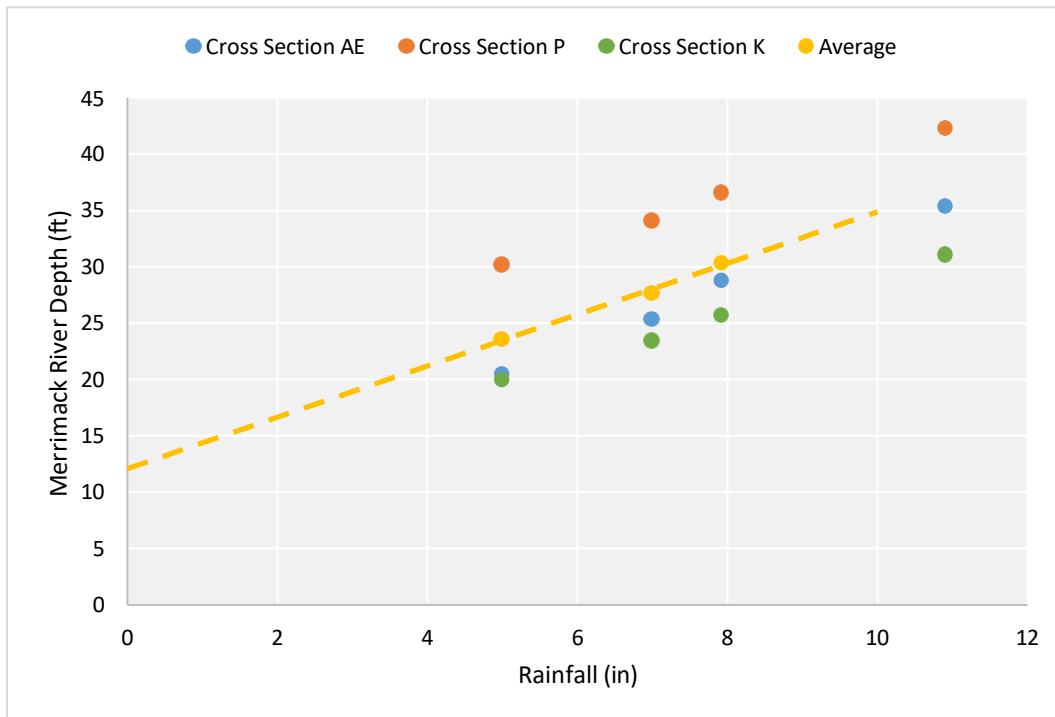
Parameter	Application
USGS stream Gaging Data	Instantaneous volume at time of discharge and over time and distance downstream.
Tributary drainage area for stream gauge	Incremental flow contribution as the release moves downstream
Local precipitation data	Correlating event with CSO discharge quantity
CSO discharge data	Volume of discharged combined sewage
Actual and correlated pathogen concentration data	Determine initial concentrations at discharge
Regulatory Limits of <i>E. Coli</i> and <i>Enterococci</i>	The point at which parameters are met determines the extent of affected area.

DETERMINING AFFECTED AREA

The affected area is determined by an analysis of River flow during wet weather, CSO discharge volumes and pathogen concentrations. Historical and real time USGS stream gaging data and rainfall data are used to determine the typical river flow conditions during CSO activation to estimate the extent of downstream impact.

Streamflow is determined both upstream and downstream of North Andover from published real time USGS river gauge data. The tributary land area for each USGS stream gauge is an additional important factor in the analysis. River flow during the weather event is correlated to the tributary area of the USGS gauge to determine contribution of flow per square mile of tributary area (cfs/mi²) during the event. Each square mile of tributary area aggregated between USGS stream gauges generate an incremental increase of additional flow; this factor was used to calculate the increase in volume and velocity moving downstream along the river from North Andover to Newburyport (additional cfs/ft of river travelled).

