

## **Braintree IDDE Memo – April 2022**

**Date:** June 30, 2022

**To:** James Arsenault, Director of Public Works

**From:** Hillary Waite, Stormwater Manager

**Re:** April 2022 Dry Weather Screenings

### **Introduction**

The Stormwater Division has an active illicit discharge detection and elimination (IDDE) program that seeks to identify and remove illicit discharges to the Town's stormwater system. This program includes dry weather screening and sampling at the Town's stormwater outfalls. Technical Memorandum 1 (Brown and Caldwell, September 24, 2019) provides a summary of previous IDDE investigations. Technical Memorandum 1 identified four stormwater outfalls that are suspected of sewage contamination<sup>1</sup>:

- MQR-002/OF-13
- MQR-005/OF-8
- CDS-010/OF-122
- MQR-003/OF-314

In 2019, all four of these outfalls had dry weather discharges with E. Coli concentrations in excess of the state standard (235 cfu/100 ml). In response to the elevated E. Coli concentrations, follow-up investigations were performed in the Spring of 2020. Technical Memorandum 2 (Brown and Caldwell, August 5, 2020) summarized those follow-up investigations and recommended ongoing screening at these outfalls. At that time, Brown and Caldwell recommended returning to these outfalls at 6-month intervals for screening to continue to evaluate for potential presence of illicit discharges. This Memorandum provides a summary of screenings conducted in April 2022.

### **Procedures**

Dry weather screening and outfall sampling was performed by Town employees in accordance with the Town's Outfall Inspection and Dry Weather Sampling SOP (Town of Braintree IDDE Plan, June 2019). In accordance with the dry weather screening and outfall sampling procedures, water quality samples were collected from the outfalls with flow present and sent to the laboratory to be analyzed for E. Coli bacteria. Additionally, concentrations of ammonia, surfactants, and chlorine were measured in the field using field test kits.

Because bacteria concentrations cannot be determined in the field, the determination of the potential for sewage contamination was initially made in the field based on visual and olfactory observations and

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<sup>1</sup> All outfalls have two ID numbers. Numbers that begin with "OF" are the outfall numbers from the Town's asset management software. Numbers that begin with three letters (e.g. MQR, CDS) reference their receiving water (i.e. Monatiquot River, Cedar Swamp respectively) and are IDs given by Brown and Caldwell during the original IDDE screenings. In general going forward we plan to refer to outfalls by both ID numbers whenever possible.

field test kit measurements. The bacteria data is reviewed after it is received from the laboratory to make a final determination as to the likelihood of sewage contamination at the outfall.

Generally, if field test kits show potential for sewage contamination, upstream investigations can be conducted immediately to attempt to identify discharges from episodic or intermittent illicit sources. Due to a number of factors, the Stormwater Division elected not to perform these upstream investigations immediately, and instead plans to secure the services of a consultant to assist with further investigation. These factors included:

- Planned use of a consultant to investigate these outfalls
- Planned smoke testing in these catchments for autumn 2022
- Limited staff capacity

## Results

The table below shows the results of the screenings. Field screenings were conducted for temperature, salinity, conductivity, pH, ammonia, surfactants, and chlorine. Samples were transported to G&L Labs, Quincy, for screenings for fecal coliform, *E.coli*, and enterococcus.

A description of each outfall's screening and results follows.

Outfall ID	Date screened	Precipitation in prior 48hr (in)	Temperature (degrees F)	Salinity	pH	Ammonia (mg/L)	Surfactants (mg/L)	Total Chlorine (mg/L)	Fecal Coliform (CFU/100mL)	E.coli (CFU/100mL)	Enterococcus (CFU/100mL)
MQR-002/ OF-13	4/5/22	0.01	54	0.387	6.61	0	0.25	1.68	<10	<10	<10
MQR-005/ OF-8	4/5/22	0.01	57	0.374	7.83	0	0.25	0.3	250	70	110
CDS-010/ OF-122*	4/13/22	0	52	0.004	6.9	0.1	0.25	1.8	<10	<10	<10
MQR-003/ OF-314**	4/13/22	0	61	0.936	6.5	0.6	0.25	0	11,000	2700	1900

\*Screened at DMH-1623

\*\*Screened at SWIN-2600

### **MQR-002/OF-13**

This outfall is located on the North Bank of the Monatiquot River in the bridge abutment of Quincy Avenue (Route 53) and was screened on April 5, 2022. The outfall is located in the side of the bridge and flows down into a small pool that drains into the Monatiquot River. This outfall is visible from the bridge and is suspected to only being influenced by tidal waters during astronomically high tides. The invert elevation of the pipe is just below the elevation of the underside of the bridge.