Average river width and depth (820 and 17.65ft respectively) were applied to calculate the volume in a theoretical 1-foot-wide cross section of the river. Cross section dimensions were determined using the FEMA Flood Insurance Study (FIS) for the Merrimack River. Three representative cross sections downstream of the GLSD outfall were selected, and the modeled river depths from the FIS were used to develop a rainfall and river depth relationship. Dimensions were chosen based on rainfall measured during a CSO event on September 9, 2021.



Representative cross-section depths from Merrimack River FIS used to determine affected area calculation parameters.

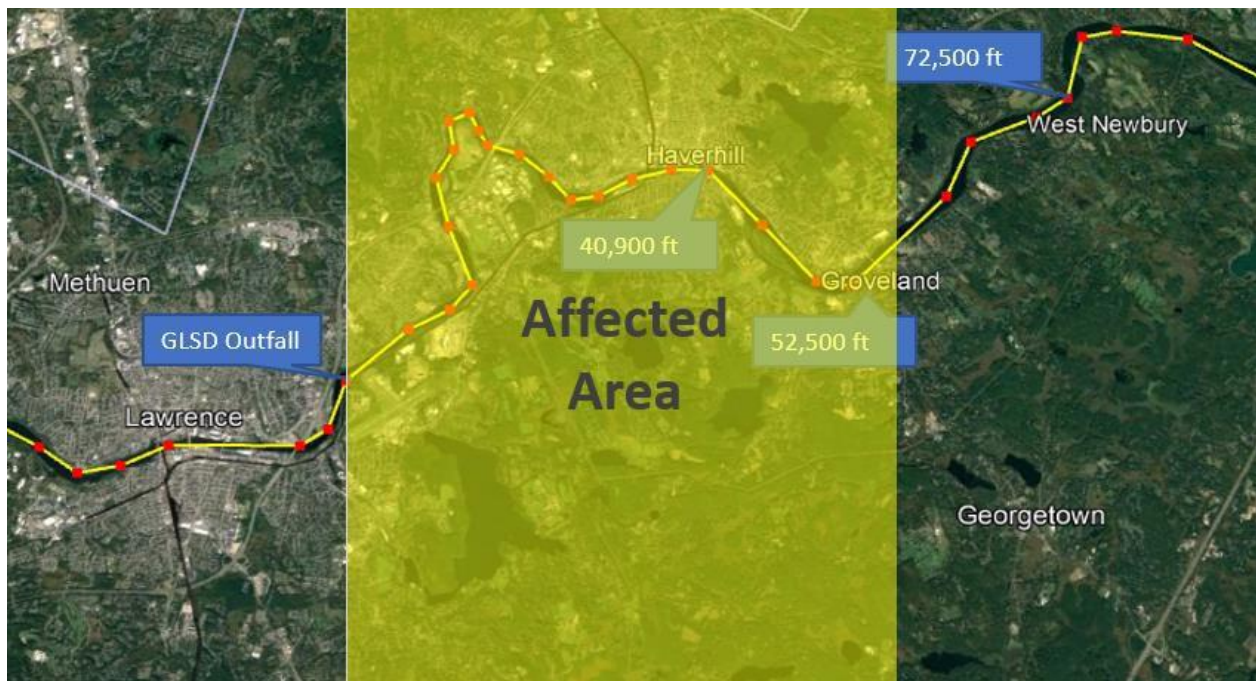
A dilution factor based on standard methodologies published by EPA⁴ and pathogen grab sample concentration data from the CSO is applied both to the cross section, and as volume increases as it moves in the downstream direction. Grab sample concentration data from GLSD were within the standard deviation of published typical values from other comparable facilities (MWRA’s Prison Point and Cottage Farm facilities).