Sewage indicators were present in field tests (surfactants, chlorine) but not in lab tests.

Additional upstream investigation is scheduled for Summer-Fall 2022 (Weather permitting, July-December).

This outfall receives significant discharge from Quincy Ave and MassDOT structures, and additional investigation of the MassDOT MS4 may be required to eliminate discharges.

### **MQR-005/OF-8**

This outfall is located on the North Bank of the Monatiquot River near the intersection of Shaw Street and Allen Street and was screened on April 5, 2022. The outfall does not have a headwall. It consists of a steel pipe that sticks out into the river near the bridge on Shaw Street. This outfall is visible from the bridge and is suspected of being influenced by tidal waters only during astronomically high tides. The invert elevation of the pipe is just below the elevation of the underside of the bridge.

Sewage indicators were present in field tests and in lab screenings.

Additional upstream investigation is scheduled for Summer-Fall 2022 (Weather permitting, July-December).

### **CDS-010/OF-122**

This outfall is located behind the house at 32 Linda Road and was screened on April 13, 2022.

The outfall is accessed via a footpath adjacent to the house at 30 Alida Road. The outfall is partially submerged and has significant sediment deposits in the scour pool. The outfall discharges to a low-lying wetland area behind the residences. This outfall is only visible from the heavily wooded area behind Linda Road and Alida Road.

Since CDS-010 was submerged at the time of inspection, the water quality sampling and field test kits were performed at an upstream manhole, SWDMH-1623. There was no visual or olfactory evidence of sewage contamination. Field test kits were not performed at the outfall because discoloration of the water made it difficult to interpret the field test kit results.

The field test kits indicated the potential presence of sewage in the catchment. Lab screenings did not indicate high bacteria, but the Division will continue to monitor the outfall.

Additional upstream investigation of this catchment is scheduled for Summer-Fall 2022 (Weather permitting, July-December).

## **MQR-003/OF-314**

Source tracking was previously performed upstream of MQR-003 in 2019 and 2020. During previous inspections (see Technical Memorandum 1, Brown and Caldwell, September 24, 2019), this outfall was suspected of having sewage contamination from a privately-owned surcharging sanitary manhole on Crescent Avenue, just upstream from the outfall. The Town had previously contacted the property owner to resolve the contamination. The 2020 follow-up inspection found no signs of sewage contamination from the sanitary manhole to the storm drain catch basin inspections (see Technical Memorandum 2, Brown and Caldwell, August 5, 2020).

Source tracking in 2020 found stormwater flow in the manhole in the intersection of Hancock Street and Frederick Road. Further investigation indicated that the illicit source is located somewhere between the manhole at Hancock Street/Frederick Road and the stormwater outfall.

In November 2020, the Town identified the suspected source of the discharge. Effluent from joints in the sanitary sewer line was leaking into the drain line at this location. CCTV and dye testing identified the source of the leaking. The Water and Sewer Division lined this section of sanitary sewer with cured-in-place pipe on May 28, 2021.

Confirmatory screening was conducted on April 13, 2022. The outfall was not accessible, so Town staff screened the catch basin upstream of the outfall, SWIN-2600. Screening indicated that sewage was still present in the catch basin's flow (fecal coliform at 11,000CFU/mL), potentially at a higher level than during the 2020 screenings. It is possible there is another illicit source in this catchment.

Additional upstream investigation of this catchment is scheduled for Summer-Fall 2022 (Weather permitting, July-December). The Stormwater Division intends to schedule the associated stormwater lines for cleaning and jetting prior to upcoming screenings.

## **Conclusions**

Stormwater outfall screening and sampling was performed in April 2022 at four outfalls that were previously suspected of sewage contamination. The results indicate that all four outfalls may still have sewage contamination at the time of inspection. The Stormwater Division plans to secure the services of a consultant to assist with locating the illicit discharges.

Further screening and investigation is scheduled for July-December 2022 as weather permits. The Division plans to contract with a consultant, Stacey DePasquale Engineering, Inc., to locate potential sources of ongoing illicit discharges.

For MQR-003, potential residual contamination may exist from the leaching sewer line (now lined). The Division will plan to clean the stormwater pipe and sample again prior to source tracking.