Using the USGS discharge data (cfs) applied to this theoretical cross section can result in an estimate of average river velocity (fps). River velocity is required to determine the time taken for the discharge to travel a given distance; this is important because a pathogen die off rate is applied which in addition to the incremental increase in flow and resulting dilution, will contribute to further dilution of pathogens in the water. This pathogen die off rate is calculated based on EPA methodologies³ and principles of Chick’s and Watson’s Law¹ which is a standard method that describes the deactivation of microbes over time. The point in time the pathogen concentration reaches the Massachusetts State standard can be correlated with a distance downstream of the discharge by factoring the velocity of the river; this distance defines the extent of the affected area.

Affected Area Calculation Tool. An Excel-based tool has been developed that provides a simple means to determine the affected area with minimal input of variables. The tool will be updated on a regular basis as data is collected over time.

RESULTS

To conservatively estimate the affected area of an CSO event, the highest reported CSO volume (35.04 MG) was incorporated into the calculation. Additionally, a conservative concentration estimate for E. Coli was used based on historic (2017-2020) MWRA data for raw sewage (mean E. coli count -134,000 MPN/100mL) and Enterococci concentration (mean Enterococci count - 39,000 MPN/100mL). Flows in the Merrimack River on the day the CSO was reported were obtained from online USGS records (~12000 cfs). A pathogen die-off rate of $0.8d^{-1}$ was used. Here, dilution factor is calculated based on flow volumes for the selected combined sewer overflow event and the river flow and stages during the event. For example, CSO volume of 30 million gallons (4 million cubic ft) and river cross section area of (6,000 sq. ft), would provide a dilution factor of 1.50 for a 1000 linear ft river length. Using the methodology described in this memorandum, an estimate of the Affected Area due to a CSO release from the GLSD facility has been calculated as extending to the Town of Groveland (60,467 linear feet along the Merrimack River). The calculation assumes typical high flow condition in the river during a CSO release based on the 9/2/2021 CSO event as well as grab sample concentration data.



Resulting affected area downstream of the GLSD outfall.



References:

1. [Chick's law and Watson's law - law for disinfection \(brainkart.com\)](http://brainkart.com)
2. [Tech notes 9 dec 2013 pathogens.pdf \(epa.gov\)](http://epa.gov)
3. [2004 EPA CSO SSO Report to Congress: Appendix H Estimation of SSO Impacts in Streams and Rivers](#)
4. MWRA; Task 4: Semiannual CSO Discharge Report No. 6 July 1, 2020 – December 31, 2020; https://www.mwra.com/cso/pcmpa-reports/06_070120-123120.pdf

APPENDIX G

Combined Sewer Overflow Final Public Notification Plan

Massachusetts Department of Environmental Protection
Bureau of Water Resources – Wastewater Management Program
Combined Sewer Overflow Final Public Notification Plan

1. Facility Information

Important: When filling out forms on the computer,

use only the tab key to move your

cursor - do not use the return key.



Greater Lawrence Sanitary District
Name of Permittee (Facility or System)

Brett Leavitt
Permittee Contact Name

bleavitt@qlsd.org
Email Address

978-685-1612
Phone number

240 Charles Street, North Andover, MA 01845
Permittee Mailing Address

MA 0100447
NPDES Permit #

System contains (check all that apply):

- Collection system Pump station(s) above 1MGD Wastewater treatment plant

Location of WWTP discharge, if applicable: Merrimack River

Attach a map with locations of discharges and affected waterbodies. Include other supporting information as needed.

2. Identification of Environmental Justice Populations

Are there Environmental Justice (EJ) populations that would potentially be affected by your wastewater treatment plant discharge(s) or a combined sewer overflow? See the Instructions file for more detail. Yes No

If there are EJ populations that would potentially be affected, do 25% or more of households lack English-language proficiency, and at least 5% of the population self-identify as “do not speak English very well”? See the Instructions file for more detail. Yes No

Provide a list of all languages that notifications will be translated into:

Spanish

Attach a description of how translations of public advisory notification and signage required by these regulations will be provided to EJ populations in the languages listed above. Include:

- A description of the third party or internal resource used to produce the translations
 A description of how the translation will be accessed by a public advisory notification recipient
 A description of how the translation will be accessed by someone reading the signage at

CSO outfalls and public access points

3. Discharges, Overflows, and Public Notification Content

When public notification is required: (check box to affirm)

- Permittee is aware that all events covered under 314 CMR 16.03(1)(a-e) require a public notification.

Required content of public notification: (check box to affirm)

Permittee is aware of all required information for public notifications under 314 CMR 16.04(10)

Massachusetts Department of Environmental Protection
Bureau of Water Resources – Wastewater Management Program
Combined Sewer Overflow Final Public Notification Plan

Attach a description of how the permittee will meet the requirements under 314 CMR 16.04(10), including the following:

- How the permittee will determine or discover that an event has occurred
- How the permittee will estimate the volume of discharges or overflows
- How the permittee will estimate the commencement times, cessation times, and duration of discharges or overflows
- A list of the waters and land areas affected by the permittee's discharges or overflows

Permittee can meet all requirements of 314 CMR 16.04(10) Yes No

If no, please describe in detail which components the permittee is not able to meet and the measures needed to comply. Include a schedule for compliance.

Components that cannot be met

Schedule for compliance

4. Discovery and Required Timeline for Notification Following Discharge or Overflow

Requesting approval of an alternative method:

Is the permittee requesting approval to use a method other than metering to detect a discharge? (Requires approval of MassDEP Commissioner) Yes No

If yes, **attach** additional information on the method to detect a discharge

If yes, **attach** a letter to the Commissioner with the approval request

Discovery of a Discharge or Overflow:

Attach a description of the steps the permittee will take to determine or discover that a discharge or overflow from its outfall or sewer system is occurring

Can the permittee discover an event under 314 CMR 16.04(5)(a), (b) & (c) within the required timeline? Yes No

If no, **attach** a description specifying the limitations to meeting these requirements and potential remedies. Include and a schedule for implementing potential remedies.

Issuance of Public Notification:

Permittee can meet the notification requirements in 314 CMR 16.04(4) to notify as soon as possible, but no later than two hours after discovery. Yes No

If no, **attach** a description specifying the limitations, potential remedies, and a schedule for implementing potential remedies.

If no, **attach** a letter to the Commissioner requesting approval for a longer time period for notification.

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Continuation of Public Notification:

Permittee can meet the notification requirements in 314 CMR 16.04(7) to issue an update 8 hours after the public advisory notification, if the initial notification does not indicate that the event has ceased. Yes No

If no, **attach** a description of which requirement cannot be met, what measures are needed for compliance, and a schedule for compliance.

Cessation of Public Notification:

Permittee can meet the notification requirements in 314 CMR 16.04(8) to continue issuing 8 hour updates for ongoing events, and notify within 2 hours of when the event ceases or is projected to cease. Yes No

If no, **attach** a description of which requirement cannot be met, what measures are needed for compliance, and a schedule for compliance.

Retraction of Public Notification:

Permittee can meet the notification requirements in 314 CMR 16.04(9) to issue a retraction if the permittee becomes aware within 48 hours of issuing the public advisory notification that no discharge or overflow actually occurred. Yes No

If no, **attach** a description of which requirement cannot be met, what measures are needed for compliance, and a schedule for compliance.

5. CSO Permittee Website

Does the permittee/sewer authority have an existing website or web page where relevant information is posted? Yes No

If yes, provide the URL:

<https://www.glsd.org>

Describe the subscriber-based system where the public can sign up to receive your notifications.

Everbridge, a software provider, offers applications to inform recipients on critical events.

Permittee's website is able to meet the requirements under 314 CMR 16.04(3) Yes No

Permittee's website is able to meet the requirements under 314 CMR 16.05(1)(a-e) Yes No

If any website requirements can not be met, specify limitations to meeting these requirements, potential remedies, and a schedule for compliance:

Attach a description of how the Permittee will update the website with requirements under 314 CMR 16.04(3) and 314 CMR 16.05(1)(a-e)

6. Signage

Permittee has consulted with the Board of Health/Health Departments in municipalities affected by their discharges for public access sign location points as required by 314 CMR 16.05(3)? Yes No

Attach a list of locations where signs will be installed and dates when signs will be installed.

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Permittee is able to meet the signage requirements under 314 CMR 16.05(2)? Yes No

If no, specify limitations to meeting these requirements, potential remedies, and a schedule for compliance:

Permittee is able to meet the signage requirements under 314 CMR 16.05(3)? Yes No

If no, specify limitations to meeting these requirements, potential remedies, and a schedule for compliance:

7. Public Notification Recipients

Media Outlets

List the two media outlets serving the area near the discharge or outfall that the permittee will contact to provide a public notification. Include name of organization, name of contact, and contact's email address or fax number.

Lawrence Eagle Tribune, William Broaddus, wbroaddus@eagletribune.com

Name of media outlet #1

Boston Herald, Meghan Ottolini, meghan.ottolini@bostonherald.com

Name of media outlet #2

If permittee has determined that an EJ population could potentially be affected by a discharge or overflow, which of these media outlets serves the EJ population? If neither does, then provide at least one additional news organization that primarily serves the EJ population(s) within the impacted municipalities. (Include name of organization, name of contact, and contact's email address or fax number.)

Rumbo, Dailia Diaz, daliadiaz@rumbonews.com

Name of additional media outlet serving EJ population if neither media outlet above serves EJ population

Attach a description explaining how the identified media outlets serve potentially affected EJ populations.

See Instructions for list of **Required Public Notification Recipients** (314 CMR 16.04(4)(a)).

Attach a list of your required contacts.

8. Detection method maintenance

If metering is used, will the Permittee perform the requirements in 314 CMR 16.06(2)(b) below?

Calibrate metering equipment on an annual basis, at minimum Yes No

Properly maintain metering equipment Yes No

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If models are used and approved, will the Permittee perform the following requirements in 314 CMR 16.06(2)(d) below?

- | | | |
|---|------------------------------|-----------------------------|
| Review and update the model input data as needed | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Maintain any data collection equipment providing critical input to the model | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Assess model predictions annually, at a minimum | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Provide a description of actions taken in writing on or before March 1 st of each year | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

9. Public Notice

Submit a public notice to the Environmental Monitor at the same time this plan is submitted to MassDEP. Indicate below that the permittee will submit the public notice as follows:

- Email the public notice to MEPA@mass.gov at the same time the plan is submitted to MassDEP
- Include in the body of the email, "Please publish the attached public notice as 'Notice of Combined Sewer Overflow (CSO) Final Public Notification Plan.'"
- Attach the public notice to the email as a PDF
- Permittee will place a public notice in at least one media outlet that serves the EJ population(s) in the municipalities impacted by the discharge. Indicate media outlet(s) below:
Rumbo News, Dalia Diaz, daliadiaz@rumbonews.com

Include the following in the Public Notice, required under 314 CMR 16.06(2):

- A statement that a CSO Public Notification Plan has been prepared and submitted to the Department
- A link to a website where an interested party can review the plan
- A statement that written comments on the plan can be submitted to MassDEP and the permittee for a period of 30 days after the date of publication in the Environmental Monitor or media outlet, whichever date is later. Explicitly list the end date for submission of public comments
- Translations of the Public Notice in languages most appropriate for neighborhoods within the impacted municipalities that are identified as environmental justice populations due to lacking English language proficiency

Certification

I attest that I have examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certifying statement. The information contained in this submittal is, to the best of my knowledge, true, accurate, and complete. I am fully authorized to make this attestation on behalf of the facility.

<u>Brett Leavitt</u>	<u>Operations Manager</u>
Print Name	Title
<u><i>Brett Leavitt</i></u>	<u>1/11/2023</u>
Signature	Date